IBM Tivoli System Automation for z/OS

Planning and Installation

Version 3 Release 1

SC33-8261-01

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Note!
Before using this information and the product it supports, be sure to read the general information under "Notices" on page xi.

Second Edition (September 2005)

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Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS™ enable users to:

- Use assistive technologies such as screen readers and screen magnifier software
- Operate specific or equivalent features using only the keyboard
- Customize display attributes such as color, contrast, and font size

Using assistive technologies

Assistive technology products, such as screen readers, function with the user interfaces found in z/OS. Consult the assistive technology documentation for specific information when using such products to access z/OS interfaces.

Keyboard navigation of the user interface

Users can access z/OS user interfaces using TSO/E or ISPF. Refer to *z/OS TSO/E Primer*, *z/OS TSO/E User's Guide*, and *z/OS ISPF User's Guide Vol I* for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

z/OS information

z/OS information is accessible using screen readers with the BookServer/Library Server versions of z/OS books in the Internet library at:

`http://www.ibm.com/servers/eserver/zseries/zos/bkserv/`

About This Book

This book describes IBM® Tivoli® System Automation for z/OS (SA z/OS) from a planning point of view, and how to install the product.

Who Should Use This Book

This information is intended primarily for system programmers and automation programmers who plan for systems management and who install this product.

Notes on Terminology

MVS:
References in this book to "MVS™" refer either to the MVS/ESA™ product or to the MVS element of z/OS.

NetView:
The term *NetView®* used in this documentation stands for *IBM Tivoli NetView for OS/390®*.

Where to Find More Information

The System Automation for z/OS Library

The following table shows the information units in the System Automation for z/OS library:

Table 1. System Automation for z/OS Library

Title	Order Number
IBM Tivoli System Automation for z/OS Planning and Installation	SC33-8261
IBM Tivoli System Automation for z/OS Customizing and Programming	SC33-8260
IBM Tivoli System Automation for z/OS Defining Automation Policy	SC33-8262
IBM Tivoli System Automation for z/OS User's Guide	SC33-8263
IBM Tivoli System Automation for z/OS Messages and Codes	SC33-8264
IBM Tivoli System Automation for z/OS Operator's Commands	SC33-8265
IBM Tivoli System Automation for z/OS Programmer's Reference	SC33-8266
IBM Tivoli System Automation for z/OS CICS Automation Programmer's Reference and Operator's Guide	SC33-8267
IBM Tivoli System Automation for z/OS IMS Automation Programmer's Reference and Operator's Guide	SC33-8268
IBM Tivoli System Automation for z/OS TWS Automation Programmer's Reference and Operator's Guide	SC23-8269
IBM Tivoli System Automation for z/OS End-to-End Automation Adapter	SC33-8271

The System Automation for z/OS books are also available on CD-ROM as part of the following collection kit:

IBM Online Library z/OS Software Products Collection (SK3T-4270)

SA z/OS Home Page

For the latest news on SA z/OS, visit the SA z/OS home page at http://www.ibm.com/servers/eserver/zseries/software/sa

Related Product Information

You can find books in related product libraries that may be useful for support of the SA z/OS base program by visiting the z/OS Internet Library at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

Using LookAt to look up message explanations

LookAt is an online facility that lets you look up explanations for most of the IBM messages you encounter, as well as for some system abends and codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can use LookAt from these locations to find IBM message explanations for z/OS elements and features, z/VM®, VSE/ESA™, and Clusters for AIX® and Linux™:

- The Internet. You can access IBM message explanations directly from the LookAt Web site at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/.
- Your z/OS TSO/E host system. You can install code on your z/OS or z/OS.e systems to access IBM message explanations using LookAt from a TSO/E command line (for example: TSO/E prompt, ISPF, or z/OS UNIX® System Services).
- Your Microsoft® Windows® workstation. You can install LookAt directly from the *z/OS Collection* (SK3T-4269) or the *z/OS and Software Products DVD Collection* (SK3T4271) and use it from the resulting Windows graphical user interface (GUI). The command prompt (also known as the DOS > command line) version can still be used from the directory in which you install the Windows version of LookAt.
- Your wireless handheld device. You can use the LookAt Mobile Edition from http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookatm.html with a handheld device that has wireless access and an Internet browser (for example: Internet Explorer for Pocket PCs, Blazer or Eudora for Palm OS, or Opera for Linux handheld devices).

You can obtain code to install LookAt on your host system or Microsoft Windows workstation from:

- A CD-ROM in the *z/OS Collection* (SK3T-4269).
- The *z/OS and Software Products DVD Collection* (SK3T4271).
- The LookAt Web site (click **Download** and then select the platform, release, collection, and location that suit your needs). More information is available in the LOOKAT.ME files available during the download process.

Part 1. Planning

This part provides details on the following:

Chapter 1. SA z/OS Prerequisites and Supported Equipment

SA z/OS Components

SA z/OS consists of the following three components:

- system operations (*SysOps* for short)
- processor operations (*ProcOps* for short)
- I/O operations (*I/O Ops* for short)

Refer to "Component Description" on page 33 for details.

SA z/OS also provides special automation facilities for the following products:

- CICS®
- DB2®
- IMS™
- TWS

Hardware Requirements

IBM has tested SA z/OS on IBM processors. SA z/OS uses the S/390® interfaces that vendors of other processors capable of running z/OS have stated that they support. Check with your vendor for details.

The target system can run in any hardware environment that supports the required software.

SA z/OS Processor Operations

The processor operations base program can run on any processor supported by NetView 1.4.

SA z/OS System Operations

The system operations base program can run on any processor supported by NetView 1.4 and z/OS 1.4.

SA z/OS I/O Operations

The I/O operations base program can run on any processor supported by z/OS 1.4.

Note: If an ESCON® channel has not been installed and defined, I/O operations recovers from an ABEND 0C1, issues message IHVD014E, and terminates startup.

Workstation Components

The NMC exploitation used by SA z/OS can run on all NMC topology server and NMC topology client hardware that is supported by Tivoli NetView for OS/390 Release 4.

Functional Prerequisites

The hardware interface functions used by the INGPLEX command and the IXC102A message automation without processor operations is supported by the following processor hardware families:

- zSeries®
- CMOS-S/390 G6
- CMOS-S/390 G5

For current information about the LIC levels that are required for these servers, refer to the PSP bucket.

The following processor hardware can be controlled as a target with the BCP internal interface of the above listed processors, but cannot use the SA z/OS BCP internal interface to control itself or other processors:

- CMOS-S/390 G4
- CMOS-S/390 G3

The following micro code levels must be applied to all HMCs and SEs:

Processor Hardware	Micro Code Levels
CMOS-S/390 G3, G4	Driver A2 F10980.083
CMOS-S/390 G5, G6	Driver 26 F99918.152
zSeries z800, z900	Driver 3G J11213.154 Driver 3C J10638.116
zSeries z990	Driver 52 J12560.090

These MCL levels are required for all HMCs that serve as Master HMCs and have the LIC change console service enabled. Note that at least one HMC in your processor LAN configuration must have this service enabled in order to provide cross-CPC communication over the BCP internal interface.

Note: A number of hardware commands are not supported when running on a z/OS image that runs under z/VM. Refer to*IBM Tivoli System Automation for z/OS Customizing and Programming* for information about which particular functions are affected.

Software Requirements

This section describes the environment of the target system required to install and use SA z/OS.

Notes:

1. To properly invoke the Japanese language version of SA z/OS, a Japanese language version of NetView must be installed and the Kanji support must be enabled. For Kanji workstation support a Japanese language host must be

connected to a Japanese language workstation. If an English language workstation is connected to a Japanese language host some messages may be unreadable.

2. Check with IBM Service for required product service levels in addition to the base product releases. Certain service levels may be required for particular product functions.
3. SA z/OS processor operations is enabled on a focal-point system, from which it monitors and controls SA z/OS processor operations target systems. The SA z/OS processor operations target system may also have SA z/OS installed for its system operations and I/O operations but the processor operations will not be enabled. This section does not describe the SA z/OS Processor Operations target system.

Unless otherwise noted, subsequent versions or releases of products can be substituted.

Mandatory Prerequisites

A mandatory prerequisite is defined as a product that is required without exception; this product either *will not install* or *will not function* unless this requirement is met. This includes products that are specified as REQs or PREs.

Table 2. Mandatory Prerequisites

Product Name and Minimum VRM/Service Level
z/OS 1.4
Tivoli NetView for OS/390 Release 4

Functional Prerequisites

A functional prerequisite is defined as a product that is *not* required for the successful installation of this product or for the basic function of the product, but *is* needed at run time for a specific function of this product to work. This includes products that are specified as IF REQs.

Table 3. Functional Prerequisites

Product Name and Minimum VRM/Service Level	Function
z/OS base elements or optional features:	
z/OS SecureWay® Security Server (including RACF® and DCE Security Server components)	For sysplex-based authorization and RACF-based NetView authorization.
Other program products:	
WebSphere® MQ Version 5 Release 3	For sysplex automation and for communication between the automation manager and the automation agents.
HTML Browser	For customization reports. To view the HTML file with an Internet Browser, either Microsoft Internet Explorer 5.50 or above, or Netscape 4.72 or above.
z/VM 4.3	For VM Second Level Systems support.
IBM Tivoli OMEGAMON II® for MVS V5R2 IBM Tivoli OMEGAMON II for CICS V5R2 IBM Tivoli OMEGAMON II for IMS V5R1 IBM Tivoli OMEGAMON II for DB2 V5R4	For the following commands: • INGMTRAP • INGOMX
Workstation Prerequisites:	

Table 3. Functional Prerequisites (continued)

Product Name and Minimum VRM/Service Level	Function
Tivoli NetView for OS/390 Release 4 or later MultiSystem Manager	For SA z/OS topology manager functions
NetView Management Console topology server and client	For the SA z/OS NMC workstation exploitation
NetView 3270 Management Console	For the SA z/OS NMC workstation exploitation

Supported Hardware

SA z/OS processor operations supports monitoring and control functions for any of the following processors:

- zSeries and 390-CMOS processors
- All CMOS processors supporting Operations Command Facility (OCF) not part of the above processor families are supported by processor operations with limited functionality.

SA z/OS processor operations also supports logical partitioning of any of those processors.

SA z/OS provides a wide range of I/O configuration information and control functions for various types of hardware other than processors, though it does not require any of them. The hardware can include channels, control units and devices (both ESCON and non-ESCON), ESCON Directors (they are not required), and hardware used for sysplex coordination such as coupling facilities and External Time Reference (ETR) devices.

Operator Terminals

SA z/OS supports any display supported by Tivoli NetView for OS/390 Release 4. This is required for access to SA z/OS system operations and processor operations functions through NetView.

SA z/OS supports any display supported by ISPF 4.2 or higher. This is required for access to SA z/OS I/O operations functions and the SA z/OS customization dialogs.

Operating Systems Supported by Processor Operations

SA z/OS processor operations monitors and controls target systems with the following operating systems:

- z/OS, OS/390, MVS/ESA, MVS/XA™ (MVS/SP™ 2.2 or higher), z/VM
- VM/SP 6.0, VM/XA 2.1, VM/ESA® 1.1.0
- VSE/SP 4.1, VSE/ESA 1.1.0 or higher
- LINUX of distributions providing Linux for zSeries and S/390 support

Note: The above products may no longer be serviced.

Supported Software

Integrated automation for the following products is supported:

Table 4. Supported Software

CICS TS Version 1.3 CICS TS Version 2.1 CICS TS Version 2.2 CICS TS Version 2.3 CICS TS Version 3.1	For integrated automation of CICS address spaces.
IMS Version 7 IMS Version 8 IMS Version 9	For integrated automation of IMS address spaces.
Tivoli Workload Scheduler for z/OS Version 8.1 Tivoli Workload Scheduler for z/OS Version 8.2	For integrated automation of TWS address spaces.
DB2 Version 7 DB2 Version 8	For integrated automation of DB2 address spaces.

Customization Dialog Considerations

The SA z/OS customization dialogs do not provide National Language Support (NLS) in the ISPF environment. The SA z/OS customization dialogs must be used with a terminal type of 3278. The terminal type can be set in the Terminal Characteristics portion of the ISPF settings panel.

Chapter 2. What Was New in SA z/OS 2.3

This chapter contains an overview of the major changes to SA z/OS for Version 2 Release 3.

Changed Conceptual Product Behavior

This section introduces the most important changes in the behavior of the product in comparison to earlier releases.

Gateway Modernization

Instead of using a NetView to NetView session for communicating between a target system and the SDF focal point, SA z/OS 2.3 uses either the cross-system coupling facility (XCF) or the NetView RMTCMD command. XCF is used when both the target system and the focal point system are within the same sysplex, otherwise the NetView RMTCMD command facility is used. RMTCMD supports both SNA and IP.

NMC Focal Point Communication

You can use XCF to communicate between the target system and the RODM focal point system when both the target system and focal point system are members of the same sysplex. Otherwise, the RMTCMD command facility is used, either via SNA or IP. Feeding the configuration data into RODM has been significantly improved by minimizing the calls to FLCARODM and by reducing the amount of data obtained from the automation manager.

Smart Defaults for Generic Routines

The AUTOTYP parameter is no longer mandatory for the ISSUECMD and ISSUEREP commands. Instead, the current state of the resource is used to determine the automation flag to be checked.

The default of the MSGTYPE parameter has been changed for the ACTIVMSG, HALTMSG, and TERMMSG commands with the triggering message now as default. REPLY=YES is defaulted when AVTIVMSG, HALTMSG, and TERMMSG are called for a WTOR.

Rename Function for Entry and Subsystem Names in the PDB

Allows you to more easily change the name given to a policy object referred to as the entry name. Prior to SA z/OS 2.3, you had to copy the policy object, thereby giving it a new name and then deleting the obsolete entry. For entry type APL (application), you can also rename the subsystem name by simply overtyping the name.

Support for &AOCCLONE Variable Descriptions

This support allows you to assign descriptive information to an &AOCCLONEx variable, such as documenting what the clone is used for and other dependencies. This helps you to keep track of the various clones used in the PDB.

Automatic Defaulting of Job Name

The job name defaults to the subsystem name when applicable.

Sysplex Application Group Linkable to Multiple Sysplex Groups

The same Sysplex Application Group can now be linked to multiple sysplexes. This eliminates the need to define different sysplex application groups for the same application structure that run on more then one sysplex, for example Testplex and Prodplex.

Online Help for Common Routines and Utility Commands

Online help is provided for the common routines (ACFCMD, ACFREP, etc) as well as for the utility commands (INGUSS, INGPOST, etc). This eliminates the need for the automation administrator to look up the appropriate chapter in *IBM Tivoli System Automation for z/OS Programmer's Reference*. Furthermore, the online help is kept current.

Improved Group Control in a Sysplex

Better control of how groups are moved between images in a sysplex. A new series of preference values is defined that allows you to better control when and how an application move is performed. For example, you can define that the application should always be started on the system it was running before and should only move to another system using manual intervention.

Satisfactory Target Support for Server Groups

This allows you to specify a range for the number of members of a server group that must be available for the group to be in a satisfactory status. SA z/OS attempts to start up to the upper limit of the range, but considers the group "satisfactory" when the lower limit is up and running.

Support for Owner Information

You can specify either the owner or the person to be contacted for a particular application in the PDB. This information is visible in the INGINFO and DISPINFO command. In case of a problem, the operator can then easily obtain this information and contact the person in charge.

VM Second Level Systems Support

SA z/OS 2.3 introduces new support to control and monitor guest machines running under VM by Processor Operations.

Within VM other operating systems can be IPLed as guest machines. Of particular interest are LINUX guest machines, but MVS, VSE and even VM guest machines may be possible. Previously there was no effective way to enter commands to and receive messages from such a guest target system in order to validate that it has IPLed correctly, or that it is behaving correctly.

With second level guest machine support you can:

- Capture messages issued by the guest machine itself and route these back to the ProcOps process for either display or automated processing, or both
- Send commands to the guest machine from ProcOps, either as operator requests or automated actions

The guest target systems that are being controlled appear to an operator just as a regular target system does. That is, it:

- Behaves in a compatible way to the existing set of ProcOps commands

- Shows the same set of status values
- Has the same programming interfaces

Kanji Support

A Japanese National Language version of SA z/OS has been made available. It provides a Japanese version of online HELP information and of the messages.

Online help information for commands, messages and SysOps and ProcOps panels and the NMC Helps have been translated.

NetView Automation Table

SA z/OS 2.3 introduces a new function that generates Automation Tables (ATs) according to the AT structure that was introduced with SA OS/390 2.2. Based on a predefined AT template and on the user PDB, ATs are generated during the Configuration Build process. When loading the AT at automation run time the generated ATs can be loaded instead of INGMSG02.

Message List MPFLSTSA

SA z/OS 2.3 introduces a new function that generates a list of messages stored in a member named MPFLSTSA. Based on predefined messages used by SA z/OS 2.3 and on messages defined in the user PDB, MPFLSTSA is generated during the Configuration Build process. MPFLSTSA will help you define your MPF definitions.

Automation Routines

SA z/OS provides automation routines that enable automatic processing of z/OS components, data sets and job scheduling systems, as well as automation procedures that are useful tools in the automation processing context. By using these prefabricated automation procedures you can save time developing your own procedures to handle processing in corresponding situations.

Health and Performance Monitoring

Application-specific performance and health monitoring has been introduced. This means that a separate status shows up to inform you about the application's health. This health status is factored into the overall compound status of the application and, therefore, shown on the NMC screen, Status Display Facility (SDF), and NetView INGLIST command output. It can also be used by the automation manager to make decisions and, if necessary, trigger automation for the application.

To achieve this new functionality a new type of resource has been introduced: the monitor resource (MTR). MTRs are connected to application resources (APLs) or application group resources (APGs). The health status of the monitored object is propagated to the APLs and APGs and results in a health status there.

You can define and connect MTRs in the customization dialog. You can start, stop and list MTRs and manage their health states in the NetView environment and in the NMC. MTRs are not APLs, and therefore cannot be members of APGs.

Takeover File Repair

The takeover file that was introduced with SA OS/390 2.1 is a shared VSAM file. The automation manager has been changed to allow you to repair the takeover file while the PAM and the SAMs are running. Furthermore you are prompted before a

hot start is degraded to a warm start due to a takeover file open/read error.The takeover file is dynamically allocated during the initialization of the primary automation manager (PAM).

A new parameter, TAKEOVERFILE, has been introduced in the HSAPRM*xx* member that defines the name of the takeover file.

The INGAMS command has been enhanced to allow the automation manager to start or stop writing to the takeover file.

Avoiding Access to System Logger

Because the GDPS® on the K-system requires that no z/OS component has a connection to the system logger while performing, the automation manager no longer unconditionally establishes a connection to the system logger when the SA z/OS structures are defined in the coupling facility.

A new parameter, LOGSTREAM, has been introduced in the HSAPRM*xx* member that defines whether or not the automation manager should establish a connection to the system logger at initialization time.

A new option, LOGSTREAM, has been introduced in the INGXINIT member that defines whether or not the NetView agent should establish a connection to the system logger at initialization time.

New Group Behavior

Group control in a sysplex has been improved. By revising the rules for preference thresholds and bonuses, the following behavior is possible:

- Complete Manual Control - It is possible to take complete control of the group's selection of its members.
- Sticky Selection - Once a group is running somewhere, it remains there.
- Disaster Only Failover - A group is only moved if the node it should run on fails.

Enhanced Policy Database Samples

Table 5 gives details of the sample PDBs that are now supplied with the customization dialog.

Table 5. Sample PDBs Supplied with the Customization Dialog

Sample	Description
EMPTY	Allows the creation of a completely empty PDB.
DEFAULTS	Allows the creation of a PDB that only has the default definitions for Resident Clists and Auto Operators.
MULTISYS	Contains the definitions for a simple configuration with 4 systems.
SYSPLEX	Contains the definitions for a configuration with a sysplex of 4 systems.
SAP_HA	A PDB that defines the SAP high availability solution.
WAS401_HA	A PDB that defines the WebSphere 4.01 high availability solution.

Address Space ID Support

The generic routines ACTIVMSG, HALTMSG and TERMMSG respond to ACTIVE, UP, HALT and termination messages from applications by changing the status of the application.

In addition to the job name associated with the triggering message, the address space ID is checked to prevent generic routines from processing messages from applications that are not being monitored by SA z/OS.

Importing Policy Database Data

Using the customization dialog you can select a policy database from which you can import portions into your current policy database. Any database in your selection list can be used, including the sample databases that are delivered with SA z/OS.

This is the beginning of an activity spread over multiple deliverables with the aim of providing you with the ability to copy complete application groups, including nested groups and their links, from one PDB to another PDB.

Captured Messages Limit

The concept of captured messages has been enhanced to allow the specification of the limit in a more selective way. It is now possible to define a limit for each APL and MTR resource and an overall system limit.

These messages are shown in the DISPINFO and DISPMTR command output or the SA z/OS Graphic Interface.

Separation of User and SA z/OS Policies

Previously, user policy definition changes were stored in the same table as the standard SA z/OS policy items delivered with the customization dialog. This table is changed with each new release because there are changes in the policy item list. This changed table is delivered with the new release, and in order to get these changes, a user has to delete their own personal table with their user modifications. As a result, with every new release the user definitions have to be repeated.

The existing SA z/OS policy table has been renamed and a separate user table introduced that contains only user modifications. This means that with new releases only the SA z/OS policy table will have been changed; the user table will not be effected by new releases.

Support for Multiple WLM Names

It is now possible for up to three WLM name to be associated with an application. If the application reaches its UP state, SA z/OS sets the WLM resource to ON, otherwise it is OFF. This enables an installation to better control its schedule environments within WLM.

The DISPINFO command has been enhanced to show all WLM element names defined for the application.

Password Protection

Because of the changes in the use of gateway sessions, the procedure to install the optional password protection has also changed.

To install the SA z/OS password protection feature, install SA z/OS as described in "Step 20: Define Security" on page 133.

Note: To plan your RMTCMD-based INGSEND security, see the discussion of RMTCMD security features in the NetView library.

IMS Enhancements

IMS Product Automation has been enhanced to support the automated starting and stopping of IMSplex support regions. The following types of address space are now supported:

1. SCI—The IMS Structured Call Interface Support Region.
2. OM—The IMS Operations Manager Support Region.
3. RM—The IMS Resource Manager Support Region.

In addition IRLM start and stop automation is also supported.

Changes with Commands and Routines

This section provides details of the commands and routines that are new or have been changed in SA z/OS 2.3:

- "New Commands" on page 28
- "Enhanced Commands" on page 29
- "New Routines" on page 15
- "Enhanced Routines" on page 16

Check your user-written CLISTs to find out whether these changes have an impact on them.

For a detailed and complete description of the SA z/OS commands, refer to *IBM Tivoli System Automation for z/OS Operator's Commands* and *IBM Tivoli System Automation for z/OS Programmer's Reference*.

New Commands

Table 6. New Commands Shipped with SA z/OS 2.3

New Command	Short Description
DISPMTR	This command displays and allows you to manage monitors that you have defined using the customization dialogs for your system.
INGVARS	The INGVARS command allows you to share variables among all systems in the same sysplex. It provides an easy way to set, retrieve, or delete the variable. The variable can be associated with the sysplex, a system in the sysplex, or a resource running in one of the systems. A user written clist can query the content of the variable or set the variable from any system in the sysplex.
ISQXPSM	This command starts or stops the ProcOps Service Machine on a hosting VM system.

New Routines

Table 7. New Routines Shipped with SA z/OS 2.3

Routine	Description
INGPJMON	A new monitoring routine will be provided that replaces AOFAJMON but provides additional functions: • Optionally returns the job name and address space ID that matches passed criteria • Allows you to search for all address spaces that match the specified job name • Supports address space as an optional search criterion

Enhanced Commands

Table 8. Enhanced Commands Shipped with SA z/OS 2.3

Command	Description
AOCTRACE	The AOCTRACE command now supports the TARGET and OUTMODE parameters.
AOFCPMSG (Capture Message)	COMMENT= parameter added to allow user specification of a comment. CAPMSGS Code Match message changed to allow specification of enhanced comments to the captured message. Further information in the Programming Manual.
DISPINFO	The DISPINFO command now shows all WLM element names defined for the application. It now displays owner information.
IMS (IMS main panel)	The IMS Active Regions display has had the automatic refresh function (PF9) removed in line with SA z/OS base compatibility.
INGNTFY	The former DISPNTFY command is now incorporated into the INGNTFY command so you now have only one command when dealing with notify operators. The INGNTFY command shows a list of all defined notify operators and allows you to add, change, or delete the notify operator definitions by means of command codes entered in front of the row.
INGRELS	The INGRELS command now has easier navigation through the dependency graph and you can launch other commands (such as INGVOTE or INGINFO) simply specifying the appropriate command code. The OUTDSN option is now also supported by the INGRELS command, allowing you to store the output of the command in a data set.

Table 8. Enhanced Commands Shipped with SA z/OS 2.3 (continued)

Command	Description
INGREQ	The AOFEXC01 exit of the INGREQ command allows you now to override the INGREQ parameters, for example, you can set the PRI=FORCE option when a shutdown of the entire system is requested. You can now specify the EXPIRE parameter in relative time notation, for example, `EXPIRE=(+04:00)` The relative time will be automatically converted into the absolute date and time. The maximum relative time interval is 24:00 hours. The REMOVE option of the INGREQ command has been enhanced to accept the AVAILABLE and DEGRADED observed status, as well as SYSGONE and UNKNOWN. INTERRUPT= parameter added to allow you to specify whether or not to interrupt the startup phase of the resource.
INGVOTE	A new option, called SOURCE, allows you to see only the requests and votes from a particular source and user. When running in line mode, the output now shows all detailed information (for example, timeout info, application parameters) that were previously only available in fullscreen mode by selecting the detail action.

Enhanced Routines

Table 9. Enhanced Routines Shipped with SA z/OS 2.3

Routine	Description
ACTIVMSG	Smart defaulting of parameters when called from the NetView automation table has been implemented. In addition to the job name associated with the triggering message, the address space ID is checked to prevent generic routines from processing messages from applications that are not being monitored by SA z/OS. The processing of status commands has been simplified and unified.
AOFCPMSG	A new optional parameter, COMMENT, has been added. It specifies additional text that will be appended to the message in SDF and placed in the DATA3 field for NMC.
AOFRSA01	Processing for LOGREC data set nearly full. An additional policy entry is required for LOGREC processing when thresholds are used. Entry type MVS Component, entry name MVS_COMPONENTS, policy item MESSAGES/USER DATA, Message ID LOGREC requires a command with a selection of blank or ALWAYS to function correctly. Refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* for details.

Table 9. Enhanced Routines Shipped with SA z/OS 2.3 (continued)

Routine	Description
AOFRSA02	Processing for LOGREC data set full. An additional policy entry is required for LOGREC processing when thresholds are used. Entry type MVS Component, entry name MVS_COMPONENTS, policy item MESSAGES/USER DATA, Message ID LOGREC requires a command with a selection of blank or ALWAYS to function correctly. Refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* for details.
AOFRSA03	Processing for SMF data set full. An additional policy entry is required for SMFDUMP processing when thresholds are used. Entry type MVS Component, entry name MVS_COMPONENTS, policy item MESSAGES/USER DATA, Message ID SMFDUMP requires a command with a selection of blank or ALWAYS to function correctly. Refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* for details.
AOFRSA08	Processing for SYSLOG data set full. An additional policy entry is required for SYSLOG processing when thresholds are used. Entry type MVS Component, entry name MVS_COMPONENTS, policy item MESSAGES/USER DATA, Message ID SYSLOG requires a command with a selection of blank or ALWAYS to function correctly. Refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* for details.
AOFRSA0C	Processing for SVC dumps. An additional policy entry is required for MVSDUMP processing when thresholds are used. Entry type MVS Component, entry name MVS_COMPONENTS, policy item MESSAGES/USER DATA, Message ID MVSDUMP requires a command with a selection of blank or ALWAYS to function correctly. Refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* for details.
AOFRSE0J	Processing for JES3 ABEND/DUMP. An additional policy entry is required for JES3 ABEND/DUMP processing when thresholds are used. The JES3 Application definition, policy item MESSAGES/USER DATA, Message ID JESABEND requires a command/reply selection of blank or ALWAYS to function correctly. Refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* for details.
EVJRYCMD (TWS Batch Command Interface)	TIMEOUT= parameter added to allow user specification of the time that the batch job waits for commands in SA z/OS to execute.

Table 9. Enhanced Routines Shipped with SA z/OS 2.3 (continued)

Routine	Description
HALTMSG	Smart defaulting of parameters when called from the NetView automation table has been implemented. In addition to the job name associated with the triggering message, the address space ID is checked to prevent generic routines from processing messages from applications that are not being monitored by SA z/OS. The processing of status commands has been simplified and unified.
ISSUECMD	Smart defaulting of parameters when called from the NetView automation table has been implemented. Now accepts the parameters CODE1, CODE2, CODE3. These are used for a lookup in code entry of ENTRY/TYPE to get as response an option used to select the commands to issue from automation control file.
ISSUEREP	Smart defaulting of parameters when called from the NetView automation table has been implemented.
TERMMSG	Smart defaulting of parameters when called from the NetView automation table has been implemented. In addition to the job name associated with the triggering message, the address space ID is checked to prevent generic routines from processing messages from applications that are not being monitored by SA z/OS. The processing of status commands has been simplified and unified.

Enhancements of Parallel Sysplex Operation

SA z/OS 2.3 provides functional enhancements that grant greater system reliability and availability in the sysplex. Sysplex management with SA z/OS is enhanced as follows:

- A number of recovery actions can now be automated, for example:
  - Creating or re-creating missing alternate couple data sets (CDSs)
  - Expanding the system logger CDSs in case of a directory shortage
  - Resolving of WTO(R) buffer shortages
  - Avoiding sysplex outages
  - Resolving pending I/Os for systems being removed from the sysplex
  - Recovering auxiliary storage
  - Recovery of long-running ENQs

  Each automatic recovery action can be enabled or disabled separately. To do this, additional minor resources are introduced for the MVS Component policy object (MVC entry type). A number of these actions can be customized.
- The previously available sysplex-related commands have now been merged into two powerful commands, INGPLEX and INGCF. Furthermore, the following functions were introduced:
  - Making an alternate CDS the primary one
  - Defining a new alternate CDS

- Switching the active policy
- Integrating a coupling facility into the sysplex
- Recording IPL information
- Allowing for specifying dump options
- Allowing for multisystem SVC dumps
- Viewing, enabling disabling, and deleting SLIP traps defined in the sysplex

For details about customizing and using these functional enhancements refer to *IBM Tivoli System Automation for z/OS Defining Automation Policy*, *IBM Tivoli System Automation for z/OS Customizing and Programming*, *IBM Tivoli System Automation for z/OS Operator's Commands*, and *IBM Tivoli System Automation for z/OS User's Guide*.

Changes with User Exits

User exits have been enhanced and new exits have been added to SA z/OS. The new user exits are documented in *IBM Tivoli System Automation for z/OS Customizing and Programming*.

New User Exits:

Exit	Command	Description
AOFEXC05	INGLIST	The exit allows you to modify the input parameters.
AOFEXC06	INGSET	The exit allows you to perform authorization checking of the resources for the INGSET command.
AOFEXC07	INGIMS	The exit allows you to perform authorization checking of the resources for the INGIMS command.
AOFEXC08	INGVOTE	The exit allows you to perform authorization checking of the resources for the INGVOTE command.
AOFEXC09	SETSTATE	The exit allows you to perform authorization checking of the resources for the SETSTATE command.
AOFEXC10	INGEVENT, DISPEVTS, DISPTRG	The exit allows you to perform authorization checking of the resources for the INGEVENT command.
AOFEXC11	INGCICS	The exit allows you to perform authorization checking of the resources for the INGCICS command.

- AOFEXC05 through AOFEXC011

Enhanced User Exits:

- AOFEXC01

New Sample Exit:

- AOFEXX01 can be used for exit AOFEXINT.

Changes with User Exits

Chapter 3. What Is New in SA z/OS 3.1

This chapter contains an overview of the major changes to SA z/OS for Version 3 Release 1. Use this information to check the impact on your user-written programming interfaces, such as automation procedures.

Enhancements to the Customization Dialog

This section introduces the most important changes in the behavior of the customization dialog in comparison to earlier releases.

Adding, Updating and Deleting Large Amounts of Data

As an alternative to entering or modifying policy data with the customization dialog, you can now create sequential data sets with specifications of policy data in a newly designed text format. These sequential data sets allow you to see multiple policy items of multiple database entries at a glance, but in contrast with database *reports*, they can be edited and, as long as you do not violate the syntax designed for them, they can be *imported* into existing policy databases. Two keywords, `new` and `update`, in the sequential data set control whether the import will add entries to the policy database or modify existing entries in it. Data sets for import into policy databases can be created either "from scratch" or by *exporting* selected parts of an existing policy database.

In addition to deleting single policy objects one by one, you can now delete any number of policy objects all at once. With this new feature, you can specify how often you want to be asked for confirmation. Your options are:

- Confirmation with each policy object to be deleted
- Confirmation only with those policy objects that are still connected to other policy objects (via links, membership, class instantiation etc.)
- No confirmation at all

If you confirm deletion of an object that is still connected, any links to it etc. will be removed, too.

Policy Database Import

The PDB Import function, provided in SA z/OS 2.3, allowed you to import one or multiple policy objects of a single entry type from another PDB into the current one. However, the data imported did not yet include any link information.

This restriction has now been removed. When importing a policy object, the associated policy objects that are referenced via an entry type link or class/instance links are copied as well. This enables you to import entire "logical" units in a single import operation. For instance, an entire application group and everything that "belongs" to it is copied to the target policy database.

The PDB Import function supports the inclusion of the "linked" objects for the following entry types:

- APG (application group imported along with APLs, SVPs, and TRGs)
- APL (application instance imported along with class APL, and class APL imported along with its APL instances, both of them along with SVPs, TRGs, CSAs, and ISAs that are linked to them)

- TRG (trigger imported along with EVTs)

Enhancements to the *Entry Name Selection* Panel

QUERYSTAT Command

The new QUERYSTAT command shows statistical information about a policy object. In particular, the following information is shown:

- The user ID that made the last update
- The date and time of the last update
- The date and time of the last build
- The ACF fragment name (if built into ACF)

Fast Paths to Jump Directly to Individual Policy Items

To speed up policy item selection, the ***Entry Name Selection*** panel now allows you to specify abbreviations for the policy items that are available for the current entry. To avoid restrictions or mnemonics that may be hard to remember, there are no predefined abbreviations. Instead the customization dialog tries to match all input to a policy item.

Streamlining of Policy Definitions

The AUTOMATION INFO policy item that is currently attached to the APL entry type has been retired. The APPLICATION INFO policy item has been updated to contain all the input fields that were previously available on the AUTOMATION INFO policy item and a field for “startup parameters”.

The NETVIEW and AUTOMATION SETUP policy items that are currently attached to the SYS entry type have been retired. The SYSTEM INFO policy item has been updated to contain all the input fields previously available on the NETVIEW and AUTOMATION SETUP policy items.

Concurrent Multi-User Access to System Definitions

Concurrent write-access by multiple users is now possible for policy objects of type SYS, too.

Report Member Consolidation

Currently there are several members created by the Customization Dialog in the Policy Build Output data set either for special reports, for example, the unlinked report, or as a log for special, long-running tasks, for example, the control file build. The report members are now written to the newly introduced report data set.

Supporting System Symbols and AOCCLONES

The OPC CONTROL policy has been enhanced to allow input of symbols in the subsystem ID field.

Subtype for applications of type STANDARD

The support of subtypes, previously available only for non-standard applications, is now extended to applications of all types, for example, to use it as a filter for the INGLIST command output.

Add-On Sample Policy Databases

Developing an automation policy requires knowledge of the automated product (for example, WebSphere, SAP) as well as knowledge of the automating product (SA z/OS).

Best practice policies (sample policy databases) are delivered with SA z/OS 3.1 where both aspects are combined: Using SA z/OS concepts, best operating practices are stored as integrated sample policies. This enables you to get productive much faster, also in the case of migrating from competitive products (significantly reduced time to value).

Even if you have developed your own automation, you may use SA z/OS best practice policies as a proofpoint.

If you start working with a new product, you may use SA z/OS best practice automation policies as a valuable knowledge base of product topology and dependencies.

SA z/OS best practice policies provide z/OS base automation as well as middleware or application add-on automation that can be tailored to your needs.

Best practice policies can be added on top of your existing automation, thus allowing for a stepwise enhancement.

The collection of sample policy databases that is shipped with SA z/OS has been completely restructured and rewritten. There is now a distinction between:

- Basic samples
- Add-on samples

The basic samples are only two:

- `*BASE`
- `*EMPTY`

The add-on samples are these (for further information on them, refer to *IBM Tivoli System Automation for z/OS Defining Automation Policy*):

- `*CICS`
- `*DB2`
- `*E2E`
- `*GDPS`
- `*IMS`
- `*NMC`
- `*OMEGAMON`
- `*PROCOPS`
- `*SAP`
- `*TWS`
- `*USS`
- `*WEBSPHERE`

OMEGAMON Integration

SA z/OS now integrates the OMEGAMON® suite by means of automated *sessions*. This complements message-based automation with new *proactive* monitoring capabilities.

The OMEGAMON interface enables you to gather a wide range of performance data on a system. You can gather data from the following performance monitoring products:

- OMEGAMON for MVS
- OMEGAMON for CICS
- OMEGAMON for IMS
- OMEGAMON for DB2

Exception analysis is an OMEGAMON feature that monitors predefined thresholds in a system. When a threshold is exceeded, OMEGAMON displays the fact (which is referred to as an *exception*) on the OMEGAMON console.

SA z/OS can establish direct VTAM® communications with the four 'classic' OMEGAMONs. These VTAM links enable SA z/OS to directly receive OMEGAMON exceptions and to react to these exceptions accordingly by means of user-written *reaction* routines. The installation can then act on these exception alerts by running execs or issuing commands, including issuing commands back to the host OMEGAMON.

You can use policy definitions to instruct SA z/OS to query a particular OMEGAMON at regular intervals for an exception and then take an action when that exception occurs. For example, you could trap an OMEGAMON for CICS PAGE exception (page-in rate too high), and then write a reaction routine that reduces the system workload whenever that situation occurs.

The automation administrator can use the INGOMX interface to send OMEGAMON commands and receive their responses in SA z/OS. For example, you might have trapped an exception that indicates that a job is in a wait condition. You can then use OMEGAMON commands to provide more information about the exception and the job, or take actions, such as cancelling the job.

The concept of monitoring resources that was introduced in SA z/OS 2.3 to provide health information about a resource has been extended to provide exception data from the corresponding OMEGAMON. This is achieved with a new layer, referred to as the OMEGAMON API. The OMEGAMON API serves the following purposes:

- It establishes sessions with the various OMEGAMONs using logon data that is specified in the policy database.
- It monitors the sessions and re-establishes a session if necessary.
- It acts as the bridge between the monitoring resource and the OMEGAMON that the resource monitor is linked to.

The communication is semidirectional. It is always the monitoring resource that asks the appropriate OMEGAMON to do something and then waits for the response from the command.

The new API, INGOMX, is a REXX function that can be called by execs or operators to interact with a named OMEGAMON session. INGOMX can be used

by monitor resources to monitor critical resources that OMEGAMON exceptions have been defined for, to react to such exceptions, or to issue OMEGAMON commands.

GDPS Integration

The amount of time that it takes to install and set up SA z/OS and NetView for use with GDPS has been significantly reduced. This has been accomplished by providing a predefined GDPS environment delivered as part of SA z/OS:

- A sample NetView and SA z/OS startup procedure containing all SA z/OS and GDPS-specific elements.
- Inclusion of the GDPS-specific messages in the SA z/OS-provided message table INGMSG01, thus eliminating the need for you to customize the message table for use by GDPS.
- A sample add-on policy database named *GDPS that includes all definitions for a complete GDPS environment.
- Sample z/OS PARMLIB members required for GDPS.
- Automatic disabling of SA z/OS-provided automation functions that are inconsistent with GDPS when GDPS is installed. This eliminates the need for you to manually turn off the appropriate function in SA z/OS:
  - Automation when the system leaves the sysplex (IXC102A message)
  - CDS recovery

Enhancements to the NetView Management Console

The NetView Management Console is enhanced by the following new features:

- *Incremental* RODM update with the INGAMS REFRESH command
- Color distinction in the display of compound statuses
- Automatic distribution of the system automation profile from an NMC server to NMC clients

Profile Distribution

A profile residing on the NMC server is automatically distributed to all clients when starting the NMC client. This is done by NetView via the same process that delivers fixes from the NMC server to the NMC client.

The SA z/OS code has been modified to search both directories for the profile. The search sequence is:

1. Directory “TDS/client/settings”
2. Directory “TDS/client/lib”

The advantage is that any update to the SA z/OS profile “ingnmcpr.txt” only needs to be applied to the NMC Server.

Different Color for Satisfied Compound Status

A new statement, MAPCOLOR, has been introduced in the INGTOPOF member that allows the installation to define the color to be applied to the UNAVAILABLE status. This allows the installation to distinguish between a “correctly unavailable” versus a “correctly available” status. Currently both conditions are shown in green. By giving the Unavailable condition a different color, for example, light green, the operator can easily distinguish between the two states.

Performance Enhancements

The RODM data feed that is triggered when a configuration refresh (INGAMS REFRESH) is processed so that only the configuration changes are forwarded to the NMC focal point causing updates in RODM. Previously the entire configuration - all resources, their relationships and status - was sent to the NMC focal point. Often this is unnecessary because the change in the configuration is not relevant to RODM.

Sending just the relevant configuration data to the focal point and feeding RODM with the configuration changes results in better performance due to less system utilization. This approach avoids mass updates in RODM and a side effect is that users at the NMC client are not disturbed.

Display Improvements

The health status is now considered in the process of mapping the states known by the AM (compound, desired, observed) to the state shown on the NMC client, thus enabling easier problem determination by the operator.

All relationships used to setup the start or stop dependencies are shown with solid lines between the resources. Previously, only the HasParent, HasMonitor and HasMember relationships were shown on the NMC client.

Cleanup of CICS and IMS Message Exit

The message policy definition within the SA z/OS Customization Dialog has been enhanced to allow the automation administrator to define the messages to be exposed to automation from within CICS or IMS. The administrator has one place to customize the behavior of the CICS or IMS message exit function. When the CICS or IMS subsystem starts, the message policy from the configuration is loaded into the CICS or IMS subsystem respectively and the message exit is enabled. In previous releases, the administrator had to assemble the message exit definitions into a load module and make the load module accessible to the CICS or IMS subsystem at run time.

A refresh of the configuration policy will force a refresh of the message exit definition in the appropriate CICS or IMS subsystem. Each CICS or IMS subsystem can have its own message exit definitions without affecting any other CICS or IMS subsystem.

The current implementation does not allow the administrator to reload Message Exit policies without a restart of CICS or IMS. The new solution allows you to reload of policies with the INGAMS refresh function. Furthermore, only CICS or IMS subsystems that have had policy changes will be reloaded.

Controlling Status Change Notifications

Two new user exits have been introduced that allow the installation to control whether or not status change notification should be forwarded to SDF or NMC:

Table 10.

User Exit	Purpose
AOFEXX02	Controls all updates going to SDF
AOFEXX03	Controls all status change modifications going to NMC

The user can reduce the traffic going to SDF or NMC via the exits, thereby improving the overall performance significantly.

End-to-End Automation Adapter

End-to-end automation can be used to automate the operation of resources within heterogeneous environments (called first-level automation domains) that each have a local automation technology of their own. Each first-level automation domain is connected to the end-to-end automation manager by an automation adapter.

The end-to-end automation manager is provided by IBM Tivoli System Automation for Multiplatforms.

- It provides continuous availability for heterogeneous distributed IT business applications.
- It reduces the total cost of ownership.

The automation adapter acts as the link between the end-to-end automation manager and its first-level automation domain (that is, the SA z/OS sysplex group).

The purpose of the automation adapter is to:

- Monitor resources within its first-level automation domain
- Propagate resource attribute changes to the end-to-end automation manager
- Start and stop resources within the first-level automation domain by request of the end-to-end automation manager
- Provide information about resources that are available within the first-level automation domain in response to queries from operators

Performance

SA z/OS Initialization Time

The SA z/OS initialization time has been improved by performing bulk updates of the Automation Status File and SDF rather then updating the ACF update and SDF update for each resource individually.

SDF Performance

Major pieces of the SDFADD, SDFDEL and SDFQRY commands have been rewritten to eliminate recursive implementation. The use of recursion, while simplifying the programming considerably, significantly worsens the performance. The performance of the SDFADD, SDFDEL and SDFQRY commands has been significantly improved.

Enhancements to SA z/OS Commands

This section provides details of the commands and routines that are new or have been changed in SA z/OS 3.1:

- "New Commands" on page 28
- "Enhanced Commands" on page 29

Check your user-written CLISTs to find out whether these changes have an impact on them.

For a detailed and complete description of the SA z/OS commands, refer to *IBM Tivoli System Automation for z/OS Operator's Commands* and *IBM Tivoli System Automation for z/OS Programmer's Reference*.

New Commands

Table 11. New Commands Shipped with SA z/OS 3.1

New Command	Where Invoked	Short Description
INGMOVE	Operator Interface	This command makes preference values transparent to the operator when moving applications to another system.
INGMTRAP	API	This is a monitoring command that makes for a periodical gathering of exceptions.
INGOMX	API	This command makes for interaction of scripts with some specified OMEGAMON session.
INGSESS	Operator Interface	This command displays all OMEGAMON sessions and their current status.
INGSTR	Operator Interface	This command shows allocated and unallocated structures at a glance and relocates structures to their intended location. In contrast with INGCF STRUCTURE, it ensures that only one command is executed at a time.
ISQIPSWT	Operator Interface	This command allows you to switch the IP address that processor operations uses for communication with the service element.

INGMOVE Command

A new command called INGMOVE has been introduced that makes moving sysplex application groups a lot easier. Rather than forcing the operator to manipulate the preference value of each member in the sysplex application group, the operator simply specifies where the group should be moved to. In a sysplex application group of type move only one member is active at a time. By specifying the new location of the move group, the active member is terminated and the member associated with the new location is activated.

INGMTRAP Command

A new command called INGMTRAP command facilitates the use of the new command INGOMX for monitoring that is related to Monitor Resources. It invokes the INGOMX command to trap a list of exceptions that are monitored by the given OMEGAMON monitor.

INGOMX Command

A new command called INGOMX has been introduced to interact with a named OMEGAMON session (see "OMEGAMON Integration" on page 24).

INGSESS Command

A new command called INGSESS has been introduced that displays the OMEGAMON session definitions, the session status and statistical information about the session. With this command the operator is able to see the session details, both policy definitions and run-time details as well as to start or stop an OMEGAMON session.

INGSTR Command

A new command called INGSTR has been introduced that relocates structures to their desired location. It fills the leak left when a coupling facility has been drained for maintenance purposes and enabled again later or a new CFRM policy has been activated with different preference lists.

The INGSTR command is modeled on the INGCF STRUCTURE command. The main difference to the existing INGCF command is that the new INGSTR command also shows the current location (or locationss) and the preferred location (or locations) of each structure. In addition, the indicator '*' prefixes the preferred location (or locations) if the structure does not allow XCF to perform the reallocation.

ISQIPSWT Command

A new command called ISQIPSWT has been introduced to allow you to change the IP adapter address for the connection with the Support Element (SE), thus using the alternate adapter's IP address. Without this support, you must terminate processor operations, which will affect all processor operations connections, update the single changed IP address in entry type PRO of your policy database, perform a processor operations build, and finally issue a processor operations cold start.

The loss of communication because of an SE adapter failure cannot be broadcast to processor operations because there is not a second connection active that can be used for the purpose of internal integrated connection recovery. Therefore the new command is offered as an optional recovery aid. The command is also applicable in situations when a Support Element's IP address has to be changed because of a service action rather than an adapter failure.

Enhanced Commands

Table 12. Enhanced Commands Shipped with SA z/OS 3.1

Command	Description
ACF	The ACF command can now be used to reload automation tables that are specified in the policy database. A new ACF CHECK option checks automation agent configuration data for consistency.
AOCTRACE	The AOCTRACE command now supports an additional parameter, named "MSG", to specify messages to be traced in your netlog.
ASF	The ASF API command is now pipeable.
ASFUSER	The ASFUSER API command is now pipeable.
DISPINFO	The DISPINFO command now shows additional information for CICS, IMS and VTAM resources.
DISPSYS	The DISPSYS command now shows captured messages for MVSESA etc.
INGGROUP	The INGGROUP command can now be customized through a new user exit, named "AOFEXC13".
INGINFO	The INGINFO now shows the values that are assigned to user variables associated with resources.
INGLIST	The INGLIST command now supports an additional YES/NO-valued parameter, named "MEMBERS", to toggle display of members of a resource group.
INGMON	The INGMON command can now be coded into the automation table.

Table 12. Enhanced Commands Shipped with SA z/OS 3.1 (continued)

Command	Description
INGREQ	The REQ parameter of the INGREQ command can now be given a value of "CANCEL" to cancel a previously made request from the same source.
INGTHRES	The threshold has been raised from 10 to 50.
INGVTAM	The INGVTAM command now has automation of the IMS Applid integrated.
OPCAQRY	The OPCAQRY command now has the same look and feel as the other commands. It now displays details in a way similar to DISPINFO.

ACF Command

The ACF command has been enhanced to allow the operator to reload the automation tables (ATs) that are specified in the policy database, thereby disabling the sections in the automation tables that do not apply due to the active configuration.

The ACF CHECK option has been introduced to allow the operator to check the automation agent configuration data for consistency. The following checks are made:

- Matching configuration token
- Automation tables specified in the policy database for errors
- Other configuration validation (correct format of ACF fragments)

AOCTRACE Command

The AOCTRACE command has been enhanced to gather message attributes for a particular message without disturbing automation. This is done by activating message tracing. Once message tracing is active for a particular message and the message is passed to NetView (AT processing), all attributes that are associated with the message are shown. Examples are job name, job number, MCS flags. This makes debugging a lot easier if the coded message trap does not work.

ASF and ASFUSER Commands

The restriction of the ASF and ASFUSER commands not being PIPEable has been removed. The ASFUSER command supports up to 40 user fields.

The structure of the Automation Status File (ASF) has been changed so that it now supports up to 50 error timestamps.

DISPINFO Command

The DISPINFO command has been enhanced to display more information from CICS, IMS and VTAM:

- For CICS, the CICSPlex information, UOW checking, last start type and last abend code are displayed.
- For IMS, the IMSID, CQS, FDR, AVM, DC status and last abend code are displayed.
- For VTAM, the current and desired status of VTAM Applids for subsystems that are registered to INGVTAM are displayed.

DISPSYS Command

The DISPSYS command has been enhanced to show the messages captured for MVSESA.

INGGROUP Command

The INGGROUP command has been enhanced to invoke user exit AOFEXC13 to allow the installation to check whether the issuer of the command is authorized to perform the action. This is similar to the other command exits that where introduced in former releases of SA z/OS.

A new option for the ACTION parameter has been introduced that shows the policy settings, such as the group type, list of systems excluded or to be avoided for the specified resource groups. With the ACTION=POLICY parameter you can see the current attributes that are assigned to the resource group.

INGINFO Command

The INGINFO command has been enhanced to show the values assigned to user variables. User variables can be associated with a resource by means of the INGVARS command. This eliminates the need to use the INGVARS command in order to see the user variables associated with the resource.

INGLIST Command

A new parameter called MEMBERS has been added to the INGLIST command. It causes the members of the specified application group to be displayed. Previously, this was only possible when invoking the INGLIST command in fullscreen mode and specifying action code G in front of the application group.

INGMON Command

The INGMON command is the main interface for telling SA z/OS the health status for a particular monitor resource. Its primary use is from within the NetView automation table when trapping a message that can be directly mapped into a health status.

The command has been enhanced so that it can be coded into the NetView automation table to issue commands in response to an OMEGAMON exception.

INGREQ Command

The INGREQ command has been enhanced to allow the operator to cancel a previously made request. The operator no longer needs to use the INGVOTE or INGSET command in order to remove a request. This is more logical because the INGREQ command is also used to inject a start or stop request for the resource. The source of the request to be cancelled is automatically determined in the same way as it is done when firing off a start or stop request.

INGTHRES Command

The maximum number of errors before the threshold is reached is now 50. The limit was 10 in previous releases.

INGVTAM Command

Automation of the IMS Applid has been integrated into the base INGVTAM service. There is no need to register the IMS subsystem via the INGVTAM command because this is automatically done if a major node or nodes is or are specified in the IMS control policy.

OPCAQRY Command

The OPCAQRY command has been rewritten so that it provides the same look and feel as the other SA z/OS commands. Furthermore, the command provides linemode output and is PIPEable.

Changes with User Exits

Other than the status change notification exits presented in "Controlling Status Change Notifications" on page 26, SA z/OS 3.1 only introduces one new user exit. It is named AOFEXC13 and it is invoked by the INGGROUP command. For full documentation of this new user exit, refer to *IBM Tivoli System Automation for z/OS Customizing and Programming*.

Chapter 4. Planning to Install SA z/OS on Host Systems

Component Description

The SA z/OS product consists of the following components:

- System operations (*SysOps* for short)
- Processor operations (*ProcOps* for short)
- I/O operations (*I/O Ops* for short)

System Operations

System operations monitors and controls system operations applications and subsystems such as NetView, SDSF, JES, RMF™, TSO, RODM, ACF/VTAM, TCP/IP, CICS, DB2, IMS, TWS, OMEGAMON and WebSphere.

Enterprise monitoring is used by SA z/OS to update the NetView Management Console (NMC) resource status information which is stored in the Resource Object Data Manager (RODM).

Processor Operations

Processor operations monitors and controls processor hardware and VM guest systems operations. It provides a connection from a focal point processor to a target processor. With NetView on the focal point processor, processor operations automates operator and system consoles for monitoring and recovering target processors.

Processor operations allows you to power on and off multiple target processors and reset them. You can perform IPLs, set the time of day clocks, respond to messages, monitor status, and detect and resolve wait states.

I/O Operations

I/O operations provides a single point of control for managing connectivity in your active I/O configurations. It takes an active role in detecting unusual I/O conditions and lets you view and change paths between a processor and an input/output device, which can involve using dynamic switching (the ESCON switch).

I/O operations changes paths by letting you control channels, ports, switches, control units, and input/output devices. You can do this via ISPF dialogs, as well as on an operator console or API.

SA z/OS and Sysplex Hardware

When SA z/OS is used in a Parallel Sysplex® environment, the hardware setup can be similar to the one illustrated in Figure 1.

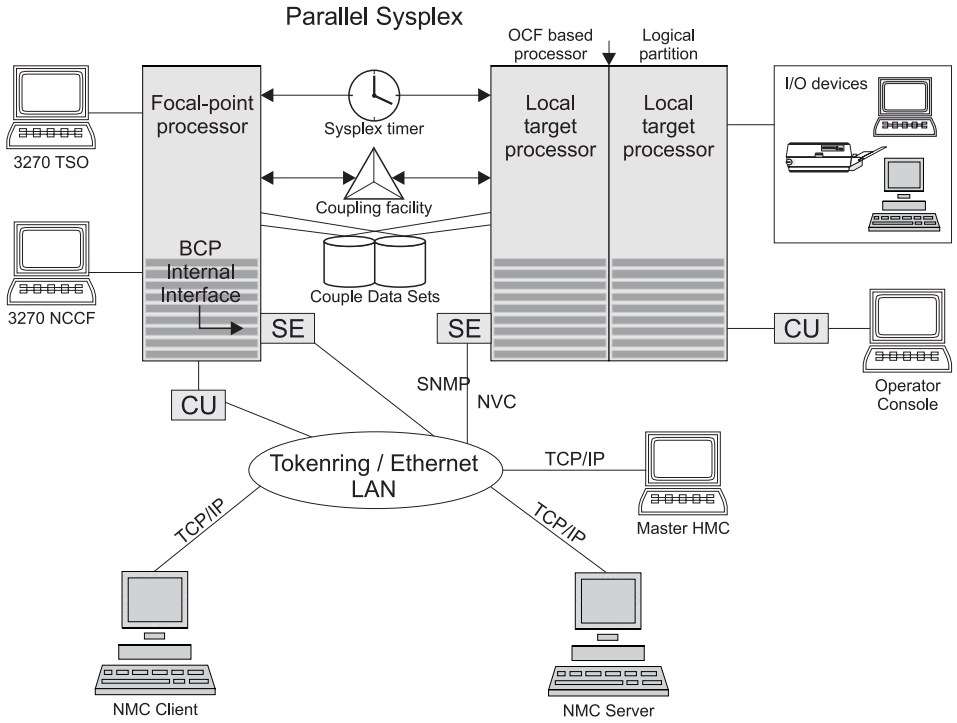

Figure 1. Basic Hardware Configuration

It shows a two processor Parallel Sysplex configuration, with systems running on it. One is playing the role of a SA z/OS focal point. For example, the role of the SA z/OS NMC focal point with information about all the systems and applications in the sysplex, running under the control of SA z/OS.

Operators can use a workstation with the SA z/OS NMC client code installed, to work with graphical views of the SA z/OS controlled resources stored on the focal point. The NMC server component receives status changes from the NMC focal point and distributes them to the registered clients to update their dynamic resource views. Sysplex specific facilities, like the coupling facility hardware can be

managed and controlled using the NMC's client graphical interface, as well as the 3270 NCCF based SA z/OS operator interfaces.

With the same interfaces, processor operations, another SA z/OS focal point function can be operated. With processor operations it is possible to manage and control the complete processor hardware in a sysplex. Operator tasks like re-IPLing a sysplex member, or activating a changed processor configuration can be accomplished. Processor operations uses the processor hardware infrastructure, consisting of the CPC Support Element (SE), or the Hardware Management Console (HMC) interconnected in a processor hardware LAN, to communicate with the own, other local, or remote located Support Elements of other CPCs. The Support Elements provide the Systems Management Interface OCF (Operations Command Facility) to perform hardware commands like LOAD or SYSTEM RESET to control the hardware and hardware images. SA z/OS processor operations can be customized to use SNA-based NetView connections (NVC), or IP based SNMP for communication. For Parallel Sysplex environments, SA z/OS provides an additional processor hardware interface, the BCP (basic control program) internal interface. This interface is independent from processor operations. It allows processor hardware operation in a sysplex, without requiring external network CUs (control units). From a system in the sysplex, the SE of the own CPC as well as the SEs of the other processors in the sysplex can be accessed.

The following describes some relevant resources used by SA z/OS and its components.

OCF-Based Processor

A central processor complex that interacts with human operators using the interfaces provided by the Support Element (SE). OCF-based processors are processors from the 390-CMOS processor family.

Parallel Sysplex

A set of z/OS systems communicating and cooperating with each other through certain multisystem hardware components (coupling devices and sysplex timers) and software services (couple data sets). In a Parallel Sysplex, z/OS provides the coupling services that handle the messages, data, and status for the parts of a multisystem application that has its workload spread across two or more of the connected processors. Sysplex timers, coupling facilities, and couple data sets containing policy and states for basic functions are all part of a Parallel Sysplex. You can control a Parallel Sysplex by NetView-based commands or through an NMC workstation.

Coupling Facility

A hardware storage element with a high-speed cache, list processor, and locking functions that provides high performance random access to data for one system image or data that is shared among system images in a sysplex. With I/O operations you can see standalone coupling facilities. It handles them as control units with up to eight devices, all defined by the user. With SA z/OS system operations, you can display the status of coupling facilities from a single system's point of view or you can display sysplex-wide status.

Sysplex Timer

An IBM unit that synchronizes the time-of-day (TOD) clocks in a multiprocessor or in processor sides. External Time Reference (ETR) is the generic name for the IBM Sysplex Timer® (9037).

Logically Partitioned (LPAR) Mode

A processor with the Processor Resource/Systems Manager™ (PR/SM™) feature that can be divided into partitions with separate logical system consoles that allocates hardware resources among several logical partitions. (It is called *logical* because the processor is not physically divided, but divided only by definition.) The partitions are defined, monitored, and activated separately by processor operations.

A processor that does not use logical partitions is in "basic mode".

Communications Links

Links that connect the focal point processor to target processors so that commands, messages, and alerts can flow. For more information refer to "Defining System Operations Connectivity" on page 63.

NetView Connection (NVC)

SNA-based communication between the processor operations focal point and the operator control facility (OCF), which runs on the Support Element (SE). For this connection, processor operations uses the NetView RUNCMD interface and the NetView FOCALPT command.

SNMP

Alternative to NetView connections, SNMP may be chosen as the protocol for communications between the processor operations focal point and the OCF of an SE.

See also "Understanding the Processor Operations SNMP Interface" on page 38.

BCP Internal Interface

For processor hardware automation in a sysplex environment, this link allows an OS/390 or z/OS system directly to communicate with the OCF of its own hardware SE, as well as the OCFs of other hardware SEs which are part of a cluster of processors. This cluster must be defined to the Master HMC in a processor environment. If a sysplex processor hardware is to be automated, the processor hardware of all sysplex members must be defined to the Master HMC.

See also "Understanding the BCP Internal Interface" on page 37.

NetView RMTCMD Function

A connection that allows communication between the target and focal point system in order to pass status changes to the focal point system. This communication method is also used for other purposes.

TCP/IP

For VM second level system automation, this link allows SA z/OS ProcOps to communicate with the ProcOps Service Machine (PSM) on the VM host of the second level systems.

See also "Understanding the TCP/IP Interface" on page 39.

Control Units (CU)

Control units are hardware units that control input/output operations for one or more devices. You can view information about control units through I/O

operations, and can start or stop data going to them by blocking and unblocking ports. For example, if a control unit needs service, you can temporarily block all I/O paths going to it.

I/O Devices

Input/output devices include hardware such as printers, tape drives, direct access storage devices (DASD), displays, or communications controllers. You can access them through multiple processors. You can see information about all devices and control paths to devices. You can vary devices or groups of devices online or offline.

NetView Management Console (NMC)

A NetView function that consists of a graphic series of windows controlled by the NetView program and that allows you to monitor the SA z/OS enterprise interactively. The NetView Management Console consists of an NMC server and an NMC client.

The NMC client is connected to the NMC server which communicates with NetView. The NetView Management Console (NMC) can be implemented with an optional client, either on the server or separately.

Planning the Hardware Interfaces

This section provides additional information about the processor hardware interfaces supported by SA z/OS.

Understanding the BCP Internal Interface

In order to allow the sysplex-wide activation or deactivation of the coupling facilities and to control sysplex members leaving the sysplex, SA z/OS uses the BCP (Basic Control Program) internal interface. The BCP internal interface of the following processor hardware families is supported:

- zSeries
- CMOS-S/390 G6
- CMOS-S/390 G5

Using the BCP internal interface from MVS allows you to send hardware operationscommands such as SYSTEM RESET, or ACTIVATE to the Support Element attached to its own processor hardware (CPC). If the CPC is configured in LPAR mode, the operations command can be sent to all logical partitions defined on the CPC.

Furthermore, with the enhanced sysplex functions of SA z/OS, sysplex members running on other CPCs than their own image can be controlled through the BCP internal interface. This is possible by defining all CPCs of your sysplex on the master HMC of your processor hardware LAN.

The following processor hardware can be controlled as a target with the BCP internal interface from the above listed processors, but cannot use the SA z/OS BCP internal interface to control itself or other processors:

- CMOS-S/390 G4
- CMOS-S/390 G3

At the processor hardware LAN level, the BCP internal interface uses the SNMP transport protocol. For this reason, the Support Elements need to be customized for SNMP. One HMC in the processor LAN must be configured to be the Change Management Master HMC, otherwise routing between the own SE and other SEs will not work.

Note that the MVS/HCD function uses the BCP internal interface to update IOCDS and IPL information in the Support Elements of addressed CPCs. You cannot use SA z/OS to perform these tasks, nor can HCD be used to perform the hardware operations functions of SA z/OS.

Currently, the BCP internal interface cannot be used by the processor operations focal point application. The interface can be configured and used for Parallel Sysplex automation purposes only.

Understanding the Processor Operations SNMP Interface

Using the SNMP interface of processor operations, you can monitor and control local or remote processor hardware from a processor operations focal point NetView in an IP network environment. This is different to the BCP internal interface, which allows mutual hardware control among sysplex members without a system network dependency.

With the processor operations SNMP interface, the following processors can be managed:

- zSeries
- CMOS-S/390 G1 through G6
- Multiprise® 3000
- Multiprise 2000
- Application Starter Pak

As with the BCP internal interface, its purpose is to support the OCF commands (for example, ACTIVATE, SYSRESET) provided by the processor hardware.

The Support Elements of the CPCs you want to control must be configured for SNMP. Alternatively, you can configure a single HMC instead of multiple Support Elements in your processor LAN environment for SNMP. On this HMC the CPCs you want to control must be defined. Multiple HMCs, SEs, or both can be defined in your SA z/OS configuration.

Because this interface uses the IP network for communication between the processor operations focal point and the SEs or HMCs, the TCP/IP UNIX System Services stack is required to be active on the processor operations focal point system.

Understanding the NetView Connection (NVC) of Processor Operations

Using the NVC interface of processor operations, you can monitor and control local or remote processor hardware from a processor operations focal point NetView in an SNA network environment. With a NVC, the Support Elements must be configured with a valid CPC SNA address. At least one HMC in your processor hardware LAN, where the addressed CPCs are defined, must have a Problem- and Operations Management SNA gateway defined.

As with the other interfaces, a NVC connection can be used to perform OCF requests supported by the processor hardware. The following processor hardware can be configured for NVC:

- zSeries
- CMOS-S/390 G1 through G6
- Multiprise 3000
- Multiprise 2000
- Application Starter Pak

Understanding the TCP/IP Interface

Using the TCP/IP interface of Processor Operations, you can monitor and control VM guest systems from a Processor Operations focal point NetView in an IP network environment.

Processor Operations communicates with the ProcOps Service machine (PSM) using TCP/IP. The PSM can be regarded as an HMC or SE substitute for the virtual machines. The PSM itself uses the VM/CP Secondary Console InterFace (SCIF) facility to communicate with the single VM second level systems.

The TCP/IP UNIX System Services stack is required to be active on the Processor Operations focal point system.

Deciding Which Hardware Interface to Use

If you want to use the Parallel Sysplex enhancements of SA z/OS and you have configured your customization to use IXC102A message automation, the BCP internal interface is required.

Note, that this interface can coexist with the supported SNMP and NVC interfaces on a processor operations focal point system. Because the IXC102A automation, which is part of the Parallel Sysplex XCF automation, can also be performed in SA z/OS using proxy resources together with processor operations, a decision must be made, which automation to use. It is recommended to use the XCF automation based on the BCP internal interface and to disable the IXC102A proxy resource automation based on processor operations.

The following criteria are important for planning which processor hardware interface you can use with processor operations:

- Processor hardware LAN
- Processor hardware type

Only if your processor hardware LAN is token-ring you can use NVC. SNA based NetView connections with an Ethernet LAN are not supported by the Support Elements. However, a token-ring based processor LAN can be used for both NVC and SNMP connections. If your processor hardware LAN has an Ethernet LAN, SNMP must be used.

From the list of the supported processor hardware, only the zSeries models z900 and z800 support SNA based NetView connections. Later zSeries hardware models will support SNMP connections only.

Using SA z/OS Partitioned Data Sets

You must be aware of the restrictions involved in the use of partitioned data sets by SA z/OS and NetView. This section provides information on:

- "Allocating SA z/OS Partitioned Data Sets"
- "Using LNKLSTxx (Link Library List)" on page 42
- "Sharing Data Sets" on page 42

Allocating SA z/OS Partitioned Data Sets

After you have completed the SMP/E installation of SA z/OS, you need to allocate data sets to hold your locally customized members. These data sets are concatenated in various data definition (DD) names in the NetView startup procedure. You may need data sets for the DSIPARM, DSIMSG, DSICLD, DSILIST, CNMPNL1, STEPLIB, and DSIPRF concatenations.

There are two types of customization that you may perform:

- "Domain-Specific Customization"
- "Enterprise-Specific Customization" on page 41

Domain-Specific Customization

SA z/OS DSILIST

This data set holds the Automation Table (AT) load protocol. When ATs are loaded that were generated by the SA z/OS build process, a load protocol is stored in the DSILIST data set. This protocol is required to inspect the AT loaded as INGMSG02.

This can be controlled by the AOFMATLISTING advanced automation option (AAO).

For details about the AT build process, refer to *IBM Tivoli System Automation for z/OS Customizing and Programming* and *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

SA z/OS DSIPARM

This data set holds SA z/OS NetView definitions that are specific to this NetView. You may need it only for the DSIPARM concatenation. It should contain the CNMSTYLE specifications that define this domain and a suitably customized AOFMSGSY member.

For your gateway definitions and your alert forwarding related to NMC, the updated DSIDMNK member should be included. Depending on your NMC setup, it should contain your NMC specifications like the INGTOPOF file and the corresponding BLDVIEWS members. For information about this customization, see *IBM Tivoli System Automation for z/OS Customizing and Programming*.

Note: For NetView 5.1 and above DSIDMNK entries have been moved to CNMSTYLE.

If you plan to use the Kanji support make sure that you update the member CNMSTYLE:

- `transTbl =DSIKANJI` must be specified in CNMSTYLE
- `transMember =CNMTRMSG` must be uncommented in CNMSTYLE.

For more details, refer to the chapter *"Installing the National Language Support Feature"* in *Tivoli NetView for z/OS, Installation: Configuring Additional Components*.

Enterprise-Specific Customization

SA z/OS ACF

This data set holds the various automation control file fragments and control file fragments for the automation manager needed by the SA z/OS instance on this NetView. It is not recommended that you build your SA z/OS policy databases directly into this data set. Changing your active SA z/OS policy is a process that should be under change control.

Consequently it is recommended that you allocate a separate partitioned data set for your policy database, your ACF fragments created from the ISPF dialogs BUILDF process and the enterprise wide ACF fragments data set specified to the automation manager.

Notes:

1. If the automation agent and the automation manager use different data sets they must have the same name.
2. INGAMS refreshes GDG data sets by resolving these to absolute data set names during dynamic allocation.
3. It is highly recommended that the ACF data set is not placed into the DSIPARM concatenation. The reasons for this are as follows:
   a. The same data set must be specified to the automation manager.
   b. The DSIPARM data set cannot be changed without stopping and starting all agents within the sysplex.
   c. If you use INGAMS to refresh your configuration and you specify another data set, dynamic allocation will take place, the data set allocated to DSIPARM is ignored. The control file you see with NetView browse will not match the control file used by the automation manager.
   d. GDG versions are resolved at runtime by the automation manager, while the automation agent receives the complete data set name at NetView startup. If a different GDG version is allocated to DSIPARM, dynamic allocation takes place. Again, the control file you see with NetView browse will not match the control file used by the automation manager.
4. If you use MEMSTORE to load the NetView PDS members in storage (this is the default in NetView 1.4) and you do not reload the members after an ACF build, you will get message `AOF618I ... ACF Token mismatch ...` due to an INGAMS command to refresh the configuration.

SA z/OS CREXX

Compilation of SA z/OS REXX code is optional and supported. If you choose to compile the CLISTs in the SA z/OS SMP/E target data set, this is where the compiled versions should be placed. It is needed only in the DSICLD concatenation for system operations and processor operations REXX CLISTs. If you have compiled I/O operations execs, then the data set with these compiled execs must be in the SYSEXEC concatenation.

Note: If you use this data set, you can omit the SA z/OS SMP/E target data set in your DSICLD concatenation, because all the code is in it as well.

SA z/OS Libraries
This contains data set members shipped with SA z/OS. It can either be the real SMP/E data set or a locally made copy. If you must change the contents of any SA z/OS part, copy the member from the SMP/E target data set to an SA z/OS enterprise-specific or domain-specific data set, and edit it there. By keeping the contents of this data set as shipped, you make it much safer to apply SMP/E maintenance to its members, because SA z/OS fixes will not overwrite your enterprise-specific modifications.

Using LNKLSTxx (Link Library List)

If you have put the NetView and SA z/OS data sets into your LNKLST concatenation, rather than into STEPLIB, they must be in the following sequence: the SA z/OS ones before the NetView ones.

Sharing Data Sets

By using shared DASD, you are able to reduce the DASD required to store the data sets, but this exposes you to additional risk. With shared DASD you have only one copy of the data sets. As a result, if that DASD volume becomes unusable, you lose access to the data set on ALL the systems that were sharing it. In a large sysplex this may represent a significant operational exposure.

One solution is to have a set of standby procedures for SA z/OS. These are copies of your normal SA z/OS procedures that point to a copy of your data set on another DASD volume and preferably on a different string of DASD volumes. Although an instance of SA z/OS started from these procedures would not share status information with the SA z/OS from your primary procedures, the standby procedures let you maintain operability of your systems in the event that your primary procedures are unavailable.

REXX Considerations

Allocation Requirements for REXX Environments

Before running SA z/OS you may need to change the maximum number of REXX environments allowable.

The recommended starting point is 400 concurrent REXX environments for the address space of your SA z/OS. Different SA z/OS configurations may require more REXX environments.

The number of REXX environments allowable is defined in the REXX environment table. See *z/OS TSO/E Customization* for more information. TSO/E provides a SYS1.SAMPLIB member called IRXTSMPE, which is an SMP/E user modification to change the maximum number of language processor environments in an address space. Define the number of allowable REXX environments on the IRXANCHR macro invocation:

```
IRXANCHR ENTRYNUM=401
```

Install the user modification by following the instructions in *z/OS TSO/E Customization*.

Changing NetView REXX Environment Usage Characteristics

It is recommended that you change some of the NetView REXX environmental usage defaults. This can be done using the NetView DEFAULTS or OVERRIDE commands with the REXXENV and REXXSLMT parameters.

REXXENV
This is the number of REXX environments that each task "hangs onto" when it has finished with them. The default is 10, but 3 usually gives quite satisfactory performance.

REXXSLMT
This is the limit on the total amount of storage that NetView is allowed to allocate for REXX environments. The default is unlimited, but 800K usually gives satisfactory performance. If you use many locally written REXX, you may wish to use a larger value.

See *Tivoli NetView for z/OS Automated Operations Network User's Guide* for details of the DEFAULTS and OVERRIDE commands.

z/OS Considerations

SYS1.PARMLIB Member Suffix

The xx suffix on each SYS1.PARMLIB data set member can be any two characters chosen to match your IEASYS naming scheme. Before starting installation allocate a suffix for SA z/OS, checking that this suffix is not already in use. See *z/OS MVS Initialization and Tuning Reference* for information about IEASYS.

Defining the XCF Group

In order to be able to communicate in certain situations, the automation manager instances and the automation agents belonging to one sysplex must be members of one and the same XCF group. The name of this group consists of a fixed main part and a variable suffix; the format is `INGXSG`*xx*. The suffix must be specified separately for the manager and the agents. For the automation manager, it is specified in the HSAPRM*xx* member of SYS1.PARMLIB (see "Step 10A: Customizing HSAPRM*xx*" on page 115); for the automation agents, it is defined in the INGXINIT member of DSIPARM (see "INGXINIT" on page 102).

Systems with SA z/OS NetView instances belonging to the same XCF group must be defined in the Customization Dialogs in the same Group Policy Object of type sysplex. For details refer to the *"Group Policy Object"* chapter in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Note that SA z/OS NetView instances belonging to the same XCF group must reside on different systems. Thus, when you run an SA OS/390 2.2, SA z/OS 2.3, or SA z/OS 3.1 agent and an instance of msys for Operations on the same system, they must not belong to the same XCF group.

Using SA z/OS Subplexes

You can divide your real sysplexes into several logical SA z/OS subplexes (an example is shown in Figure 2 on page 44). To do this you must define a specific XCF group suffix and a specific group policy object for each subplex. Each SA z/OS subplex must have its own automation manager running. Using SA z/OS subplexes you can run automation on systems of sysplexes like on single systems. This is required if you do not have shared DASDs for all your systems in the sysplex.

The group ID must be defined in an HSA parmlib member or INGXINIT for NetView.

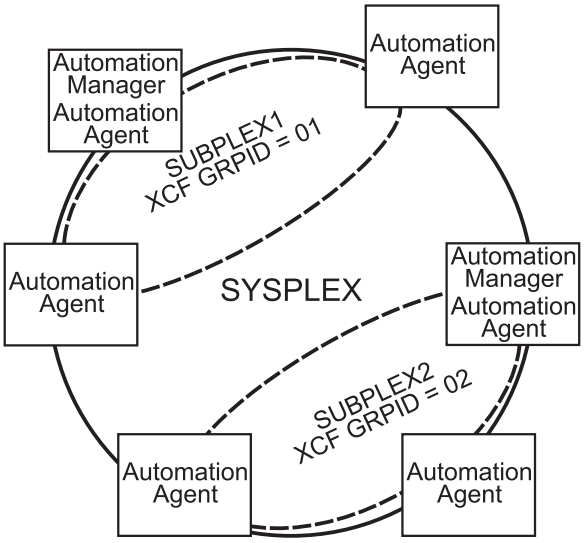

Figure 2. Using SA z/OS Subplexes

NetView Considerations

NetView ships two sample automation operators, AUTO1 and AUTO2. SA z/OS assumes that these tasks are available and have not been renamed. If they have been renamed, you must change the names in AOFMSGSY and CNMSTYLE residing in the DSIPARM data set.

In CNMSTYLE, change every occurrence of AUTO1 and AUTO2 to the autotask names you are using.

```
AUTOTASK.AUTO1.Console=*NONE*
AUTOTASK.AUTO1.InitCmd=AOFRANTL AUTO1,AUTO2
function.autotask.primary = AUTO1

AUTOTASK.AUTO2.Console=*NONE*
AUTOTASK.AUTO2.InitCmd=AOFRAAIC
```

It is recommended that you have system operations and processor operations installed together on the status focal point system.

Automation Manager Considerations

This section presents automation manager considerations relevant to the installation process. For automation manager concepts that are of interest from an operator's point of view, refer to *IBM Tivoli System Automation for z/OS User's Guide*.

The automation manager is introduced as a separate address space. An installation requires one primary automation manager and may have one or more backups. The automation manager is loaded with a model of the sysplex when it initializes. It then communicates with the automation agents in each system, receiving updates to the status of the resources in its model, and sending orders out to the agents as various conditions within the model become satisfied.

A series of substeps is required to get the automation manager up and running for your SA z/OS installation. These installation steps are described in this documentation, but are not identified as being specific automation manager installation steps.

Only the default installation of UNIX System Services is a prerequisite for the automation manager. No hierarchical file system (HFS) or UNIX shell is required.

The automation manager must be defined by RACF (or an equivalent security product) as a *super user* for UNIX System Services. The user that represents the started tasks in your installation must be authorized for the OMVS segment.

Note: The system on which the automation manager should be started must be defined as policy object *System* in the policy database that will be used to create the automation manager configuration file that this automation manager uses (see also "Step 17A: Build the Control Files" on page 129).

Considerations when using MIM instead of GRS:
If you are using MIM instead of GRS, be careful with mimplexes that extend beyond the sysplex. These can cause automation manager initialization to fail due to ENQ contention. Using different GRPIDs for each sysplex within the mimplex can resolve this problem.

Storage Requirements

When the automation manager is started, it needs a constant amount of storage of 56 MB plus a variable part that depends upon the number of resources to be automated.

The constant part consists of 40 MB for the automation manager code and 16 MB for history information. The rule of thumb for the variable part is *n* * 8 KB where ***n*** is the number of resources.

The sum of storage requirement according to the rule of thumb is:

40 MB + 16 MB + *n* * 8 KB

This formula covers the maximum storage requirements. However, the storage requirements does not increase linearly with the number of automated resources. Real measurements may be smaller than values retrieved with the rule of thumb formula.

OMVS Setup

Because the automation manager requires OMVS, OMVS must be customized to run without JES. (This means that OMVS should not try to initialize colony address spaces under the JES subsystem as long as JES is not available.) Therefore the definitions in the BPXPRM*xx* member must match *one* of the following:

- Either all FILESYSTYPE specifications with an ASNAME parameter are moved into a separate BPXPRM member. This can be activated via the automation policy by using the SETOMVS command after the message BPXI004I OMVS INITIALIZATION COMPLETE has been received.
- Or the parameter 'SUB=MSTR' is added to the ASNAME definition, for example:

```
/*****************************************************/
/* ZFS   FILESYSTEM                                  */
/*****************************************************/
  FILESYSTYPE TYPE(ZFS) ENTRYPOINT(IOEFSCM)
        ASNAME(ZFS,'SUB=MSTR')
```

Note: In order to initialize without JES, the Automation Manager needs to be defined as a superuser. If you use an OEM security product that does not initialize until JES has initialized, then superuser authority cannot be evaluated until JES is up and consequently JES cannot be started by SA z/OS.

Recovery Concept for the Automation Manager

For sysplex-wide and single-system automation, the continuous availability of the automation manager is of paramount importance.

To ensure the automation manager's functionality as automation decision server, the primary automation manager (PAM), must be backed up by additional automation manager address spaces called secondary automation managers (SAMs). Secondary automation managers are able to take over the function whenever a primary automation manager fails.

Therefore, it is recommended that you have at least one secondary automation manager running. For sysplex-wide automation, the SAM should run on a different system than the PAM.

To enable software or hardware maintenance in the sysplex, SA z/OS supports a command to force the takeover of the primary automation manager.

A takeover is only possible when the following requirements are met:

- All the automation manager instances must have access to a shared external medium (DASD) where the following is stored:
  - The configuration data (result of the ACF and AMC build process).
  - The schedule overrides VSAM file.
  - The configuration information data set — this is a mini file in which the automation manager stores the parameters with which to initialize the next time that it is started WARM or HOT.
  - The takeover file.
- If MQSeries is used for communication between the automation manager and the automation agents (see "Manager-Agent Communication and Status Backup" on page 47), all of the automation manager instances must have access to the coupling facility that contains the automation status queue.
- If MQSeries is used for communication between the automation manager and the automation agents, the automation agents must have access to the coupling facility that contains the agent and the workitem queues.

SA z/OS follows the concept of a floating backup because:

- The currently active automation manager has no awareness of the existence (and location) of possible backup instances.
- The location of the backup instances can change during normal processing without any interruption for the active automation manager.
- There is no communication between the primary automation manager and its backup instances during normal operation except when a SAM that is to become the new PAM informs the current PAM of that fact during a planned takeover.

This has the advantage that in normal operation, the processing is not impacted by a backup structure which can change.

Depending on the number of resources, the takeover time from a primary to a secondary automation manager is in the range of one to two minutes.

Figure 3 shows the configuration of automation manager recovery. The data required for a restart is externalized on a shared I/O device.

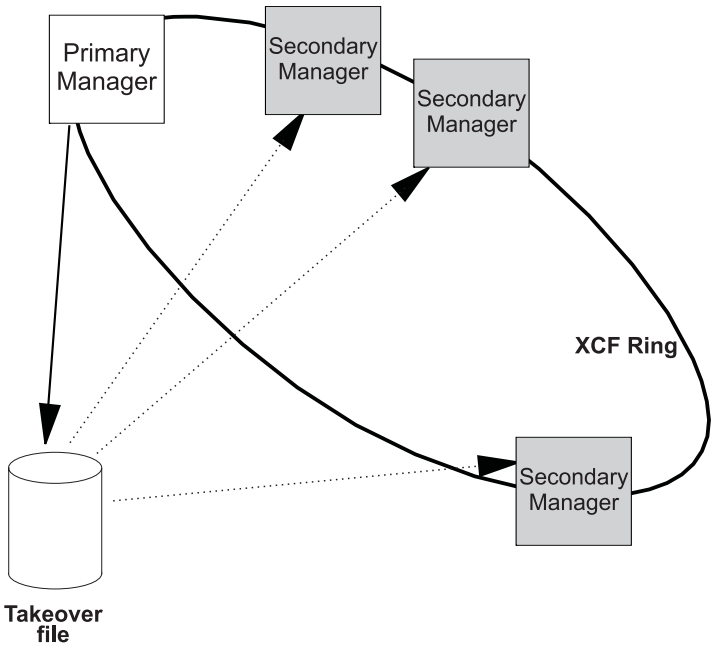

Figure 3. Recovery Concept for the Automation Manager

Manager-Agent Communication and Status Backup

SA z/OS provides two options for establishing communication between the automation manager and the automation agents, and keeping a backup copy of the status of the automated resources:

- Using MQSeries V5R3 queues for both communication and backup
- Using XCF for communication and a VSAM data set (the takeover file) for backup

For the MQSeries solution, you need MQSeries V5R3 or higher, and also DB2 in data sharing mode. MQSeries V5R3 is required because the PAM and the SAMs must share the queues; this data sharing capability, which is implemented by means of coupling facility list structures, is shipped with MQSeries V5R3. DB2 is required because it serves as the repository for the definitions of the shared queues.

Note: SA z/OS also supports a local system environment with MQSeries V2R1. In that case, DB2 is not required, but the scope of automation is limited to a single system.

Exploiting MQSeries V5R3

If you choose the MQSeries option, the automation manager communicates with the automation agents through two MQSeries queues, and uses a third MQSeries queue for status backup:

- **Workitem Queue:** This queue is the inbound queue for the automation manager. The automation agents put their requests or queries in the form of a workitem into this queue. Its name is WORKITEM.QUEUE.
- **Agent Queue:** This queue is the outbound queue of the automation manager. All orders for the automation agents that result from a request (a workitem) sent to the automation manager are placed in this queue by the automation manager. The automation agents then pick up the orders from this queue for execution. Its name is AGENT.QUEUE.
- **Automation State Queue:** This queue is only used by the automation manager. It is used to save the current state as well as other information about the resources managed by the automation manager. It is the *automation state queue* that allows SA z/OS to perform a hot takeover, because this queue always contains a consistent image of the resource data that the PAM maintains in storage. Any updates that are made to the resources are also reflected in the automation state queue. Its name is STATE.QUEUE.

The transactional behavior of MQSeries ensures that these three queues are always consistent. A change in any queue is only committed after the corresponding changes have also been made in the other two queues. Thus, for example, the deletion of a workitem from the Workitem Queue is only committed when:

- The resulting orders to the agents have been written to the Agent Queue, and
- The resulting state changes of the affected resources have been written to the Automation State Queue.

Figure 4 shows how the queues interact with the automation manager and the automation agents.

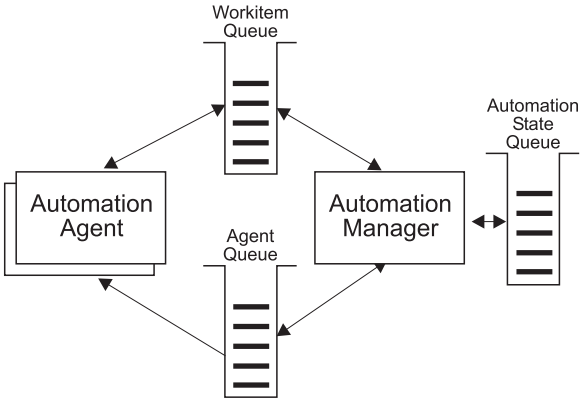

Figure 4. MQSeries Queues

The three queues are shared between the PAM and the secondary automation managers (SAMs). When the PAM fails, an SAM becomes the new PAM and takes over the shared queues in a consistent state. No requests are lost because both the actual state of the automated resources, and also the unprocessed requests (workitems) – even those that were made during the takeover phase – and all unprocessed orders for the automation agents are known. Only the execution time may be delayed.

When you use MQSeries for manager-agent communication and status backup, it is recommended that you automate MQSeries and let it be started and stopped by SA z/OS. Collecting all the MQSeries and DB2 instances in a basic group allows you to monitor these prerequisites of SA z/OS as you would do with normal application automation.

Automation of MQSeries by SA z/OS implies that MQSeries is not yet available when the automation manager is started. In this situation, the automation manager will communicate with the automation agents through XCF services until it has started its local MQSeries. This phase is called the *startup phase*. As soon as MQSeries is up, the automation manager switches over to MQSeries for communication with the automation agents and for status backup. This means that both the SA z/OS automation manager and automation agents are now MQSeries applications.

Similarly, when the PAM has shut down its local MQSeries, and there is no SAM left for a takeover, the PAM will switch back again to XCF communication. This phase is called the *shutdown phase*.

During these "MQSeries-less" phases, resources can change their status, and the information about these changes should be preserved for an eventual successor of the actual PAM. This applies not only to a shutdown and subsequent restart of SA z/OS, but also to a failure of the PAM and a subsequent takeover by a SAM during the startup phase. To this end, SA z/OS maintains a *takeover file*.

The Takeover File: Every status change during the startup and shutdown phase of SA z/OS is recorded in the takeover file. The information in this file is kept consistent by maintaining two compartments for each resource record. These compartments are used alternately to store the changes. This ensures that a consistent and reasonably current version of the resource information exists even when the PAM fails in the middle of an update of the takeover file.

If the PAM fails during startup, a SAM becomes the PAM as before. But now, the new PAM reads the takeover file and starts with the information contained in it. When the shutdown phase is terminated normally or abnormally, the takeover file will be used for a restart of SA z/OS. In this way, a hot takeover or restart is possible even when MQSeries is not available. This of course requires that the takeover file be shared between the PAM and the SAMs.

If a VSAM I/O error occurs during the hot start or takeover, this causes the PAM to initialize with a warm start rather than a hot one. If a VSAM error occurs, you will be notified and asked to choose one of the following options:

- Retry reading the takeover file.
- Continue with a warm start.
- Cancel the hot start and trigger a takeover.

It is also possible that a VSAM I/O error might occur while the PAM is running that causes the PAM to disable recovery of the state information. This now leads to the following behavior:

1. The in-storage state information is not written to the takeover file when the PAM terminates.
2. A WTOR is sent to the operator to enable the takeover file, so that the previous version is used.

Figure 5 on page 50 shows the timeline for the MQSeries solution when MQSeries is automated by SA z/OS.

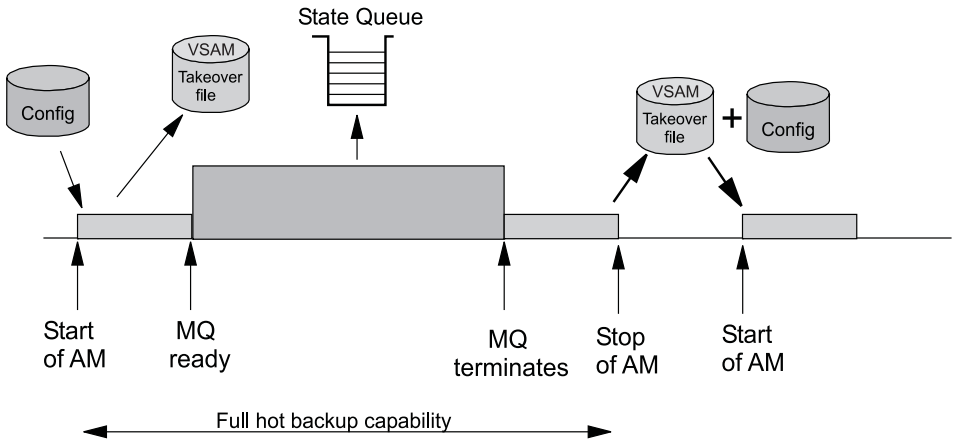

Figure 5. Automating MQSeries with SA z/OS

The sequence of events is as follows:

1. During the startup phase, when MQSeries is not yet running, the PAM uses XCF for communication and stores every status change in the takeover file.
2. If the PAM or its system fail during the startup phase, an SAM becomes the new PAM. The new PAM reads the actual state of the automatable resources from the takeover file. (Note that this is not represented in Figure 5.)
3. As soon as MQSeries is up, the PAM switches to MQSeries and writes the status updates into the Automation State Queue.
4. If the PAM or its system fail while MQSeries is running, an SAM becomes the new PAM. The new PAM uses the information in the shared MQSeries queues. (Note that this is not represented in Figure 5.)
5. When the PAM has shut down its own local MQSeries, the reaction of SA z/OS depends on whether an SAM is available:
   - If there are any SAMs, one of these becomes the new PAM. (Note that this is not represented in Figure 5.)
   - If there are no SAMs, the current PAM enters the shutdown phase. It switches back to XCF and the takeover file.
6. During the shutdown phase, the PAM stores every status change in the takeover file. After the PAM has terminated normally or abnormally, the information in the takeover file will be used for a restart of SA z/OS.

Note: The takeover file substitutes for the Automation State Queue when MQSeries is not available. There are, however, no corresponding substitutes for the Workitem Queue or the Agent Queue. Therefore, all pending work items and orders to the automation agents will be lost when the PAM fails during the startup or shutdown phase.

For this reason, you should keep the startup phase as short as possible, and define your automation policy so that the local MQSeries manager (local for the PAM) and its associated DB2 are started simultaneously immediately after JES is up.

The following section contains an overview of various recovery scenarios.

Some Problem Scenarios and How SA z/OS Reacts: The following are some examples of how SA z/OS reacts when there is a:

System Breakage with Running Automation Manager and Automation Agent
A waiting secondary automation manager will automatically take over the responsibility of the failed primary automation manager. Of course the broken automation agent is not moved, because all the broken resources have gone anyway. However the new automation manager will detect the system collapse and react accordingly.

An Automation Manager Breakage
A waiting secondary automation manager or the ARM-restarted primary automation manager will automatically take over the responsibility.

A MQSeries Manager Breakage
A connected automation agent will wait for the ARM-initiated MQSeries manager restart. A connected automation manager will automatically trigger a takeover in the case of active processes, otherwise this automation manager will also wait. Note that even in the case of a MQSeries manager abend or problem, the automation agent is still able to perform message automation.

A DB2 Problem or Breakage
After DB2 first comes up and SA z/OS has been able to access the MQSeries queues for the first time, DB2 is actually no longer needed. Therefore any of these cases can be completely automated even in the full MQSeries-supported fashion.

A CF Outage
At this point in time, SA z/OS will automatically restart its automation processing from the existing static configuration (WARM start).

A Takeover Resulting in the Same Problem
When the new automation manager detects that a workitem has been rolled back twice, the process will be stopped and a WARM initialization will be triggered, thus preventing endless retries failing with the same persistent problem.

MQSeries Queue Problems
See chapter “MQSeries Exception Processing” on page 52.

MQSeries Considerations

This section assumes that you have selected MQSeries for manager-agent communication and status backup.

Peer Recovery Considerations: Refer to the MQSeries V5R3 documentation for all aspects of MQSeries sysplex-wide peer recovery. Because SA z/OS exploits this technology, you also gain this functionality. The following are important considerations when planning for SA z/OS to be a MQSeries shared queues exploiter.

The basic setup consideration is whether or not you choose to have a dedicated MQSeries QSG (Queue Sharing Group) just for SA z/OS.

Peer recovery requires that a failed MQSeries instance should be restarted using either the z/OS Automatic Restart Manager or SA z/OS itself.

To roll back or complete the broken automation manager activities (*UOW*s in MQSeries terminology), MQSeries can use a different MQSeries manager instance of that QSG (Queue Sharing Group).

SA z/OS will ensure that all pending work has been rolled back before the new primary automation manager starts accessing the queues.

There are no special considerations for DB2 should there be a takeover. DB2 is not involved in the MQSeries peer recovery functions.

Because SA z/OS provides the capability to automate its prerequisites, SA z/OS may be used initially to start MQSeries and DB2. z/OS Automatic Restart Manager or SA z/OS may be used to restart the MQSeries instances, and SA z/OS can be used to observe the status of its prerequisites as well as finally to stop it.

Collecting all the MQSeries and DB2 instances in a basic group allows you to monitor all SA z/OS prerequisites as you would do with normal application automation.

MQSeries Exception Processing: MQSeries services may fail. Assuming that the MQSeries setup and queue definitions are correct, there is still a chance of running into a MQSeries exception. Basically, these exceptions can be categorized into:

- **Recoverable errors** — these can be recovered by running the failed MQSeries service again after a certain time.
- **Unrecoverable errors** — these cannot be recovered automatically.

The automation agents will react to unrecoverable exceptions by disconnecting from either the MQSeries manager or MQSeries queue. However the sysplex communication task will not be stopped. It will continuously try to re-establish the broken connection.

The automation manager will trigger a takeover if there is a local MQSeries manager problem with active transactions.

Problems with the Automation State Queue are handled differently. A takeover should be avoided if possible, because it probably cannot be successfully completed. For cases where this is possible the queue will be closed and GET/PUT disabled. Message INGY1107 is then issued. Processing on the automation manager continues because the data is still in storage. You then have the chance to repair the queue, for example by:

- Redefining the queue on a different CF
- Redefining the queue on a different CF Structure
- Increasing the maximum number of possible messages.

The current automation manager will continuously monitor whether there is a new Automation State Queue that has both GET and PUT reenabled. If this automation manager finds a queue with this attribute it will try to reinstall the queue. Having done this, SA z/OS is fully recoverable again.

Queue Full Considerations: MQSeries queues can become full. No further MQPUTs are possible unless some MQGETs remove messages.

The current active SA z/OS automation manager automatically performs the recovery from a queue full condition. It can be considered as a recoverable exception as described above.

Situations where a queue full condition can occur are:

1. For the Workitem Queue:

- An automation manager is not available to pick up the workitem requests (for example, it has just stopped or is restarting).
- An automation agent-based automation CLIST repetitively sends requests to the automation manager. Because these automation manager requests can be generated by an automation program, this program may loop.

2. For the Agent Queue:
   - Automation agents are not available or able to process orders or responses in time.
   - Many concurrent large response blocks.
3. For the Automation State Queue:
   - Dynamic Configuration Reloads drastically increase the amount of Automation State information.

The samples delivered with SA z/OS combined with a healthy system should not result in such a situation. It is more an indication that something is wrong but SA z/OS tries its best to survive.

The recovery action for an Automation State Queue full condition is described in "MQSeries Exception Processing" on page 52.

For the Automation Workitem Queue and the Automation Agent Queue, three additional message counters have been introduced to act as thresholds:

- **Low Threshold** — if the number of messages is below this limit, operations on that queue are fine, and no recovery actions are taken.
- **High Threshold** — if the number of current active messages reaches this count, recovery actions are taken. To stop this recovery mode again, the number of messages must fall below the low threshold counter.
- **Max_Queue_Depth** — at this time, further MQPUTs are rejected, however SA z/OS would retry.

To see these thresholds, use the INGAMS command that is described in *IBM Tivoli System Automation for z/OS Operator's Commands*.

Using XCF only

XCF communication and the takeover file are primarily intended to substitute for the MQSeries queues in certain situations. However, you can also use them permanently and thus dispense with MQSeries altogether. If you wish to do so, you must set the COMM parameter in the HSAPRM*xx* member accordingly; see Appendix F, "Syntax for HSAPRM00," on page 221.

As already pointed out, the work items and orders to the automation agents that are pending at takeover time are not stored in this implementation, so all these pending items will be lost when the PAM fails and a SAM takes over.

Figure 6 on page 54 illustrates the timeline from the start of the automation manager (AM) through to its termination for the following cases:

- A planned stop and start of the automation manager
- An unexpected failure

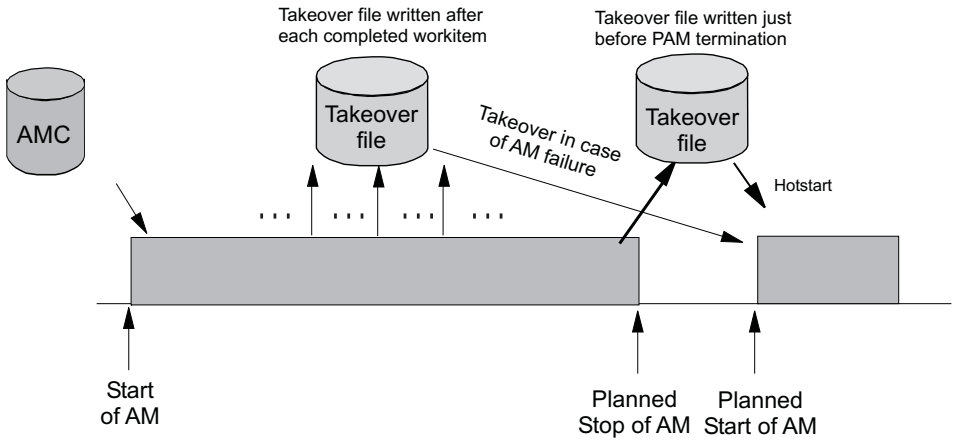

Figure 6. Using Only the Takeover File for Status Backup

Table 13 outlines the various recovery scenarios.

Table 13. Recovery Scenarios

Event	SA z/OS Recovery Action	Comments
PAM fails	SAM runs a takeover	The takeover file contains the state with the last successfully processed workitem
PAM detects a severe error condition	PAM terminates and SAM runs a takeover	The takeover file is used to rebuild the resource object structures in case of a takeover or next hotstart
System with the PAM fails	SAM runs a takeover	The takeover file is used to rebuild the resource object structures in case of a takeover or next hotstart

Chapter 5. Planning to Install TEC Notification by SA z/OS

This section contains information required for the installation of TEC Notification by SA z/OS.

Introduction of TEC Notification by SA z/OS

SA z/OS notification was extended in SA OS/390 2.2 to notify Tivoli Enterprise Console® (TEC) about an automation problem on z/OS by sending an event to the TEC event server.

For this purpose, on z/OS systems, messages or alerts are transformed into Tivoli events and sent to the *TEC event server* that is running on a Tivoli-managed node in your network.

These events in turn may:

- Cause a notification of a Tivoli administrator on the TEC
- Be correlated with other events on the TEC event server
- Result in opening a trouble ticket, for example, dependent on what you programmed at the TEC event server

TEC event server was introduced as a new notification target for SA z/OS. Note that only those messages that indicate critical situations and alerts are forwarded as TEC events to the TEC event server using the appropriate NetView Event/Automation Service Adapter.

A Tivoli administrator who wants to deal with a problem indicated by an event that is forwarded to the TEC event server by SA z/OS needs access to the affected z/OS system. You may use the Tivoli NetView 3270 Management Console for this. With TEC Notification by SA z/OS, the TEC administrator may log on to the NetView operator console by starting the NetView 3270 Management Console from the TEC console by executing a task. See *IBM Tivoli System Automation for z/OS User's Guide* for a description of the graphical interface on how to achieve this.

Note: Forwarding of SA z/OS messages to TEC will not start until SA z/OS and the Event/Automation Service are up and running. SA z/OS messages issued during SA z/OS startup will not be forwarded to TEC.

Environment Configurations

Several products are involved in TEC Notification by SA z/OS:

- ***Tivoli NetView for z/OS***
- ***Tivoli NetView Event/Automation Service***
- ***Tivoli Enterprise Console*** (TEC)

You can run TEC Notification by SA z/OS in two configurations:

- ***local configuration***: The message adapter or alert adapter is running on the same z/OS system on which SA z/OS is also running. The adapters are local to the SA z/OS which is issuing and forwarding messages and alerts to the Tivoli Enterprise Console. Such a configuration for message forwarding is illustrated in Figure 7 on page 56.

- ***distributed configuration***: The message adapter or alert adapter is running on an z/OS system different from the one on which SA z/OS is running and issuing messages and alerts. In this scenario, the z/OS system running the adapters must be the SA z/OS automation focal point system. Such a configuration for message forwarding is illustrated in Figure 8 on page 57.

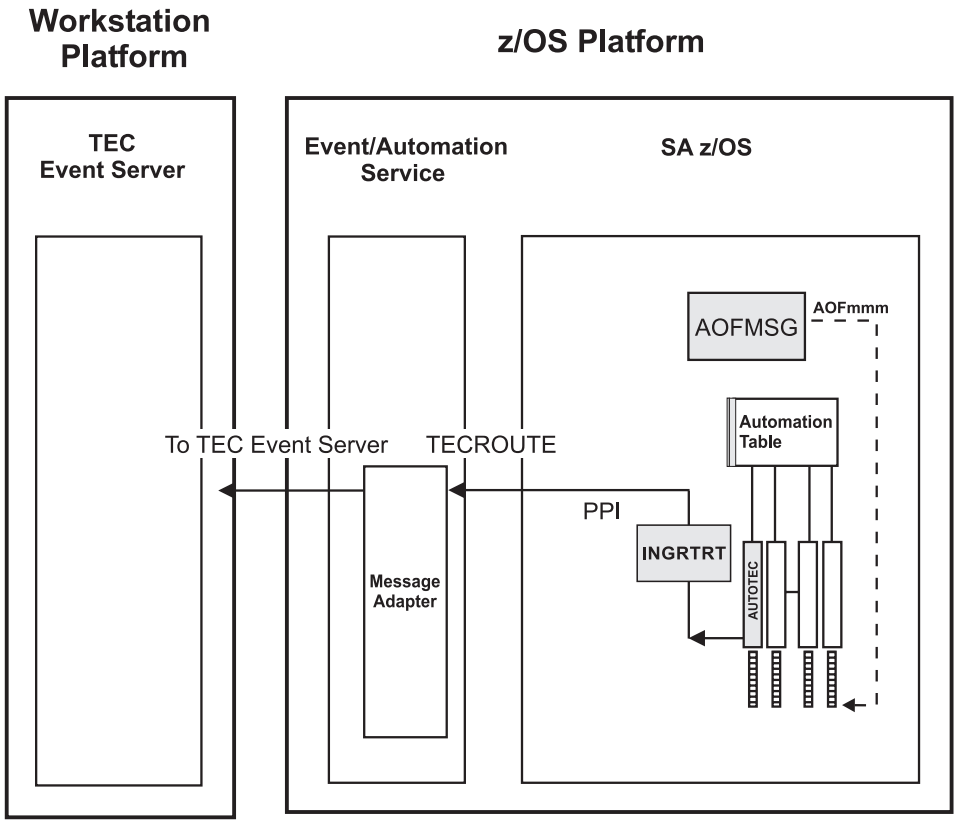

Figure 7. Local Configuration: NetView Event/Automation Service Local to the SA z/OS Source of Messages

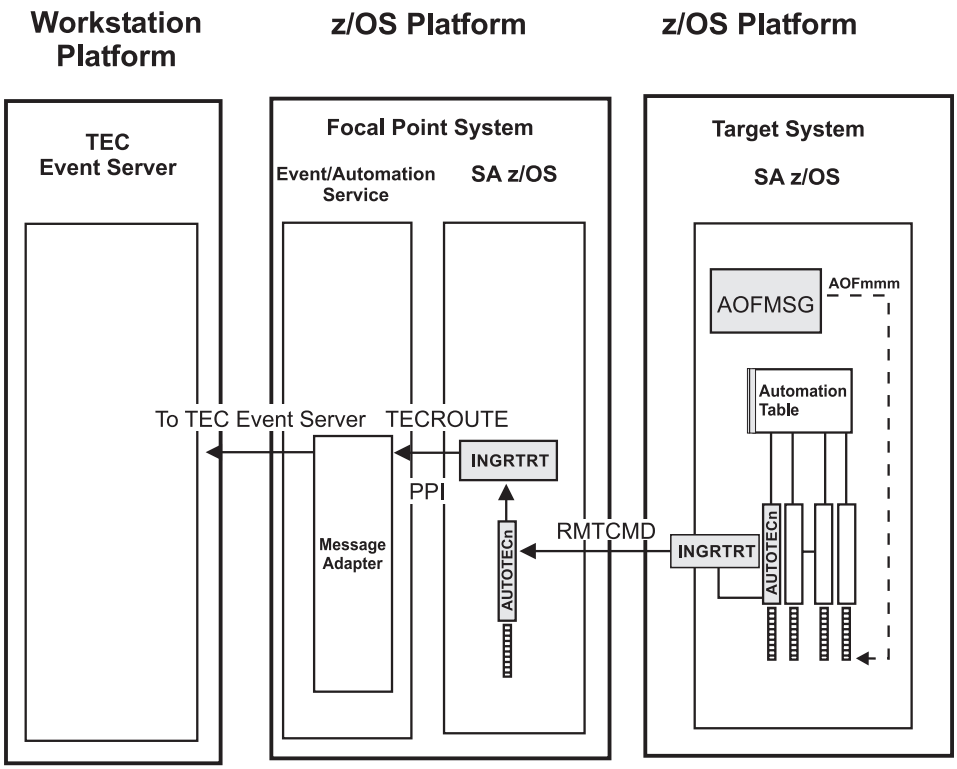

Figure 8. Distributed Configuration: NetView Event/Automation Service Remote to the SA z/OS Source of Messages

Section "Environment Configurations" on page 55 describes the two configurations in which you can run TEC Notification by SA z/OS. How to install this feature is described in the following sections:

- "Installing and Customizing the TEC Event Server Workstation" on page 165
- "Activating the Installed Files" on page 166

The customization part comprises the following steps:

- "Step 15: Customization of NetView for TEC Notification by SA z/OS" on page 125 describes how to customize your SA z/OS and TEC Notification by SA z/OS installations on the z/OS system for both the local and distributed configuration as described in "Environment Configurations" on page 55.
- "Installing and Customizing the TEC Event Server Workstation" on page 165 describes how to install and activate the workstation code on the TEC Event Server.

You can find more conceptual information about TEC Notification by SA z/OS and information on how to use it in *IBM Tivoli System Automation for z/OS User's Guide*.

Chapter 6. Planning for the NMC Environment

The information in this section helps you to plan the configuration of the components in your NMC environment.

NMC Exploitation Topology

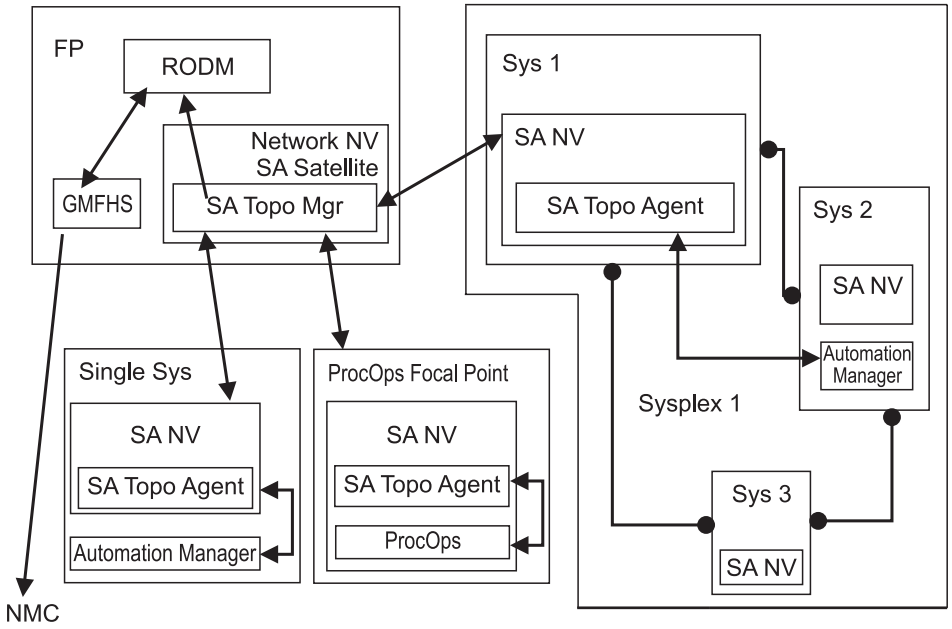

Figure 9. The SA z/OS Environment for NMC Support

Figure 9 shows how in a SA z/OS configuration the involved components communicate to produce graphical output information:

1. At initialization time, the SA z/OS topology manager knows the target systems for automation.
2. The SA z/OS topology manager contacts the SA z/OS topology agents on all sysplexes or stand-alone systems or, for processor operations, it contacts the processor operations focal point to obtain the required information.
3. The SA z/OS topology agents contact the related automation managers or the processor operations component respectively to find out the status from the systems and resources.
4. Then the SA z/OS topology agents report this information to the SA z/OS topology manager on the focal point.
5. The SA z/OS topology manager feeds the RODM data base with the achieved information.
6. The NMC workstation on the operator's request can retrieve the RODM data to produce the defined views.
7. Also, at initialization time, the automation managers get the order to inform the related SA z/OS topology agents whenever status changes occur. Then the SA z/OS topology agents will route the status change information to the SA z/OS topology manager which will update the RODM data base.

Planning to Install the NMC Workstation

Make sure that you have a working NMC environment with the required functions (for example, RODM, GMFHS, NMC Topology Server, NMC Topology Console, NMC 3270 Management console), as part of your NetView installation available.

For information on how to install the NMC, refer to *Tivoli NetView for z/OS Installation: Configuring Graphical Components* and *NetView Management Console User's Guide*. The information about what to do to enable your NMC environment installation for use in SA z/OS is described in "Installing the NMC Workstation" on page 159.

If you pan to use Kanji support for NMC keep in mind that all the NetView workstations in the domain must support the character set you decide to use. Multilingual support is not available.

Running Multiple NetViews

If you use two NetViews and you want to monitor resources using the NMC workstation, bear in mind that the NMC workstation must be linked to NetView Graphic Monitor Facility Host Subsystem (GMFHS) on the Networking NetView which has a connection to RODM. See Figure 11 on page 62. You can operate network and SA z/OS resources via RODM and have SA z/OS running in another NetView to control the automation resources. This, however, requires a subset of SA z/OS, referred to as the SA z/OS satellite, to be installed on the Networking NetView. See "Step 25: Install an SA z/OS Satellite" on page 138 for details.

If you run the Networking Automation NetView only on the focal point, then you cannot have your resources automated by SA z/OS.

If you run the System Automation NetView only on the focal point, you cannot have networking resources in RODM, but only SA z/OS resources that you automate.

Alternatively, you can run both the Networking Automation and the System Automation on the same NetView. This way, you can save storage and CPU costs because of the reduction in the duplication of, for example, tasks and logs. But more important, it reduces maintenance and system programmer costs. See Figure 10 on page 61 for details.

In such an environment all functions are handled by that NetView. You may want to give the individual NetView tasks different priorities, for example, the System Automation tasks need to run above the VTAM's priority, whereas others (Networking Automation) need to run at a lower priority. This is achieved with z/OS Workload Manager Enclaves support.

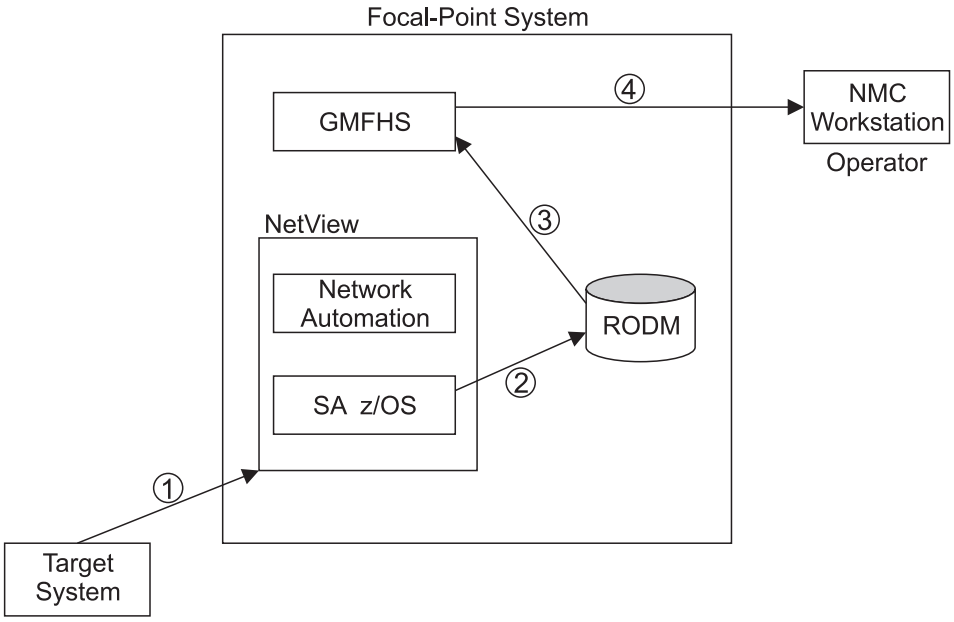

Figure 10. SA z/OS Enterprise with Networking Automation and System Automation running on the same NetView

Figure 11 on page 62 illustrates the flow of data from a target system to the focal point when two NetViews are used on the focal point - one for Networking Automation and one for System Automation.

1. The target system data is sent to the Networking NetView at the focal point via Command Handler or Alerts; the AAO AOFSENDALERT will dictate which forwarding mechanism is used. (Alerts from processor operations are sent directly to the Automation NetView).
2. The satellite z/OS automation (focal point) receives the data that is sent from the targets and updates objects in RODM appropriately.
3. NetView Graphic Monitor Facility Host Subsystem (GMFHS) becomes aware of status updates.
4. GMFHS broadcasts updates to the operator workstation.

When an operator initiates a command or routine from a workstation, the action flows back to the Networking NetView for processing in the reverse direction from that shown in Figure 11 on page 62.

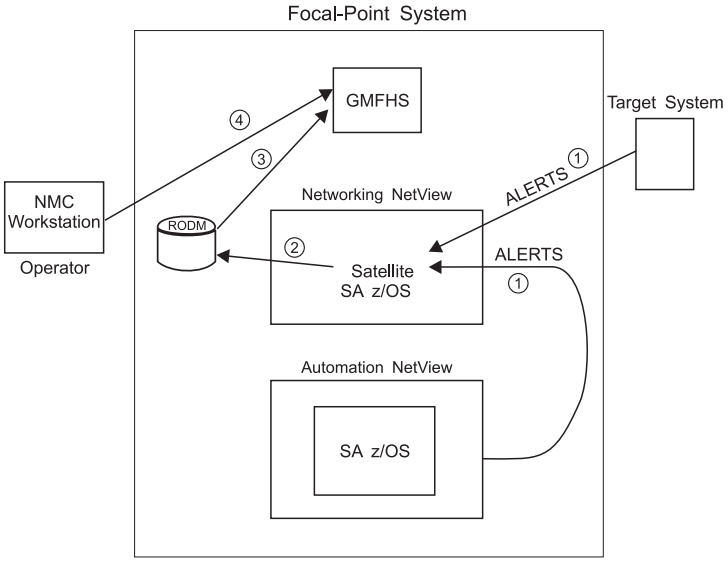

Figure 11. SA z/OS Enterprise Using a Networking NetView and an Automation NetView

Chapter 7. Planning for Automation Connectivity

This chapter provides background on SA z/OS. It includes what a focal point system is and what targets are, and how to define a network of interconnected systems, known as an *automation network*, to SA z/OS for purposes of monitoring and controlling the systems. The procedures and examples in this chapter assume that VTAM definitions for systems in the automation network are in place and available as input.

The Focal Point System and Its Target Systems

SA z/OS allows you to centralize the customization, monitoring, and control functions of the multiple systems or images that make up your enterprise using a single, centrally located z/OS system. This controlling z/OS system is called the focal point system. The systems it controls are called target systems. These systems communicate using LU6.2 sessions, XCF, MQSeries and NetView facilities.

Defining System Operations Connectivity

This section discusses the following aspects of defining system operations connectivity:

- "Multiple NetViews"
- "Overview of Paths and Sessions"

Multiple NetViews

The number of NetViews that run in your SA z/OS complex affects how you plan for it. SA z/OS can operate with just one NetView at its focal point. Prior to NetView 1.4 and SA z/OS 2.2 the networking and automation function could not run on the same NetView. This is no longer the case. It is your decision whether or not you want to run the *Networking Automation* and the *System Automation* on separate NetViews.

Overview of Paths and Sessions

To learn about message forwarding paths, see "Message Forwarding Path" on page 64 and to learn about gateway sessions, see "Gateway Sessions" on page 64.

Message Forwarding Path

SA z/OS generates and uses messages about significant actions that it detects or takes such as a resource status change. In addition to sending these messages to operators on the same system, SA z/OS can forward them from target systems to a focal point system and can route commands and responses between systems, using a message forwarding path. This path is defined in your policy. Key components in a message forwarding path include:

- A primary focal point system
- A backup focal point system
- A target system or systems
- Gateway sessions connecting systems. Gateway sessions use inbound and outbound gateway autotasks. Communication is via the NetView RMTCMD or XCF when the focal point system and target system are in the same sysplex.

Using a message forwarding path, a focal point system can monitor several target systems.

SA z/OS uses notification messages to update the status of resources displayed on the status display facility (SDF). Routing notification messages over the message forwarding path helps consolidate monitoring operations for multiple systems on the SDF at a focal point system. See *IBM Tivoli System Automation for z/OS User's Guide* for details on configuring SDF for a focal point system-target system configuration.

Gateway Sessions

Outbound and Inbound Gateway Autotasks: Each gateway session consists of:

- Two gateway autotasks on each system:
  - One autotask for handling information outbound from a system, called the outbound gateway autotask. This establishes and maintains all connections to other systems. It sends messages, commands, and responses to one or more systems.
  - One autotask for handling information incoming from another system, called the inbound gateway autotask. A system can have one or more inbound gateway autotasks, depending on the number of systems to which it is connected.

Figure 12 on page 65 shows a single gateway between two SA z/OS agents, IPUNA and IPUNB.

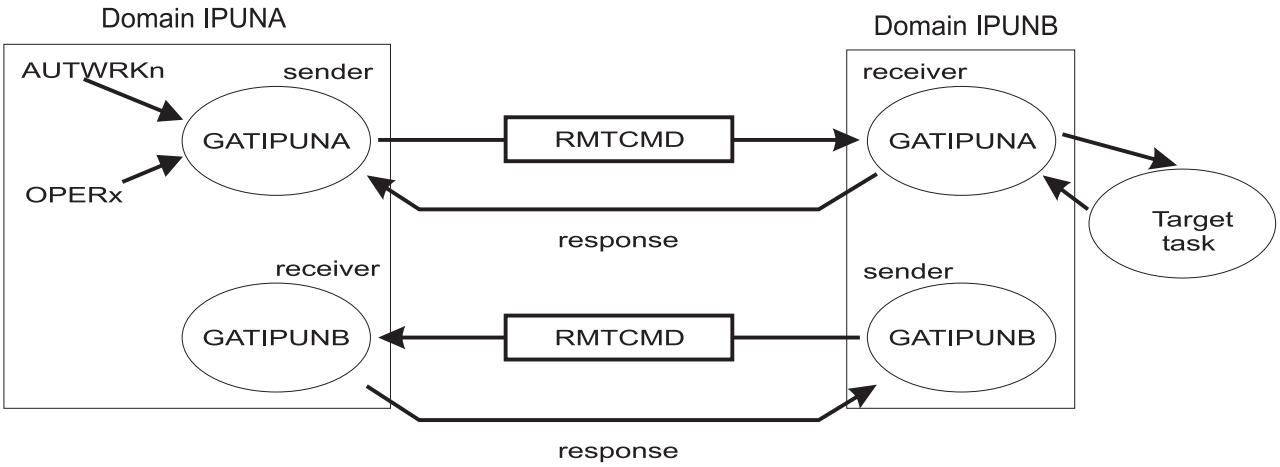

Figure 12. Single Gateway Example

There is one task handling all outbound data. This task is setup at SA z/OS initialization time. Normally the task has a name that begins with GAT and ends with the domain name. So for IPUNA, the gateway task is GATIPUNA.

When VTAM becomes active, the gateway task (GATOPER) issues a CONNECT call to the remote system, IPUNB in our example. If the GATIPUNA task on the remote system is not already active, it will be started automatically by NetView.

All requests initiated by system IPUNA and destined for system IPUNB use the task pair GATIPUNA. Likewise all requests that originate on system IPUNB and are destined for system IPUNA use the pair GATIPUNB. In other words the communication is half-duplex. There is one task pair responsible for the outbound traffic while another task pair is in charge of the inbound traffic. Each pair consists of a sender - running on the local system and receiver that runs on the remote system.

Disallowing the starting of the receiver task protects the local system from getting requests from the remote system.

The task structure is similar when using XCF as the communication vehicle. Using the "GATxxxx" task as the receiving and processing task on the remote side gives a dedicated task pair for the communication between the two systems. This task pair exists twice, once for each outbound communication. It is important to notice that the standard RPCOPER is not used for the processing of the remote procedure call.

In the automation policy for each system in an automation network, you need to define only the outbound gateway autotask (see *IBM Tivoli System Automation for z/OS Defining Automation Policy*). However, in the NetView DSIPARM data set member DSIOPF, you must define all gateway autotasks, both inbound to and outbound from a system, as operators.

You define the outbound gateway autotask by defining the GATOPER policy item for the Auto Operators policy object in the customization dialog. You must specify an operator ID associated with the GATOPER function in the Primary field on the Automation Operator NetView panel. See *IBM Tivoli System Automation for z/OS Defining Automation Policy* for more information.

For this example, the operator ID for the system CHI01 outbound gateway autotask is GATCHI01. Similarly, any operator ID for an inbound gateway autotask is the prefix GAT combined with the inbound gateway domain name.

Figure 13 shows three systems: CHI01, ATL01, and ATL02. System CHI01 is the focal point for forwarding messages from target systems ATL01 and ATL02. In Figure 13, gateways are designated as follows:

O Outbound gateway autotask
I Inbound gateway autotask.

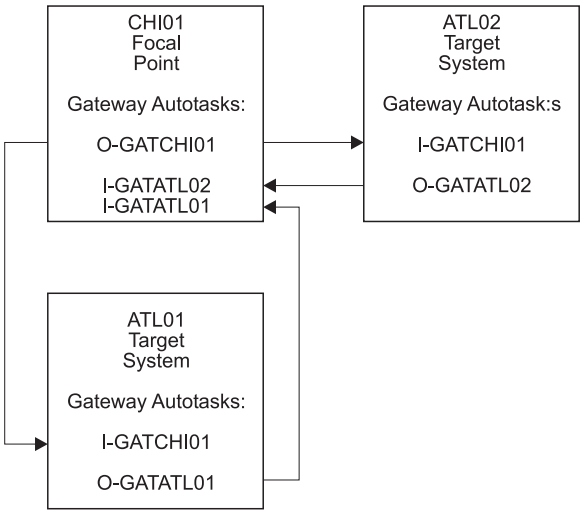

Figure 13. Example Gateways

How Gateway Autotasks Are Started: Gateway autotasks establish a connection between systems when any system receives the following NetView message:

```
DSI112I NCCF READY FOR LOGON AND SYSTEM OPERATOR COMMANDS
```

When this message is received, the following steps occur:

1. The outbound gateway autotask tries to establish an outbound session with the remote system.
2. A gateway session between two systems is established when the outbound gateway autotask has established its outbound session to the remote system.

This process automatically establishes outbound and inbound connections for systems without human operator intervention.

How Gateway Sessions Are Monitored: Optionally, gateway sessions can be monitored by a command executed periodically. The time interval is set in the field Gateway Monitor Time. in the Automation Setup policy item for the System policy object.

See *IBM Tivoli System Automation for z/OS Defining Automation Policy* for details. The ID of the timer created to monitor gateway sessions is AOFGATE. This timer will not be set if NONE is entered for Gateway Monitor Time.

If SA z/OS detects that any gateway session is inactive during the monitoring cycle, it tries to restart the session.

Automatically Initiated Terminal Access Facility (TAF) Full-Screen Sessions

Using the FULL SESSIONS policy item of the Network policy object, you can set up automatically initiated terminal access facility (TAF) full-screen sessions from within SA z/OS. *IBM Tivoli System Automation for z/OS Defining Automation Policy* describes how to define applications with which SA z/OS operators can establish TAF sessions automatically using the SA z/OS NetView interface.

Using Focal Point Services

Once an automation network is configured, you can use the message forwarding path to route messages, commands, and responses between systems. SA z/OS operators can display the status of gateway autotasks and TAF full-screen sessions using the SA z/OS operator commands. Details on these operator activities are in *IBM Tivoli System Automation for z/OS User's Guide*.

Defining Processor Operations Communications Links

After determining that you plan to use the processor operations functions, you must decide the type of communication link from your focal point system to your support element. Processor operations supports the following types of communication connections:

- NVC
- SNMP
- TCP/IP

Meeting Availability Requirements

In order to reduce the interruption time in case of processor operations communication problems, the following facilities are available:

- Backup Support Element
- Alternate focal point system

Backup Support Element

Selected types of the CMOS-S/390 processor family and all zSeries processors have a second Support Element installed, operating in hot-standby mode. If the primary Support Element fails, the backup SE is automatically activated as the new primary Support Element. The SE configuration information is always duplicated, so the new primary SE has the same configuration information as the failing one including the SNA or IP network addresses.

Alternate Focal Point System

An alternate focal point system can be used, in addition to the primary focal point system, to minimize the effect of a focal point system outage. If a focal point system must remain operational all the time, an alternate focal point system can be operated in a take-over mode.

Alternate Focal Point for SNA based NVC connections

If you plan to install an alternate focal point system, you must include one or more 37xx communications controllers. Each controller must be equipped with a channel adapter. The Network Control Program (NCP) must be installed in the communications controllers. You can use a 3174 subsystem control unit in place of the 37xx.

However, the alternate focal point system operator is not automatically notified of the loss of the session between a focal point system and a NetView connection. This notification is instead received by the operator of the failed focal point system, which is the primary focal point system.

Alternate Focal Point for SNMP connections

If you plan to use a second focal point system for your processor operations SNMP connections, make sure that the TCP/IP USS stack is always up and that your IP network allows the communication between the alternate focal point and the Support Elements.

BCP internal interface considerations

If you have customized SA z/OS to use the BCP internal interface for the sysplex hardware automation, each system being a member of the sysplex has its processor hardware connection activated and can issue hardware requests to the SEs of the other sysplex members. The SA z/OS internal code routes the supported hardware commands only to a system in the sysplex with a functioning hardware interface to make sure the request can be processed successfully.

Task Structure for Processor Operations

For processor operations there is a task structure that is modular; distinct types of SA z/OS tasks handle different work assignments. The types of SA z/OS tasks are:

- Target control tasks
- Message monitor tasks (used for SNMP and TCP/IP connections only)
- Recovery task
- Start task
- Polling task
- OCF-CI task

SA z/OS allows up to 999 tasks of each of the first three types, but only one recovery task and one processor operations start task. Because SA z/OS tasks are z/OS tasks that require system services and also add to the load running in the NetView address space, you should only define as many tasks as are needed.

The following guidelines help you match the number of SA z/OS tasks to your SA z/OS configuration.

- The number of message monitoring tasks for target systems connected with a SNMP connection should be identical to the number of target control tasks in your environment.
- The number of target control tasks should be less than or equal to the number of target hardware defined. If you plan to use the processor operations group and subgroup support for the common commands, the total number of target control tasks should be equal to the number of concurrently active target hardware systems.
- In consideration of focal point performance, limit the total number of tasks to a number your system can handle.

Target Control Tasks

The number of target control tasks is automatically calculated and set.

Target control tasks process commands. A target system is assigned to a target control task when the target system is initialized. More than one target system can be assigned to the same target control task. A target control task is a NetView autotask.

Message Monitor Tasks

Note:
When you are using a NetView connection, these tasks are not required.

The number of message monitor tasks is automatically calculated and set.

Message monitor tasks receive SNMP traps from the Support Element's SNMP clients and receive messages from the PSMs and their associated VM second level systems at the focal point system. The traps and messages are broadcast to the appropriate tasks and operators.

Recovery, Start, and Polling Tasks

Automation for resource control messages runs under the recovery task, which is a NetView autotask. Processor operations also uses the recovery task for processing of recovery automation commands. Normally, this task is idle. It is generated automatically when you generate NetView autotask definitions from the configuration dialogs.

The startup task, a NetView task, is used to establish the processor operations environment with the NetView program and to start the other NetView tasks needed for processor operations to function. The startup task is only active during processor operations start (ISQSTART).

The polling task, another NetView task, is used to poll the processors using NetView connections. You determine both the polling frequency and polling retries to be attempted. (These polling functions are specified using the NetView connection path definition panels in the configuration dialogs.) This task is generated automatically when you generate the NetView Autotask definitions from the customization dialogs. This NetView task enables SA z/OS to verify and update operations command facility-based processor status.

Processor Operations OCF-CI Task

The OCF-CI task receives messages sent to the support element on the console integration interface. These messages come from a target OCF-based or parallel enterprise server operating system. The task broadcasts these messages to the appropriate processor operations task and operators interested in processor operations. For information about interested operators, see *IBM Tivoli System Automation for z/OS User's Guide*. The OCF-CI task, a NetView autotask, is singular. Only one is required, and it is required only for processors connected with a NetView connection. This task is not required for SNMP connections.

Planning Processor Operations Connections

This section describes making the hardware connections. It is divided into subsections for each set of hardware connections:

- "Preparing the Processor Operations Focal Point System Connections" on page 70 and "Preparing the Alternate Focal Point System Connections" on page 70 for focal point system connections

- "Preparing the Target System Connections" on page 71 for target system connections. This section also discusses complex connection configurations.

Preparing the Processor Operations Focal Point System Connections

The physical path for the focal point system consists of connections from the HMC, SE, or PSM to the focal point system. SA z/OS processor operations supports the following types of communication connections:

- NVC
- SNMP
- TCP/IP

TCP/IP Firewall-Related Information

The TCP/IP SNMP connections of ProcOps use port number 3161. This is the port number that Support Elements or Hardware Management Consoles use to communicate with SA z/OS ProcOps or other applications using the z900 API.

In case you have firewalls installed between the processor LAN and the LAN that SA z/OS ProcOps belongs to , make sure port 3161 is registered to prevent SE/HMC responses from being rejected.

Preparing the Alternate Focal Point System Connections

An alternate focal point system can be connected to your DP enterprise in addition to the primary focal point system.

The physical connection path for the alternate focal point system is identical to that for the primary focal point system. As with the primary focal point system, SA z/OS processor operations supports the following types of communication connections:

- NVC
- SNMP
- TCP/IP

Connection Example

Figure 14 on page 71 shows an alternate focal point system as well as a primary focal point system connected from an IP or SNA network to the processor hardware LAN.

For SNA networks, an SNA gateway device such as 2216 or 37xx network controller must be connected to the processor LAN. In an SNA network, the NetView connection type NVC can be used. The NVC connection also requires that the processor LAN is a token-ring LAN. Note, that not all processors of the zSeries processor family may support NVC connections.

For an SNMP connection, the processor hardware LAN can be either Ethernet or token ring. With SNMP, a connection can be established either to the Support Element of a CPC, or to an HMC. This HMC must have the CPCs defined you want to manage. This option is not available for SNA based NVC connections.

With TCPIP, a connection can be established to a ProcOps Service Machine on a VM host (PSM).

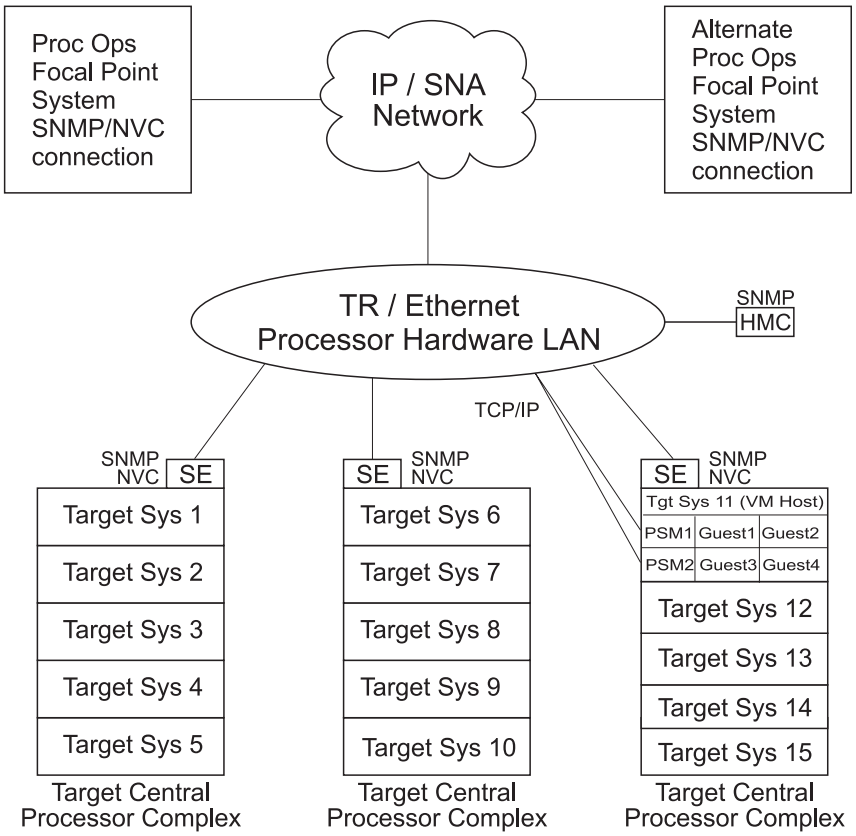

Figure 14. Alternate and Primary Focal Point System Connections from an IP or SNA Network to the Processor Hardware LAN

Preparing the Target System Connections

The supported processor hardware allows you to use the attached Support Element or an HMC (SNMP connections only), connected to the processor hardware LAN for hardware operations management tasks and for operating system control. The Console Integration (CI) function of the SE or HMC is used by processor operations to send commands to an operating system and to receive messages from an operating system. The Operations Command Facility (OCF) of the SE or HMC is used to perform tasks like SYSTEM RESET, LOAD, or ACTIVE.

The usage of CI by processor operations is intended to automate system initialization and recovery tasks. For day-to-day console operation tasks, processor operations CI usage should supplement the operating system command routing facilities of SA z/OS or the available console devices like the 2074 control units.

Defining I/O Operations Communications Links

When you use SA z/OS on one system to make an operational change to an I/O resource, like a shared ESCON Director, it coordinates the change with other copies of SA z/OS on other systems. This is especially important when the result of the action you are taking removes connectivity - disables I/O paths - so that the systems do not lose access to critical resources. Each copy of SA z/OS interacts with its local system image (for example, via VARY) so the operating system has the chance to ″vote″ on the changes. When one system fails VARYs, SA z/OS takes

that as a vote of ″no″ and fails the operation. The copy of SA z/OS from which you initiated the operation then interacts with the other copies on the affected system images to back out VARYs that were successful.

The copies of SA z/OS across your systems also use the network to share information with each other on changes to the I/O configuration and to provide displays that collect I/O information from multiple systems.

To do this, the SA z/OS I/O operations functions on each system image need to intercommunicate. They do this by establishing VTAM sessions between each other. All systems that share access to a given ESCON Director should run SA z/OS to provide the protection described above. Those copies of SA z/OS that do share access to a Director automatically discover each other and establish sessions each time they start.

You can also use the Reset Host function of I/O operations to force two copies of SA z/OS that do not share any ESCON Directors to establish communications. This is useful if you want to benefit from the I/O operations multisystem I/O graphic displays or use its multisystem version of Remove CHP, Restore CHP, Remove Device, or Restore Device, even across system images that don't use ESCON Directors or have no reason to share them.

I/O operations is able to interact with systems that are running ESCON Manager. I/O operations can interact with VM systems that run ESCON Manager 1.2 to support switching operations (for example, blocking ports or writing an entire saved switch configuration) and for Remove CHP and Restore CHP. I/O operations can interact with z/OS systems that run ESCON Manager 1.3 to support the same operations as for VM, and also the same level of multisystem Query and graphic display requests that ESCON Manager 1.3 itself supports.

To plan for this function, you must review the I/O configuration across the systems that you will define as an enterprise in SA z/OS. You should plan to include in one enterprise all system images that share a given ESCON Director, in order to benefit from the I/O operations configuration change protection and displays.

To enable the VTAM sessions, you must create VTAM definitions as described in "Step 18B: Perform VTAM Definitions" on page 131 to support communications between I/O operations defined as a VTAM application in each of them.

Where images do not automatically use those definitions to start sessions, because they do not share ESCON Directors, you should plan local procedures to use the SA z/OS Reset Host function to force I/O operations to start the sessions.

Chapter 8. Naming Conventions

SA z/OS System Names

The information in this section describes name requirements for z/OS systems and for processor operations functions.

All system names defined with the customization dialog within one policy database must be unique.

If your system names currently contradict this restriction, you must change the names before using SA z/OS.

System names defined in the customization dialog for z/OS, VM, TPF, or LINUX systems can have up to 20 characters and must be unique within the SA z/OS enterprise.

When you name elements of your SA z/OS processor operations, use a logical format to create names that are clear to the people using them. The following names can consist of 1 to 8 alphanumeric characters (A-Z,a-z,0-9,#,$,@), cannot contain blanks, and must begin with an alphabetic character:

- Processor or target hardware names
- Target system names
- Focal point name

Processor or target hardware system names, target system names, group names for target systems, and subgroup names for target systems must all be different from one another. Target system names must also be different from processor operations names. For any given system, however, its system name can equal its own processor operations name.

Group and subgroup names for target systems can consist of up to 20 alphameric characters.

Sysplex group names should not be more than 8 characters in length since they are used to address the sysplex or subplex.

Cloning on z/OS Systems

The SA z/OS cloning capability allows you to specify up to 36 clone IDs to identify a system and to identify an application. These clone IDs are then used to qualify the application job name to ensure a unique job name for each system. The names given to each of these clones must be unique. The z/OS system symbolics and the NetView &domain. variable can also be used.

Further Processor Operations Names

Image, Load, and Reset profile names are defined at the support element of an OCF-based target processor. They must consist of the characters A-Z and 0-9. Secondary OCF and Image profile names can be up to eight characters; Reset and Load profile names can be up to sixteen characters.

ESCON Director Ports

This section offers some suggestions for naming ESCON Director ports (dynamic switch ports) and fully utilizing these names in I/O operations display and connectivity commands.

Reasons for Naming Switch Ports

Assigning names to switch ports:

- Provides an indication of what is on that port. For example, CP01.SYSA.CHP38 indicates that this port is physically connected to processor CP01, on system SYSA, on CHPID 38.
- Allows you, when issuing I/O operations connectivity commands, to refer to ports by name. For example, `BLOCK 3490.46233.CU1.E *` blocks the port connected to interface E of control unit side 01, on the 3490 control unit with serial number 46233. See “Using Port Logical Names” on page 75.
- Allows you, when issuing I/O operations connectivity commands, to change connectivity of an entire system to a control unit. For example, `PROHIBIT CP01.SYSA* 3990.35182* *` removes connectivity from all ports on system SYSA of processor CP01, from all ports on the 3990 control unit with serial number 35182. See “Using Generic Logical Names” on page 76.

Suggestions for Naming ESCON Director Ports

When naming ports, you should choose names that help identify what the port is connected to. This simplifies the task of entering commands when connectivity changes are required. Following are some suggestions for naming CHPID ports and control unit ports, followed by a figure displaying those ports in an actual configuration.

Naming CHPID Ports

Name the CHPID ports with three parts: the processor name, followed by the system image name, followed by the CHPID number. For example:

```
CP02.SYSC.CHP40
```

is the port name associated with CHPID 40, on system SYSC of processor CP02.

Naming Control Unit Ports

Name the control unit ports with four parts: the device type, followed by the serial number, followed by the storage cluster (or control unit side), followed by the interface letter. For example:

```
3990.35182.SC1.E
```

is the port name associated with the 3990 with serial number 35182, on storage cluster 1, interface E.

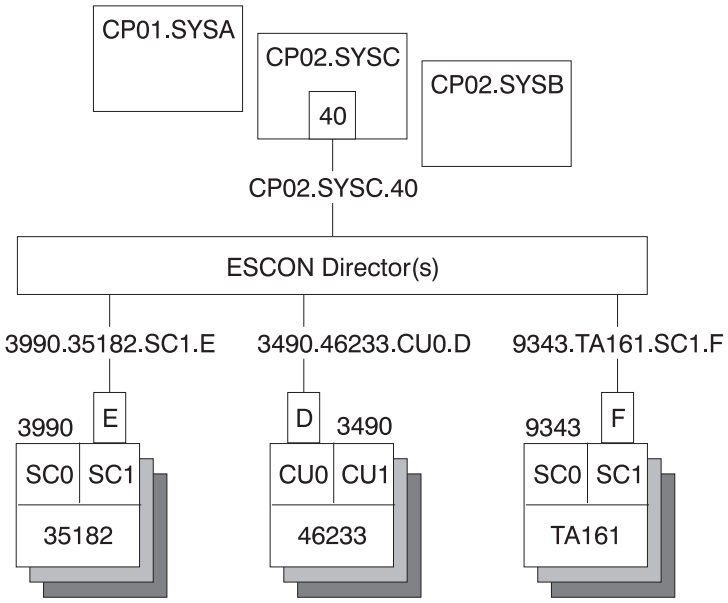

Figure 15. Examples of Port Names in a Configuration

Methods of Naming Ports

You can assign names to ports using the following:

- The WRITE command

  You can use the command:

  ```
  WRITE CP01.SYSB.CHP38 (D3) 100
  ```

  to write the name CP01.SYSB.CHP38 to port D3 on switch 100. This command is available on the operator command line, the ISPF command line, the workstation feature command builder, and the port settings notebook.
- The matrix editor

  You can use the matrix editor to enter a name next to the port number; then send the matrix to the switch. This interface is available on ISPF and the workstation.
- EXECs

  You can create an EXEC with commands like:

  ```
  WRITE CP01.SYSB.CHP38 (D3) 100
  WRITE 3990.35182.SC1.E (F1) 100
  ```

  to send a series of name assignments to a dynamic switch.
- The WRITE switch (WRITESWCH)

  You can create an EXEC to issue the WRITESWCH command, placing the new name in the WRITESWCH data block.

Using Port Logical Names

Once names are assigned to ports, you can issue a single command to change the connectivity of one or more switches. The command:

```
BLOCK 3490.46233.CU1.F 100
```

blocks the port named 3490.46233.CU1.F on switch 100. The command:

```
BLOCK 3490.46233.CU1.F *
```

blocks the port named 3490.46233.CU1.F on any switch that contains that name. The command:

```
PROHIBIT CP02.SYSC.CHP42 3490.46233.CU1.F *
```

looks for any switch that has both names, CP02.SYSC.CHP42 and 3490.46233.CU1.F. If both names exist on any switch, those two ports are prohibited from each other.

The use of these commands is limited to one change per switch.

Using Generic Logical Names

SA z/OS I/O operations provides the ability to use an asterisk as a wild card character in commands that use port names. This allows you to make more than one change on each switch.

You can use an asterisk as a name in the DISPLAY NAME, BLOCK, UNBLOCK, ALLOW, and PROHIBIT connectivity commands. For example, if you issue:

```
PROHIBIT CP02* 3490.46233* *
```

all switches are searched for ports with names beginning with CP02 (for example, CP02.SYSA.CHP34 and CP02.SYSB.CHP70) and ports with names beginning with 3490.46233 (for example, 3490.46233.CU1.B and 3490.46233.CU0.D). If found, those ports are prohibited from each other.

By using a single command, you can remove connectivity from a entire system to a control unit. However, for this to work properly:

- The names must be consistent across all switches.
- You must issue the connectivity commands from an I/O operations system that has access to all switches.

Any names that are not an exact match cause no errors. Any switches that are not affected because they were not accessed cause no errors. You only receive notification if:

- No name match is found on any one switch (warning return code).
- No name match is found on any switch (failure return code).

Command Usage Examples with Generic Logical Names

The following are some examples of how you can issue I/O operations commands using generic logical names:

- Use DISPLAY NAME to show information about the ports specified:

```
DISPLAY NAME CP02.SYSC* *
SWCH                 STATUS  I/O
PORT NAME                 DEVN    LSN   PORT  H B C  P DEF
CP02.SYSC.CHP22           0400    02     C6   O B      CH
CP02.SYSC.CHP39           0100    00     EC          P CHCU
CP02.SYSC.CHP35           0100    00     C5            CH
CP02.SYSC.CHPE0           0200    01     E0            CH
```

- Use DISPLAY NAME to show information about the ports for the 3490 with serial number 46233:

```
DISPLAY NAME 3490.46233* *
SWCH                 STATUS  I/O
PORT NAME                 DEVN    LSN   PORT  H B C  P DEF
```

```
3490.46233.CU0.D          0100    02     C0           CU
3490.46233.CU0.F          0200    01     F6           CU
3490.46233.CU1.A          0300    00     E7         P CU
3490.46233.CU0.C          0400    03     C1           CU
```

- Use BLOCK to remove access to a 3490 with serial number 46233 (four variations):

```
BLOCK  3490.46233.CU0.D  *          (for one port on some switch)
BLOCK  3490.46233.CU0*   *          (for one CU side)
BLOCK  3490.46233*       *          (for one CU)
BLOCK  3490.46233*       100        (for one CU through SW 100)
```

  Notice that the first BLOCK command affects only one switch because there should be only one port with the name 3490.46233.CU0.D.

- Use PROHIBIT and then ALLOW to remove access from one host to one 3490 and give access to another host:

```
PROHIBIT  CP02.SYSC*  3490.46233*  *    (affects multiple paths)
ALLOW     CP01.SYSA*  3490.46233*  *    (affects multiple paths)
```

- Use PROHIBIT to remove access from one host to all 9343s to show results:

```
PROHIBIT  CP02.SYSA*  9343*        *
DISPLAY   NAME        9343*        *
SWCH                STATUS  I/O
PORT NAME                 DEVN    LSN   PORT  H B C  P DEF
9343.TA161.SC0.A          0100    02     E0          P CU
9343.TA161.SC0.B          0200    01     E1          P CU
9343.TA161.SC1.A          0300    00     E2          P CU
9343.TA161.SC0.C          0400    03     E1          P CU
```

In summary, you can use generic logical names to control system connectivity without being concerned about individual ports and switches.

Part 2. Installation

This part provides instructions for:

Chapter 9. Installing SA z/OS on Host Systems

This chapter describes the tasks required to install SA z/OS components on the SA z/OS host systems. This chapter includes information on installing SA z/OS on both focal point and target systems. The target system installation does not require some of the steps used for the focal point installation. Any installation step that does not apply to the target systems is indicated. Many of the installation steps have corresponding planning activities and explanations in chapters 2 through 6 of this book. Chapter 10 describes installation on workstations.

In this chapter, the single installation steps are marked as either being required for all or certain SA z/OS components or as being ***optional***. ***Optional*** denotes steps that may or may not need to be performed based on your environment, your system management procedures, and your use of the SA z/OS product. For each of these steps you need to decide whether it is required for your installation.

Each optional step explains why it is optional and describes the circumstances when you will need to perform it.

Notes:

1. The meaning of the term *target system* as used by SMP/E needs to be distinguished from the way the term is used in SA z/OS. As used in SMP/E and when describing the installation of z/OS products and services, a target system is the system on which a product such as SA z/OS is installed. It is the collection of program libraries that are updated during SMP/E APPLY and RESTORE processing. In this publication this meaning of target system is referred to as an "SMP/E target system". The usual SA z/OS meaning of a "target system" is a computer system attached to a focal point system for purposes of monitoring and control.

2. In this book, data set names are shown with the high level qualifier ING. You can have a different high level qualifier for your data sets.
3. If ESCON Manager is already installed, consider that SA z/OS ***cannot*** run together with ESCON Manager on the same system. Running a mixed environment will end up with unpredictable results for example, storage overlay ABEND0C4 or ABEND0C1. See also "Step 4D: Update LPALST*xx*" on page 92 and "Step 4E: Update LNKLST*xx*" on page 92.

Overview of Installation Tasks

The major tasks required for installing SA z/OS on a focal point are listed in Table 14.

Table 14. Installation Tasks for SA z/OS Host Systems. ✓=Required, *=Optional

Task	SysOps	ProcOps	I/O Ops
"Step 1: SMP/E Installation" on page 84	✓	✓	✓
"Step 2: Allocate System-Unique Data Sets" on page 86	✓	✓	✓
"Step 3: Allocate Data Sets for the Customization Dialog" on page 88	✓	✓	✓
"Step 4: Customize SYS1.PARMLIB Members" on page 89	✓	✓	✓
"Step 5: Setting up MQSeries" on page 94	✓		
"Step 6: Customize SYS1.PROCLIB Members" on page 96	✓	✓	✓
"Step 7: Customize NetView" on page 99	✓	✓	
"Step 8: Preparing the Hardware" on page 106	✓	✓	
"Step 9: Preparing the VM PSM" on page 111	*		
"Step 10: Customizing the Automation Manager" on page 115	✓		
"Step 11: Customizing the Component Trace" on page 116	✓	✓	
"Step 12: Customizing the System Logger" on page 117	*		
"Step 13: Install ISPF Dialog Panels" on page 118	✓	✓	✓
"Step 14: Verify the Number of available REXX Environments" on page 124	✓	✓	
"Step 15: Customization of NetView for TEC Notification by SA z/OS" on page 125	*	*	
"Step 16: Compile SA z/OS REXX Procedures" on page 128	*	*	
"Step 17: Defining Automation Policy" on page 128	✓	✓	
"Step 18: Define Host-to-Host Communications" on page 130	✓	✓	✓
"Step 19: Enabling SA z/OS to Restart Automatic Restart Manager Enabled Subsystems" on page 133	*		
"Step 20: Define Security" on page 133	*		

Table 14. Installation Tasks for SA z/OS Host Systems (continued). ✓=Required, *=Optional

Task	SysOps	ProcOps	I/O Ops
"Step 21: Customize the Status Display Facility (SDF)" on page 134	*		
"Step 22: Check for Required IPL" on page 135	✓	✓	✓
"Step 23: Automate System Operations Startup" on page 135	✓		
"Step 24: Verify Automatic System Operations Startup" on page 137	*		
"Step 25: Install an SA z/OS Satellite" on page 138	*		
"Step 26: Installing and Customizing the NMC Focal Point" on page 139	*		
"Step 27: Copy and Update Sample Exits" on page 147	*	*	*
"Step 28: Install CICS Automation in CICS" on page 148	*		
"Step 29: Install IMS Automation in IMS" on page 150	*		
"Step 30: Install TWS Automation in TWS" on page 152	*		
"Step 31: Install USS Automation" on page 154	*		
"Step 32: Customizing GDPS" on page 156	*		

Step 1: SMP/E Installation

SysOps	ProcOps	I/O Ops
✓	✓	✓

Perform the SMP/E installation as described in the *Program Directory* document shipped with this product. This documentation contains the required information on how to build the SMP/E environment.

Note: In the steps that follow, sample jobs are all members of the SINGSAMP data set, the SA z/OS sample library.

Table 15 shows a list of target data sets as provided by the SMP/E installation process to be used for production on your system.

Table 15. Target Data Sets

Data Set Name	Description
ING.SINGIMSG	ISPF messages 1
ING.SINGINST	SMP/E jobs to install the product alternatively to using SMP/E dialogs 2
ING.SINGIPDB	Policy database samples 1
ING.SINGIPNL	ISPF panels 1
ING.SINGIREX	ISPF REXX execs 1

Table 15. Target Data Sets (continued)

Data Set Name	Description
ING.SINGISKL	ISPF skeletons 1
ING.SINGITBL	ISPF tables 1
ING.SINGJMSG	Kanji NetView messages 5
ING.SINGJPNL	Kanji NetView panels 5
ING.SINGMOD1	Different SA z/OS modules 3
ING.SINGMOD2	Different SA z/OS modules in LINKLST 3
ING.SINGMOD3	Different SA z/OS modules in LPALIB 3
ING.SINGNMSG	NetView messages 3
ING.SINGNPNL	NetView panels 3
ING.SINGNPRF	NetView profiles 3
ING.SINGNPRM	NetView DSIPARM samples 3
ING.SINGNREX	NetView REXX execs 3
ING.SINGSRC	SA z/OS source 3
ING.SINGPWS1	NMC exploitation code 4
ING.SINGJPWS	Japanese NMC exploitation code 5
ING.SINGSAMP	General samples 3
ING.SINGMSGV	For VM second level systems support 6
ING.SINGOBJV	For VM second level systems support 6
ING.SINGREXV	For VM second level systems support 6

Table 16 shows a list of the HFS directories that are provided by the SMP/E installation process.

Table 16. HFS Paths

HFS Path	Description
/usr/lpp/ing/adapter	Shell script 7
/usr/lpp/ing/adapter/lib	Executable 7
/usr/lpp/ing/adapter/config	Configuration file 7
/usr/lpp/ing/adapter/data	Customer data / empty at installation 7
/usr/lpp/ing/adapter/ssl	Customer data / empty at installation 7
/usr/lpp/ing/ussauto	Customer data / empty at installation 7
/usr/lpp/ing/ussauto/lib	USS automation executable

The following list helps you to grant RACF access to the appropriate users of the data sets:

1 Data sets of this category are related to ISPF and need to be accessed by all persons using the customization dialog.

2 Data sets of this category need to be accessed by the system programmer running SMP/E.

3 Data sets of this category need to be used by the NetView and automation team responsible for setting up and customizing system automation and I/O operations.

4 Data sets of this category need to be accessed by anyone who will be installing the NMC component.

5 Data sets of this category are only required if you install Kanji support.

6 Data sets of this category are defined in VM setup.

7 Files in these directories are used for the E2E adapter.

Step 2: Allocate System-Unique Data Sets

SysOps	ProcOps	I/O Ops
✓		✓

Certain data sets are required several times across the focal point and target systems. This section tells you which of them are required on which systems or sysplexes. To allocate these data sets, sample jobs are provided in the following members of the SINGSAMP data set:

- INGALLC1
- INGALLC2
- INGALLC3
- INGALLC4

Each of these jobs needs to be run on *every* system where an instance of the data sets is required.

Prerequisite for running the jobs:
Before you can run these jobs, you need to edit them to make them runnable in your specific environment.

To do so, follow the instructions that are supplied in the comments inside the jobs.

The values that you fill in (such as the system name) may be different for each system where you run the jobs.

Step 2a: Data Sets for I/O Operations

SysOps	ProcOps	I/O Ops
		✓

The data set in Table 17 is required once on each system where you want to have I/O operations available. It cannot be shared between systems. It needs to be referred to in the I/O operations startup procedure in "Step 6: Customize SYS1.PROCLIB Members" on page 96.

Table 17. Data Sets for I/O Operations

Purpose	Sample job to allocate the data set	Name (as assigned by the sample job)	Organization	DD name in the I/O operations startup procedure
HCD trace file	INGALLC1	*<your high-level qualifier>.<your system name>*.HCDTRACE	Sequential	HCDTRACE

Step 2b: Data Sets for Automation Agents

SysOps	ProcOps	I/O Ops
✓		

The data sets in Table 18 are required once per automation agent and cannot be shared between automation agents. They need to be referred to in the startup procedure for each automation agent's NetView in "Step 6: Customize SYS1.PROCLIB Members" on page 96.

Table 18. Data Sets for Each Individual Automation Agent

Purpose	Sample job to allocate the data set	Name (as assigned by the sample job)	Organization	DD name in the NetView startup procedure
Automation status file	INGALLC2	<*your high-level qualifier*>.STATS	VSAM	AOFSTAT
Dump file	INGALLC2	<*your high-level qualifier*>.INGDUMP	Sequential	INGDUMP
IPL data collection	INGALLC4	<*your high-level qualifier*>.IPLDATA	VSAM	HSAIPL

Step 2c: Data Sets for Automation Managers (Primary Automation Manager and Backups)

SysOps	ProcOps	I/O Ops
✓		

The data sets in Table 19 are required once per sysplex or standalone system. Within the same sysplex or standalone system, they should be shared by the primary automation manager and its backups, but they cannot be shared across sysplex or standalone-system boundaries. Except for the takeover file, they need to be referred to in the automation manager startup procedure in "Step 6: Customize SYS1.PROCLIB Members" on page 96.

Table 19. Data Sets for All Automation Managers in a Sysplex or Stand-Alone System

Purpose	Sample job to allocate the data set	Name (as assigned by the sample job)	Organization	DD name in the automation manager startup procedure
Schedule override file	INGALLC3	<*your high-level qualifier*>.HSAAMOVR	VSAM	HSAOVR
Configuration information data set	INGALLC3	<*your high-level qualifier*>.SHSACFGO	Sequential	HSACFGIN
PARMLIB	INGALLC3	<*your high-level qualifier*>.PARMLIB	Partitioned	HSAPLIB
Takeover file	INGALLC3	<*your high-level qualifier*>.TAKEOVER	VSAM	—
Note: Use the following formula to work out the required size of the takeover file: 4000 records + *n* records of 4K, where *n* is the maximum numbers of resources.				

Step 2: Allocate System-Unique Data Sets

The data sets in Table 20 must be allocated once for each automation manager. They cannot be shared between an automation manager and its backups on the same system. Therefore, when you edit the sample job that is to allocate the data sets for a particular sysplex or standalone system, make sure that you include a fresh job step for each automation manager that you plan to have on that particular sysplex or standalone system. For more details, see the comments in the INGALLC3 sample.

Note: You can safely use the same DD names in each job step because DD names are not shared across job step boundaries.

These files also need to be referred to in the automation manager startup procedure in "Step 6: Customize SYS1.PROCLIB Members" on page 96.

Table 20. Data Sets for Each Individual Automation Manager

Purpose	Sample job to allocate the data set	Name (as assigned by the sample job)	Organization	DD name in the automation manager startup procedure
Internal trace files (optional)	INGALLC3	<*your high-level qualifier*>.<*second-level qualifier for the automation manager instance*>.TRACET0	Sequential	TRACET0
	INGALLC3	<*your high-level qualifier*>.<*second-level qualifier for the automation manager instance*>.TRACET1	Sequential	TRACET1
ALLOCOUT data set	INGALLC3	<*your high-level qualifier*>.<*second-level qualifier for the automation manager instance*>.SYSOUT	Sequential	SYSOUT
DUMP data set for LE environment	(Need not be allocated as a data set; the DD name in the automation manager is a dummy)	n/a	Sequential	CEEDUMP

Step 3: Allocate Data Sets for the Customization Dialog

SysOps	ProcOps	I/O Ops
✔	✔	✔

When this step is performed, the sample job INGEDLGA in SINGSAMP can be used to allocate data sets required for the I/O operations and the customization dialog. These data sets are normally allocated only on the focal point system, where you use the customization dialog. These data sets include:

- ***for system operations***
  - The ISPF table library data set that contains the values you enter in the customization dialog
  - The system operations control file: this is the output data set for the customization dialog when building the system operations control files (automation control file and automation manager configuration file)

The following data sets are created:

Data Set Name	Purpose
ING.CUSTOM.AOFTABL	ISPF customization table for customization dialog
ING.CUSTOM.SOCNTL	System operations control file

- *for processor operations*
  - The ISPF table library data set that contains the values you enter in the customization dialog
  - The processor operations control file, generated using the customization dialog, which provides information about your processor operations configuration
  - The processor operations control file log, which receives messages that result from generating the processor operations control file

  The following data sets are created:

Data Set Name	Purpose
ING.CUSTOM.AOFTABL	ISPF customization table for customization dialog
ING.CUSTOM.POCNTL	Processor operations control file
ING.CUSTOM.POLOG	Processor operations control file log

- *for I/O operations*
  - The I/O operations configuration file. Since you use the customization dialog to collect information and build control files, you normally need them only at the focal point. The I/O operations dialogs, however, are used to input commands and get responses from the I/O operations part of SA z/OS. Since they do not support multisystem commands for I/O operations functions, you must install them on each system, focal point or target, where you wish to use them.

  The following data sets are created:

Data Set Name	Purpose
ING.CUSTOM.IHVCONF	I/O operations configuration file

Notes:

1. Keep these data set names in mind. They are used in "Step 13: Install ISPF Dialog Panels" on page 118. If you rename the data sets, you need to adapt the corresponding names in that step.
2. You might also allocate a dedicated data set for the output for building the system operations control files (automation control file and automation manager configuration file). The default for this data set is the policy database itself. It is however recommended to use a separate data set.

Step 4: Customize SYS1.PARMLIB Members

SysOps	ProcOps	I/O Ops
✓	✓	✓

The *xx* suffix on each SYS1.PARMLIB data set member can be any two characters chosen to match your IEASYS naming scheme. The SA z/OS samples delivered in SINGSAMP use a suffix of *SO*. See *z/OS MVS Initialization and Tuning Reference* for information about IEASYS.

The subsequent sections will enumerate the SYS1.PARMLIB data set members that need to be changed and provide information on how to achieve this.

Step 4A: Update PROG*xx*

SysOps	ProcOps	I/O Ops
✔	✔	✔

With DFSMS/MVS®, you can define authorized libraries in a PROG*xx* member for dynamic authorized program facility (APF). You can activate a PROG*xx* list using the SET PROG=*xx* command without IPLing the system. Alternatively, you can define authorized libraries to the APF in an IEAAPF*xx* member. For a complete description of dynamic APF and PROG*xx*, see *z/OS MVS Initialization and Tuning Reference*.

Update PROG*xx* to include:

- ING.SINGMOD1, ING.SINGMOD2, ING.SINGMOD3
- SYS1.SCBDHENU (for I/O operations)

  Note: Do not include SYS1.NUCLEUS.
- If you chose to set AOF_SET_AVM_RESTART_EXIT to 0 in module AOFEXDEF then you will need to add the following entry into your PROG*xx* member:

```
EXIT ADD
     EXITNAME(IXC_ELEM_RESTART)
     MODNAME(AOFPERRE)
```

Step 4B: Update SCHED*xx*

SysOps	ProcOps	I/O Ops
✔	✔	

Compare the content of the SCHED*xx* member with the INGSCHE0 member which resides in the SINGSAMP sample library. Edit the SCHED*xx* member so that it includes all the statements in the INGSCHE0 member.

This enables the NetView subsystem interface address space, the NetView application address space (for the automation agent) and the automation manager to run without being swapped out of memory.

Step 4C: Update MPFLST*xx*

SysOps	ProcOps	I/O Ops
✔	✔	

It is recommended that you update the MPFLST*xx* member *after* having installed the ISPF Customization Dialog (see “Step 17: Defining Automation Policy” on page 128

128). Using the customization dialog you can define your Automation Policy and create a list of messages involved in automation. The customization dialog also allows you to define header and trailer lines for the message list, thus building a complete MPFLST*xx* member called MPFLSTSA.

Alternatively, update the contents of the MPFLST*xx* member with the INGEMPF member that resides in the SINGSAMP sample library. Edit the MPFLST*xx* member so that it includes all the statements in the INGEMPF member. Review the MPFLST*xx* member to ensure that it is appropriate for your system, and resolve any conflicts.

This adds the SA z/OS message automation and console display suppression specifications to the MPFLST*xx* member.

The *AUTO(YES)* in the NO_ENTRY statement is required to gather all unknown WTORs. If you ensure that the unknown WTORs are routed to automation via the general MPF exit IEAVMXIT and you have all messages that are specified in the NetView message automation table also specified in the MPF with *AUTO(YES)*, you can specify *AUTO(NO)* for the NO_ENTRY statement.

If you want to use CICS Automation, add the following entries in MPFLST*xx* in SYS1.PARMLIB to trap all DFH , EVE, and EYU prefix messages:

```
DFH*,SUP(NO),AUTO(YES)
EVE*,SUP(NO),AUTO(YES)
EYU*,SUP(NO),AUTO(YES)
```

This CICS Automation requirement forwards these messages to NetView.

Add the following entry in MPFLST*xx* in SYS1.PARMLIB to trap all DFS™ and EVI prefix messages:

```
DFS*,SUP(NO),AUTO(YES)
DSP*,SUP(NO),AUTO(YES)
EVI*,SUP(NO),AUTO(YES)
IOS071*,SUP(NO),AUTO(YES)
DXR*,SUP(NO),AUTO(YES)
AVM0*,SUP(NO),AUTO(YES)
IEF450*,SUP(NO),AUTO(YES)
```

This IMS Automation requirement forwards these messages to NetView.

Add the following message entry in MPFLST*xx* in SYS1.PARMLIB to trap all Tivoli TWS and Tivoli Workload Scheduler for z/OS messages:

```
EQQ*,SUP(NO),AUTO(YES)
EVJ*,SUP(NO),AUTO(YES)
```

This TWS/TWS Automation requirement forwards these messages to NetView.

See *z/OS MVS Initialization and Tuning Reference* for more information about MPF.

Messages processed by the automation either via the NetView Automation Table (AT) or by the NetView commands TRAP and WAIT must not be suppressed by any MPF (message processing facility) list being used.

The following messages must be available for the Parallel Sysplex automation:

```
IEA230E IEA231A IEA232A IEA404A IEA405E IEA406I IEA794I
IEE037D IEE041I IEE043I IEE205I IEE400I IEE503I IEE533E IEE600I IEE712I IEE769E IEE889I
ILR009E
```

```
INGY1097I
IRA200E IRA201E IRA202I IRA204E
IXC102A IXC247D IXC250I IXC251I IXC255I IXC309I IXC402D IXC500I IXC501A IXC517I IXC559I
IXC560A
IXG257I IXG261E
IXL126I IXL127A
```

Step 4D: Update LPALST*xx*

SysOps	ProcOps	I/O Ops
✓	✓	✓

Edit the LPALST*xx* member to add ING.SINGMOD3 to the SA z/OS load library. There is no other choice for this library, it must be in the LPALST concatenation.

You can avoid an IPL:
As ING.SINGMOD3 contains only a few modules, you can also code a PROG*xx* member that enables a dynamic addition of those modules to the LPALST. Hereafter, no IPL is required.

Notes:

1. Make sure that the SA z/OS load library is cataloged in the master catalog or copy the members in ING.SINGMOD3 into a data set which is in the master catalog.
2. Be sure you do not have any data sets containing load modules with prefixes of **IHV, AOF, ISQ, ING, HSA** in these members.

Step 4E: Update LNKLST*xx*

SysOps	ProcOps	I/O Ops
✓	✓	✓

To run SA z/OS, you must ensure that program libraries can be found at start up time.

Add *SINGMOD2* to the LNKLST concatenation. There is no other choice for this library: it **must** be in the LNKLST concatenation.

For the other libraries, either add them to the LNKLST concatenation or add them on STEPLIB DDs in the JCL in SYS1.PROCLIB used to start the products.

Adding libraries on STEPLIB DDs will involve performance degradation compared to adding them to the LNKLST concatenation and should therefore be avoided.

z/OS link list data sets no longer have to be cataloged in the master catalog. It is possible to specify a volume in the link list entry for data sets which are cataloged in user catalogs.

Note: Be sure that you do not have any data sets containing load modules with prefixes of *IHV*, *AOF*, *ISQ*, *ING*, *HSA*, *EVE*, *EVI*, *EVJ* in these members.

Step 4F: Update IEFSSN*xx*

SysOps	ProcOps	I/O Ops
✔	✔	

Ensure that IEFSSN*xx* contains all the statements in the INGESSN sample member. If this has already been accomplished during the NetView installation there are no further updates required to this member.

Compare the contents of the IEFSSN*xx* member with the INGESSN member, which resides in the SA z/OS sample library. Edit the IEFSSN*xx* member so that it includes the subsystem records from the INGESSN member.

This defines:

- Four-character prefix used in the NetView startup procedure member names. The four-character prefix that you specify must match the four-character prefix of the NetView startup procedure member names. For example, if you specify INGE, then the names of the NetView startup procedure members must be INGE*xxxx*, where *xxxx* are any four characters you choose. If you change this four-character prefix, you can dynamically add this entry using the z/OS command SETSSI. Otherwise you must perform an IPL of z/OS to effect the change.
- JES startup specifying JES2 or JES3 with the NOSTART option. This prevents JES from starting before SA z/OS during the IPL process. If you plan to start JES before NetView, remove the NOSTART option from the following statement:

  ```
  JESx,,,PRIMARY,NOSTART
  ```

  You can also use the IEFSSN-syntax:

  ```
  JESx,PRIMARY(YES),START(NO)
  ```

  The positional syntax (PRIMARY,NOSTART) is still supported. For the correct syntax of your environment please check the *z/OS MVS Initialization and Tuning Reference*.

The first active NetView SSI is used for program-to-program interface communication. When a NetView SSI is active and in use by the program-to-program interface (PPI), and another NetView SSI becomes active that is coded higher in the SSN table, then the PPI will switch and use that NetView SSI. If product automation has already signed on to the PPI before the switch occurs, product automation program-to-program communications will be disrupted.

To ensure that disruptions do not occur, do one of the following:

- Make sure that the SA z/OS SSI entry is the first SSI in the SSN table and the SSI starts during the IPL.
- Use an option available with NetView to specify “NOPPI” on all NetView SSIs except the SSI that product automation uses. This “NOPPI” option is specified as a startup parameter on the SSI JCL.
- If you do not code the SSI that product automation uses in the highest position in the SSN table and you do not use the “NOPPI” option, then the SSI that is first in the SSN table must be up before product automation initialization and must remain uninterrupted until final termination of product automation.

Check the subsystem name table in MVS SYS1.PARMLIB, member IEFSSN*xx* to verify the NetView SSI used by product automation is first in the list (ahead of all other NetView subsystem names).

Step 4G: Update JES3IN*xx*

SysOps	ProcOps	I/O Ops
✓		

If you are using JES3, compare the contents of the JES3IN*xx* member with the INGEJES3 member which resides in the SINGSAMP sample library. You may want to review these members first to see whether there are entries in the INGEJES3 member that are already in the JES3IN*xx* member. After merging the INGEJES3 member, be sure there are no duplicate entries in the JES3IN*xx* member.

This includes the DUMP options and adds the JES3 parameters.

Step 5: Setting up MQSeries

SysOps	ProcOps	I/O Ops
✓		

When you want to use MQSeries for communication between the automation manager and the automation agents and provide a continuous high-reliable environment for the automation manager, you must set up an MQSeries manager. The basic steps on how to do this are described in *MQSeries for OS/390 System Management Guide*. The outline for setting up MQSeries for exploitation by SA z/OS is described in the subsequent substeps.

Note: This step is not necessary when you have decided to use XCF for communication between the automation manager and the automation agents.

Step 5A: Customizing a MQSeries Manager for SA z/OS

This needs to be done on every system where either the automation manager and/or an automation agent is installed.

Please refer to *MQSeries for OS/390 System Management Guide* for the correct MQSeries installation and setup processing. It is recommended that there is a single MQSeries manager instance for SA z/OS. The way SA z/OS exploits the MQSeries infrastructure does not immediately require a dedicated DB2 for MQSeries's shared data repository.

The following list describes which parameters and MQSeries options need special consideration for SA z/OS.

- SA z/OS is using the TSO/Batch adapter
- SA z/OS does not require any distributed queuing capabilities
- Archiving can be switched off. See Macro CSQ6LOGP.

- The maximum number of connections SA z/OS is using is in the range of 20 which is the current default. However if the number of SA z/OS query threads is increased drastically you may also require additional connections. See Option IDBACK in Macro CSQ6SYSP.
- The maximum number of messages processed per MQSeries transaction is normally set to 10000 via CSQINP1. See MQSeries DISPLAY MAXSMSGS. This should be sufficient in all cases. However when it turns out that the number of messages in the State Queue (see INGAMS commands) reaches the area of 4000, this value should be set to approximately. 2.5 * the number of expected state queue messages. See MQSeries DEFINE MAXSMSGS.
- For the calculation of the number of log records see the *MQSeries for OS/390 System Management Guide*. You may consider that the largest processing load which is to be logged is the takeover case, where about 5000 MQPUTs and 5000 MQGETs with an average of 4 K messages are produced in a timeframe of one minute. As a rule of thumb, you can take the MAXSMSGS value, divide it by two to get the number of maximal MQGETs. The same number can be taken for the maximum number of MQPUTS. The largest transaction producing so many GETs and PUTs should be in a range of a minute and processes 4 K messages.

ARM Considerations for MQSeries Manager

If you choose z/OS Automatic Restart Manager for doing the restart, the MQSeries manager instance must be set up to allow element restarts only. A cross system restart is not required.

Step 5B: Definition of CF Structures for a Sysplex Environment

In a full sysplex environment, you need to build CF list structures needed for MQSeries shared queues. One CF list structure can have more than one MQSeries queue, however a queue cannot span CF structure boundaries. It is recommended that you use two CF structures for the SA z/OS queues. The Workitem Queue and the Agent Queue can easily share a CF structure. The CF storage size consumption for the Automation State Queue could be very dynamic, because the automation manager can generate a huge amount of uncommitted MQSeries messages also using CF storage.

Please refer to the *MQSeries for OS/390 System Management Guide* for information on how to calculate the size of the CF List Structures. The number of messages per queue and the message size can be taken from the provided samples (INGALLMS, INGALLML). Keep in mind that you have to double the number of messages for the state queue because of uncommitted updates which also occupy CF storage.

Step 5C: Definition of MQSeries Queues

Two sample jobs are delivered defining the queues either as

- local Queues for a single system environment with Sample INGALLML
- shared Queues for a full Sysplex Environment with Sample INGALLMS

Important operands to consider:

name of the queue

the names of the queues are fixed and follow the pattern:

- 'HSA' the SA z/OS automation manager component prefix
- the XCF groupID (8 Characters) to allow more than one Automation domain per Sysplex

This is the only modifiable part. Please see the samples.

- a predefined character string as suffix:
  - WORKITEM.QUEUE for the Workitem Queue
  - STATE.QUEUE for the Automation State Queue
  - AGENT.QUEUE for the Automation Agent Queue

CFSTRUCT
Name of the CF List structure used by this queue. This is only valid for shared queues.

MAXMSGL
maximum length in bytes per message (excluding messages descriptor). This length plus the message descriptor should not be larger than 4K. This value is already provided in the samples and should not be changed

MAXDEPTH
maximum possible number of messages. The samples provides values which should fit your environment. INGAMS can be used to monitor whether there is a danger that a queue becomes full. In this situation the size should be changed accordingly.

Display MQSeries Statistics

Operators may be interested in some MQSeries queue statistics. The INGAMS command with the automation manager detail option provides the data.

It is also possible to use the ISPF based MQSeries standard operations and control panel to operate with the SA z/OS queues.

Step 5D: RACF Considerations for MQSeries

If you are using RACF to protect MQSeries resources on your system the following RACF profiles must be defined:

```
CLASS(MQCONN) profile mqsubsysid.BATCH
CLASS(MQCONN) profile qsgname.BATCH
CLASS(MQQUEUE) profile mqsubsysid.HSA.**
```

Notes:

1. `mqsubsysid` is the 4 character subsystem name of the local MQSeries queue manager.
2. `qsgname` is the name of the queue-sharing group to which the queue manager belongs (refer to the QSGDATA statement in the MQSeries documentation for details on `qsgname`.
3. The SA z/OS automation manager and automation agents must be granted READ access to the resource profiles of MQCONN.
4. The SA z/OS automation manager and automation agents must be granted ALTER access to the resource profiles of MQQUEUE.

Step 6: Customize SYS1.PROCLIB Members

SysOps	ProcOps	I/O Ops
✔	✔	✔

Some changes need to be made to startup procedure members in the SYS1.PROCLIB data set. It is recommended that you either back up the startup procedure members that you are going to change or that you create new members.

Step 6A: NetView Startup Procedures

SysOps	ProcOps	I/O Ops
✓	✓	

- **NetView Subsystem Interface Startup Procedure**

  NetView provides a sample subsystem interface startup procedure in member CNMSJ010. Copy this member from your NetView library and adapt it to your needs. Rename it to agree with the four-character prefix defined in the IEFSSN*xx* member which is described in "Step 4F: Update IEFSSN*xx*" on page 93.

- **NetView Application Startup Procedure**

  You can use the sample provided in the INGENVSA member of the SINGSAMP data set. Copy it to a member of each system's SYS1.PROCLIB data set (the one of the focal point system as well as the ones of the target systems).

  Customize each copy to your needs. In particular, do the following:

  1. Make sure that the AOFSTAT, INGDUMP and HSAIPL concatenations include the data sets that you allocated in "Step 2: Allocate System-Unique Data Sets" on page 86.
  2. Rename the NetView application startup procedure member to agree with the four-character prefix defined in the IEFSSN*xx* member, which is described in "Step 4F: Update IEFSSN*xx*" on page 93. For example, if the name of the NetView application startup procedure is INGE*xx*, then INGE must be specified in the IEFSSN*xx* member as the character prefix.

  If you do not make ING01 your domain name, make a note of what your NetView domain name is. This information is needed in "Step 6C: I/O Operations Startup Procedure" on page 98 and for system operations. See also *IBM Tivoli System Automation for z/OS Defining Automation Policy* for more information on enterprise definitions.

  See *Tivoli NetView for z/OS Installation: Configuring Additional Components* for further details on how to modify the NetView startup procedure.

Step 6B: Startup Procedures Required for System Operations Only

SysOps	ProcOps	I/O Ops
✓		

- **Automation Manager Startup Procedure**

  You can use the sample provided in the INGEAMSA member of the SINGSAMP data set. Copy it to a member of the SYS1.PROCLIB data set of the focal point system.

  Customize that copy to your needs. In particular, make sure that the DD concatenations mentioned in "Step 2: Allocate System-Unique Data Sets" on page 86 include the data sets that you allocated there. In addition, consider customizing the following points:

  – If you prefer not to place the automation manager PARMLIB member in the SYS1.PARMLIB concatenation, include a HSAPLIB DD statement in the automation manager startup procedure (see also "Step 10: Customizing the Automation Manager" on page 115):

    ```
    HSAPLIB DD DSN=IBMING.PARMLIB, DISP=SHR
    ```

In place of IBMING.PARMLIB, use the PARMLIB data set that you allocated in "Step 2: Allocate System-Unique Data Sets" on page 86.

– A separate NON-APF authorized task library is required in addition to the authorized STEPLIB.
  - The NON-APF authorized task library is used by the LE task. It must concatenate the NON-APF authorized SA z/OS product library with the LE runtime library and the C/C++ library.
  - The STEPLIB concatenation specifies the APF-authorized SA z/OS product library.

- **Other System Operations Startup Procedures**

  Copy the following members from the SINGSAMP data set to members of the SYS1.PROCLIB of the focal point system:

  – INGPIXCU
  – INGPHOM
  – INGPIPLC
  – HSAPIPLC

  Follow the customization instructions that are contained within these members.

  These procedures make use of certain data sets and must have the appropriate authorizations. For details refer to "Granting NetView and the STC-User Access to Data Sets" on page 177.

- *Optional:* **Startup Procedure for the External Writer of the Component Trace**

  Copy member HSACTWR from SINGSAMP. At least the SYSNAME parameter must be specified before the procedure is stored in a library of the PROCLIB concatenation.

Step 6C: I/O Operations Startup Procedure

SysOps	ProcOps	I/O Ops
		✓

You can use the sample provided in the INGEIO member of the SINGSAMP data set. Copy it to a member of each system's SYS1.PROCLIB data set (the one of the focal point system as well as the ones of the target systems).

Customize those copies to your needs. In particular, do the following:

- Specify the NetView domain name that you made a note of in step "Step 6A: NetView Startup Procedures" on page 97.
- Make sure that the HCDTRACE concatenation in the procedure includes the data set that you allocated for I/O operations in "Step 2: Allocate System-Unique Data Sets" on page 86.

Due to the fact that z/OS 1.4 HCD has changed the default of the profile option IODF_DATA_SPACE from NO to YES, it is no longer necessary to define the HCD profile data set for I/O operations. However, if you need to specify options for HCD tracing, refer to "Defining an HCD profile" in the *z/OS HCD User's Guide* for how to create that data set.

Step 7: Customize NetView

SysOps	ProcOps	I/O Ops
✓	✓	

This section discusses how to customize several aspects of NetView:

- "Step 7A: Customize NetView Alert Information"
- "Step 7B: Customize NetView DSIPARM Data Set" on page 100
- "Step 7C: Modifying NetView DSIPARM Definitions for an Automation Network" on page 104
- "Step 7D: Customize NetView for Processor Operations" on page 104

Step 7A: Customize NetView Alert Information

SysOps	ProcOps	I/O Ops
✓		

SA z/OS enterprise monitoring depends upon alert information being passed from remote systems to the focal point. Note that this is only necessary when communication is via NPDA alerts.

The NetView command **SRFILTER** (or **SRF**) establishes the conditions governing the recording of data in the hardware monitor database, the generation of messages to the authorized operator, the forwarding of alert data to a NetView focal point, and the coloring of alerts.

In order to ensure that the alerts required by SA z/OS for enterprise monitoring are not filtered out, the following is recommended:

- On any focal point system:
  - issue the command **SRF AREC PASS N ***
- From the remote systems:
  - Issue the command **SRF AREC PASS N ***
  - Issue the command **SRF ROUTE CLEAR**.

These **SRF** commands should be included into a startup CLIST/exit because they need to be issued after every NetView startup.

If you do not want to allow all alerts to pass by using the

```
SRF AREC PASS N *
```

command, you should allow the following event types (*etype*s) to pass, as a minimum:

- NTFY

The NetView SRFILTER command is documented in *Tivoli NetView for z/OS Command Reference Vol. 1*.

Step 7B: Customize NetView DSIPARM Data Set

SysOps	ProcOps	I/O Ops
✓	✓	

Copy any DSIPARM and SINGNPRM member you need to customize into a data set allocated in DSIPARM above the SMP/E maintained NetView DSIPARM and SA z/OS target libraries and edit it there.

Then change the following members in the copied NetView DSIPARM data set:

CNMSTYLE/CxxSTGEN

The various SA z/OS components or environments are activated with TOWER.SA statements.

The following SA z/OS subtowers exist:

SysOps
This enables application or more general resource automation.

ProcOps
This enables Processor Operations.

Satellite
This indicates that the SA z/OS topology manager runs on the Networking NetView for communication with RODM and the NMC.

GDPS This enables GDPS to run under SA z/OS. The following GDPS subtowers exist:

PPRC to run GDPS/PPRC

HYPERSWAP
to run the GDPS/PPRC Hyperswap manager

Furthermore, code one of the following indicating whether or not this is the production versus K-system:

- PROD for a production system
- KSYS for a K-system

This information is used by SA z/OS to pick up the appropriate definition members that vary for the GDPS controlling system (K-system) and the production system. For example, the K-system constitutes a subplex of its own and must therefore use a different XCF group name.

Note: The specification of the GDPS subtower requires you to have one of the following installed:

- GDPS-PPRC 3.1 with GDPS APAR AG31C73
- GDPS-PPRC 3.2

See sample INGSTGEN for further details on the SA tower statements.

To enable SA z/OS, make sure that the following TOWER statements are activated in CNMSTYLE:

```
TOWER =  SA
TOWER.SA  = SYSOPS
```

If you plan to use the Kanji support make sure that you update the member CNMSTYLE:

- `transTbl =DSIKANJI` must be specified in CNMSTYLE
- `transMember =CNMTRMSG` must be uncommented in CNMSTYLE.

For more details, refer to the chapter *"Installing the National Language Support Feature"* in *Tivoli NetView for z/OS, Installation: Configuring Additional Components*.

DSIDMNK

If you are in a multisystem environment and plan to use communications to other NetViews, there must be a resource routing definition statement (RRD statement) defined for each NetView system to which your system is connected. Additionally, the alert forwarding definition to your NMC should be defined.

There are two communication methods for status forwarding:

- NV-UNIQ
- XCF/RMTCMD

Note: For NetView 5.1 and above, DSIDMNK entries have been moved to CNMSTYLE.

AOFMSGSY

Copy and edit the AOFMSGSY member which resides in ING.SINGNPRM and do the following:

1. If you have renamed any automation tasks in `AOFOPF`, you will need to make the corresponding changes here.
2. If you do not wish to use the `ASSIGN BY JOBNAME` exploitation (that is, Advanced Automation CGLOBAL `AOF_ASSIGN_JOBNAME` has been set to 0), do NOT specify (*) in the %AOFOPGSSOPER% synonym, because this may cause serialization problems.
3. If you want to define actions for messages that the SA z/OS NetView Automation Table does not trigger any action for, you may use the symbol %AOFALWAYSACTION%.

   This synonym contains the action statement that is used for all messages within a Begin-End block that SA z/OS does not trigger any action for. The default, NULL, is that no action will be taken and the message does not continue to search for further matches within the same AT.

   See *IBM Tivoli System Automation for z/OS Customizing and Programming* for a description of these synonyms.

INGMSG01

The AT member INGMSG01 provides message suppression that is necessary to prevent mismatches and duplicate automation before the first %INCLUDE. You may use the Customization Dialog to build ATs (System ATs: ACFMxxxx; Sysplex ATs: ACFXxxx; or Enterprise AT: ACFEZ999) that are included in INGMSG01 under the name INGMSG02. The customization dialog provides the means to customize these ATs. The ATs should not be modified because modifications may be lost with a configuration refresh. If you need to build ATs in a way that is not supported by the customization dialog, you may use fragment INGMSGU1 for user entries. INGMSGU1 is

included before INGMSG02. You may use fragment INGMSGU2 for user entries. INGMSGU2 is included behind INGMSG02.

If you want to have additional entries that are only valid to your environment, you can use either a separate AT (specified in the customization dialog) or use one of the user includes. The following shows the AT structure:

```
INGMSG01
    ├── %INCLUDE AOFMSGSY
    ├── %INCLUDE INGMSGU1
    ├── %INCLUDE INGMSG02
    └── %INCLUDE INGMSGU2
```

INGXINIT

The communication DST initialization processing will read data that is specified in the DSIPARM member INGXINIT. Copy and edit the INGXINIT member, which resides in ING.SINGNPRM. Uncomment the following parameters and specify your values:

GRPID
2-byte XCF group ID. Default is blank.

MQM 4-byte MQ manager name. Use this parameter only if you run MQSeries® for communication. If you use XCF, you do not need to specify MQM.

DIAGDUPMSG
This is the number of message buffer IDs that are validated before send and after receive. This is for diagnostic purposes. A value for *nnnnn* may be chosen between 0 (no validation) and 99999. The default is 0 and performance decreases with larger values.

LOGSTREAM
This defines whether or not the NetView agent should establish a connection to the system logger at initialization time. The default is YES. If NO is specified, the following logstreams are not available:

- HSA.WORKITEM.LOG
- HSA.MESSAGE.LOG

PPI This needs to be set to YES to establish a connection to the end-to-end automation adapter.

PPIBQL
The number of elements in the PPI queue—this indicates how large the response to a request may be. It should be greater than the number of queue elements that you expect to be returned. The default is 3000.

All input requests flow into the PPI queue, so the buffer queue limit, PPIBQL, should match this. If this limit is exceeded (that is, the queue limit is too small), then:

- The automation adapter might not be able to send any further requests to the SA z/OS agent, and the agent issues a JNI exception with return code 1735:

  ```
  INGX9820E JNI function ingjppi failed with return code 1735.
  ```

- The SA z/OS agent might not be able to send any responses to the automation adapter, and an AOF350E message is issued.

If you receive these error messages, increase the buffer queue limit.

Requests are lost, but the end-to-end automation operator will receive exception reports. For more details see *System Automation for z/OS End-to-end automation adapter*.

All parameter values must match with the respective parameters in the PARMLIB member HSAPRM*xx* of the automation manager.

A ***GRPID*** may be specified to indicate that a subset of the members of an actual z/OS sysplex is defined in a sysplex group. If specified, the ID may contain 1 or 2 characters. Valid characters are A-Z, 0-9, and the national characters ($, # and @).

It will be prefixed with the string INGXSG to construct the XCF group name used for cross system synchronization, for example, `INGXSGxy`.

If no ***GRPID*** is specified, the default group name INGXSG will be used.

Note:
Syntax errors are reported by a message with error code ERRCODE=564. Any syntax errors will stop the initialization process and therefore no automation will be possible.

The following parsing syntax applies:

- Data can only be specified via key-value-pairs.
- One or more parameters may be specified on one line.
- Each record will be parsed for the keyword.
- Parsing will be stopped and any further input data will be ignored after all keywords listed above are found.
- If the same parameter is specified multiple times, the last one is used.
- For any keyword that was not specified, the default value is blank.
- No blanks between parameters and values are allowed.
- The syntax of a keyword is equal to the syntax of the parmlib member HSAPRM*xx*.

Example of a valid syntax:

```
GRPID=XY,MQM=SSSS,LOGSTREAM=YES
```

Example of an invalid syntax:

```
GRPID = 34 , MQM = SSSS
```

DSICMSYS / AOFCMDSO

If you want to use the SA z/OS SETTIMER command instead of the NetView SETTIMER command, comment out the SETTIMER synonym definition (CMDSYN SETTIMER) in DSICMSYS and uncomment (activate) it in member AOFCMDSO of the DSIPARM data set.If running NetView 5.2, all modifications to commands can be made in the CNMCMDU member. Refer to NetView documentation for details.

Step 7C: Modifying NetView DSIPARM Definitions for an Automation Network

SysOps	ProcOps	I/O Ops
✓	✓	

Notes:

1. The following information refers to setting up a single NetView automation network.
2. For NetView 5.1 and above DSIDMNK entries have been moved to CNMSTYLE.

To support an automation network, you need to add or modify NetView definitions in the following NetView DSIPARM data set members:

- AOFOPFGW
- DSIDMNK

AOFOPFGW Modifications

In the AOFOPFGW member for each system, define the operator IDs used for both outbound and inbound gateway autotasks.

For example, in Figure 13 on page 66, the gateway autotask definitions in AOFOPFGW on system CHI01 are:

```
GATCHI01  OPERATOR
          PROFILEN AOFPRFAO
GATATL01  OPERATOR
          PROFILEN AOFPRFAO
GATATL02  OPERATOR
          PROFILEN AOFPRFAO
```

Step 7D: Customize NetView for Processor Operations

SysOps	ProcOps	I/O Ops
	✓	

To enable SA z/OS, make sure that the following TOWER statements are activated in CNMSTYLE:

```
TOWER =  SA
TOWER.SA  = SYSOPS PROCOPS
```

For SNMP and BCP internal interface connections, it is mandatory to make the security definitions described in “Controlling Access to the Processor Hardware Functions” on page 183.

Processor operations uses automation table entries for its operation. Make sure, the following automation table fragments are included in its master members:

ISQMSG01

Processor operations requires the automation table ISQMSG01 for its operation. This table is automatically activated when processor operations is started and deactived, once it is stopped. This automation table uses symbols defined in AOFMSGSY. Make sure this automation table contains

valid definitions for the variables %AOFOPMSU% and %AOFOPNETOPER%, and that it is accessible at processor operations start time.

ISQMSGU1
This empty member is supplied by processor operations and is included in the ISQMSG01 automation table. By inserting your own automation entries or include statements of your own automation tables here, you can expand processor operations with your own automation routines which may utilize the processor operations supplied command API.

DSIDMNK
If you have defined target hardware in your processor operations configurations with an SNA based NetView connection (NVC), it is recommended to set the VTAMCP statement in your processor operations focal point NetView DSIDMNK member to `VTAMCP=NO`. This is the default when no VTAMCP statement is defined. Depending on your NetView MS environment, messages and alerts from the CPC support elements cannot be processed when the VTAMCP parameter is set to YES.

Note: For NetView 5.1 and above DSIDMNK entries have been moved to CNMSTYLE.

Other NetView definitions supplied by processor operations:

ISQPROF
This member contains the processor operations autotask operator profile definitions. It is available in the operator profile data set SINGNPRF supplied by SA z/OS (see Table 15 on page 84). You may customize the profile definitions in order to use OPCLASS levels different from the supplied ones. This step is optional.

Step 7E: Customize the NetView Message Translation Table

SysOps	ProcOps	I/O Ops
*		

If you use Kanji support the NetView Message Translation Table that was specified in the CNMSTYLE with the `transMember` entry needs to be customized. (The NetView default for the Message Translation Table is CNMTRMSG located in library SDSIMSG1.)

Verify that in the CNMTRMSG member the INCLUDE for CNMMSJPN is uncommented:

```
%INCLUDE CNMMSJPN
```

In addition add includes for the SA z/OS Kanji message members at the beginning of CNMTRMSG:

```
%INCLUDE AOFJ
%INCLUDE EVEJ
%INCLUDE EVIJ
%INCLUDE EVJJ
%INCLUDE INGJ
%INCLUDE ISQJ
```

Note that only the fixed text of the messages has been translated. Any variables inserted into the text cannot be translated using NetView services, even if the variable contains text strings that are in principle translatable.

Step 8: Preparing the Hardware

SysOps	ProcOps	I/O Ops
✓	✓	

The steps described in this section are necessary to prepare your Hardware Management Console (HMC) and Support Elements according to the processor hardware interface you are using. For details about planning the hardware interface, refer to "Planning the Hardware Interfaces" on page 37.

In addition, refer to the publications *Hardware Management Console Guide* and *Support Element Operations Guide* for details about your HMC and SE.

Step 8A: Preparing the Hardware Management Console

Enable the HMC API and Set the Community Name

In order to control a CPC using an HMC instead of the CPC's Support Element, the Hardware Management Console API function must be enabled. If you do not plan to use the HMC to control your CPCs over the TCP/IP SNMP ProcOps interface, omit this paragraph.

1. For this task, you need to be logged on in Access Administrator mode on your HMC.
2. Select **Console Actions** and click on the *Hardware Management Console Settings* icon. On the *Settings* notebook, note the TCP/IP address of the HMC for later.
3. Select the **API** tab. If not already set, enable the API by checking the enable check box.
4. In the **Community name** field, enter a community name you have chosen. Note this community name for later.
5. Finally, select the **Apply** push button to save the changes. The message window shown informs you that the changes made require a restart of the HMC console application in order to become active.

BCP internal interface

To prepare the master HMC, carry out the following steps:

1. Log on to the HMC in your LAN that is to be used for change management operations with a user ID having SYSPROG authority. The HMC must have the CPC objects of your sysplex in the defined CPCs group.
2. Select **Console Actions** icon in the *Views* window and double click on the *Enable Hardware Management Console Services* icon.
3. Select the LIC change **Enabled** radio button. Select the **OK** push button to save the change, or select the **Cancel** push button if LIC change radio button was already set to Enabled.

Usually, there is one HMC in a CPC LAN environment that has LIC change permanently enabled. It will automatically be used by the BCP internal interface. Make sure that this HMC has all CPC objects of your sysplex in the Defined CPCs group.

SNMP

If you want to control your CPCs with the TCP/IP SNMP interface of ProcOps over an HMC, make sure its API is enabled as described in "Enable the HMC API and Set the Community Name" on page 106. Then, continue as follows:

1. Log on to the HMC in *Access Administrator* mode.
2. From the *Console Actions Work Area*, select **SNMP Configuration**.
3. Select the **Communities** tab of the SNMP Configuration notebook window.
4. For the **API** community name, enter the following information and select the **Add** push button to add the new community name:

Protocol	Select UDP from the drop-down list.
Name	The API Community name you have chosen.
Address	The TCP/IP address of the Support Element which you previously made a note of.
Network Mask	255.255.255.255
Access Type	Select the **Read only** radio button.

   If the HMC has multiple network adapters, the SNMP API must be defined to use adapter 0 (primary network adapter) even if that adapter is not later being used for network connection.
5. For the **processor operations SNMP interface** community name, enter the information below and select the **Add** push button to add the new community name.

   The CPC is controlled over the TCP/IP SNMP transport if it is configured for connection protocol SNMP, using the Processor (CPC) entry in the SA z/OS Customization Dialog.

Protocol	Select UDP from the drop-down list.
Name	PROCOPS (use the community name specified in the processor entry for the CPC in your SA z/OS policy database)
Address	Use the IP address of your MVS processor operations focal point system
Network Mask	Use 255.255.255.255 to make sure that only the addressed focal point can control the CPC. You may change the netmask to allow multiple focal point systems to control your CPC. Specify 0.0.0.0 as the address and network mask if you want to allow access from any location in your network to your CPC, using the community name from above.
Access Type	Select the **Read/write** radio button.
6. Select the **OK** push button to save the changed settings and close the SNMP notebook window.
7. If any of the above data was added or changed, you need to shutdown and restart the Console before the changes will be put into effect.

NVC

The following setup step is required if you want to define an SNA-based NetView connection between the Support Element of a CPC and the processor operations focal point. The CPCs that you want to connect to the processor operations focal point must have a valid SNA address configured and must be in the Defined CPCs

Group of the HMC. If the CPC object is not defined to the HMC Defined CPC Group, see the HMC Object Definition task. To complete this setup:

1. Log on to the HMC with a user ID having *SYSPROG* authority.
2. From the selectable *Task List*, choose the **CPC Remote Customization** task.
3. From the *Groups View Work Area*, select the **Defined CPC Group**.
4. Mark the CPC objects you wish to select for processor operations focal point communication and click on the **Problem Management** task icon in the *CPC Remote Customization task area*.
5. In the *Problem Management* window that is displayed, select the **Enable alert generation** push button.
6. In the **Focal Point Addressing, LAN address** field, enter the 12-digit LAN address of the device serving as the gateway between the processor hardware LAN and your SNA network. This device, usually a network control unit such as a 37*xx* or 2216, must be physically connected to the processor hardware LAN.
7. Select the **Save** push button to complete the task for Problem Determination.
8. Now select **Operations Management** task and repeat these steps for the CPC objects that are still marked.

HMC Object Definition

Depending on the processor hardware interfaces, the CPCs that are to be managed must be known by the HMC, used to route OCF requests to other SEs (BCP internal interface), or to the HMC serving as the single point of control (SNMP), or to the HMC that routes alerts from the CPCs to the processor operations focal point (NVC).

Use the following steps to define a CPC object to an HMC:

1. Log on to the HMC with a user ID having *ACSADMIN* authority.
2. From the task list choose the **Object Definition** task. From the *Groups View* select the **Undefined CPC** group.
3. If the CPC object that you want to define to the HMC is shown in the *Undefined CPC's Work Area*, highlight it and then double click on the **Add Object Definition** task in the *Object Definition* tasks window
4. The *CPC Definition Information Notebox* is displayed, showing the available address information for this CPC object. If you do not want to change any of the address information fields or radio button settings, select the **Save** push button. For more information about the address fields or radio buttons, refer to the HMC online help
5. The CPC is now defined to the HMC. The CPC's Support Element is rebooted to activate its registration to this HMC.
6. If the CPC object that you want to define to the HMC is *not* shown in the *Undefined CPC's Work Area*, highlight the **CPC Manual Definition Template** object .
7. The *Manual Add Object Definition* window is displayed. According to your environment, choose which protocol to use for communication between the CPC's Support Element and this HMC.
8. Depending on your protocol selection, enter: An IP address; Or the SNA Network ID and CPC name; Or the token ring address of the LAN bridge in the case of an SNA connection between the HMC and the CPC over a bridged LAN.

9. Select the **OK** push button. The HMC starts to communicate with the CPC using your network information. If the Add was successful, the CPC object will be shown in the *Defined CPCs Work Area*.

Step 8B: Preparing the Support Elements

Before the BCP internal interface can be used, you need to verify for the CPC Support Elements in your sysplex that the required prerequisite MCL levels are active, and that any essential services have been enabled with the necessary settings. This requires the following:

- "Configure SNMP"
- "Enable the API and Set the Community Name" on page 110
- "Set the Cross Partition Flags" on page 110 (LPAR mode)
- "Customize the Authorization Token" on page 111

Configure SNMP

Community names have to be specified in order to use the BCP internal interface transport, the TCP/IP SNMP transport for ProcOps, or both. For this task, you need to be logged on in *Access Administrator* mode on your CPC's Support Element. To complete this task:

1. Start the SNMP Configuration task by double clicking the **Console Actions** icon in the *Views* area of the Console.
2. Select the **Communities** tab of the SNMP Configuration notebook window.
3. For the **API** community name, enter the following information and select the **Add** push button to add the new community name:

Protocol	Select UDP from the drop-down list.
Name	The API Community name you have chosen.
Address	The TCP/IP address of the Support Element which you previously made a note of.
Network Mask	255.255.255.255
Access Type	Select the **Read only** radio button.

   If the SE has multiple network adapters, the SNMP API must be defined to use adapter 0 (primary network adapter) even if that adapter is not later being used for network connection.
4. If the CPC is not controlled over the BCP internal interface transport, omit this step.

   The CPC is controlled over the BCP internal interface if it is configured for connection protocol INTERNAL, using the Processor (CPC) entry of the SA z/OS Customization Dialog.

   For the **BCP Internal Interface** community name, enter the following information and select the **Add** push button to add the new community name:

Protocol	Select UDP from the drop-down list.
Name	SAFOS (Use the CPC authtkn name that you defined for the CPC using the customization dialogs)
Address	127.0.0.1
Network Mask	255.255.255.255
Access Type	Select the **Read/write** radio button.

5. If the CPC is not controlled over the ProcOps TCP/IP SNMP transport, omit this step.

   The CPC is controlled over the TCP/IP SNMP transport if it is configured for connection protocol SNMP, using the Processor (CPC) entry of the SA z/OS Customization Dialog.

   For the **ProcOps SNMP interface** community name, enter the following information and select the **Add** push button to add the new community name:

Protocol	Select UDP from the drop-down list.
Name	PROCOPS (use the community name specified in the processor entry for the CPC in your SA z/OS policy database)
Address	*x.x.x.x* (use the IP address of your MVS ProcOps focal point system)
Network Mask	*x.x.x.x* (use **255.255.255.255** to make sure that only the addressed focal point can control the CPC. You may change the netmask to allow multiple focal point systems to control your CPC. Specify **0.0.0.0** as both the address and network mask if you want to allow access from any location in your network to your CPC, using the community name from above.)
Access Type	Select the **Read/write** radio button.

6. Select the **OK** push button to save the changed settings and close the SNMP notebook window.
7. If any of the above data was added or changed, you need to shutdown and restart the Console before the changes will be put into effect. However, before doing so, continue with the configuration steps for Console below.
8. If SNMP configuration data was added or changed, you need to reboot the Support Element to activate these changes.

For additional SNMP and API configuration information, refer to chapter "Configuring the Data Exchange APIs" in *zSeries 900 Application Programming Interface*.

Enable the API and Set the Community Name

In order to use the BCP internal interface or the SNMP interface, the Support Element API function needs to be enabled. To complete this task:

1. Start the Support Element Settings task by double clicking the **Console Actions** icon in the *Views* area of the Console.
2. Select the **API** tab of the Support Element Settings notebook window. If not already active, enable the API by checking the **Enable the Support Element Console Application Program Interface** checkbox.
3. In the **Community name** field, enter the community name you chose when you configured for SNMP.
4. Select the **Apply** push button to save the changes.
5. Finally, for the changes you have made to the Support Element to become active, you must reboot the Support Element.

Set the Cross Partition Flags

This task is only required if you use the BCP internal interface to connect processor hardware running in LPAR mode. For this task, you need to be logged on in *System Programmer mode* on your CPC's Support Element. To complete this task:

1. Click on the **CPC Group** and highlight the *CPC* icon.
2. Select the **CPC Operation Customization** task.
3. Click on the **Change LPAR Security** icon. The window displayed shows the security settings from the active IOCDS for the logical partitions defined on this CPC.
4. For each logical partition that should use the BCP internal interface to control another partition on this CPC, check the **Cross Partition Authority** checkbox.

Customize the Authorization Token

This task is only required for NVC connections. To complete this task:

1. Log on to the Support Element with a user ID having *ACSADMIN* authority.
2. Select the **Console Actions View**. The *Console Action Work Area* is displayed.
3. Double click on the **Customize Authorization Token** icon. If you want to change the supplied default, enter a new authorization token value. The new value can be up to 8 characters long and must not contain blanks. This authorization token value must be used when defining a NVC for a CPC using the SA z/OS customization dialogs.

Additional Verification for SEs of G3/G4 CPC Hardware

When customizing the Support Element for a G3/G4 machine, it should be verified that the SETUP.CMD file in the Support Element subdirectory C:\MPTN\BIN contains the statement `'ifconfig lo 127.0.0.1'`. Only if this statement is defined, can the BCP internal interface be used to target this machine.

If, after having made the neccessary HMC and SE SNMP definition steps for a G3/G4 CPC, the BCP internal interface communication to this hardware still fails with a condition of 0B100224, please contact your IBM customer engineer to perform the above-mentioned verification. Should the communication still fail, contact IBM software service.

Step 8C: Updating Firewall Information

This step is only needed if you use ProcOps and intend to use TCP/IP based communication to your target processors.

Connection protocol SNMP

This communication protocol internally uses port number 3161. If there are firewalls installed between the LAN that the ProcOps FP belongs to and the processor LAN that the SEs or HMCs belong to, you should:

- Inform your network administrator to make sure that communication requests that come from SEs/HMCs with this port number are accepted.

Step 9: Preparing the VM PSM

SysOps	ProcOps	I/O Ops
	*	

This step is only needed if you use ProcOps to control VM second level systems. The PSM is the communication partner for ProcOps to do this.

Installing the PSM Code on VM

The following parts are shipped as part of the Second Level Guest Support feature:

- In *xxx*. SINGOBJV — module ISQVMAIN (this is the PSM control program's main thread)
- In *xxx*.SINGREXV the following squished REXX programs:
  - ISQRGIUC
  - ISQRCSRV
  - ISQRMSRV
  - ISQRLOGR
  - ISQRCNSV
  - ISQRMHDL
- In *xxx*.SINGMSGV — Message definitions ISQUME

To install the VM parts perform the following steps:

1. Copy the object module ISQVMAIN to the VM file system for the PSM machine as file `ISQVMAIN TEXT`
2. Copy REXX programs to the VM file system for the PSM machine as files:
   - `ISQRGIUC REXX`
   - `ISQRCSRV EXEC`
   - `ISQRMSRV EXEC`
   - `ISQRLOGR EXEC`
   - `ISQRCNSV EXEC`
   - `ISQRMHDL EXEC`
3. Copy message definition ISQUME to the VM file system for the PSM machine as file `ISQUME REPOS`
4. Enter the following commands on the PSM machine (These may be created as an CMS EXEC if necessary). The name chosen for the operand of the GENMOD command (ISQPSM in this case) defines the name of the PSM control program. Any name may be chosen. These commands create the load module for the PSM main thread and the messages definitions for all threads.

   ```
   GENMSG ISQUME REPOS A ISQ
   SET LANG (ADD ISQ USER
   GLOBAL TXTLIB DMSAMT VMMTLIB VMLIB
   LOAD ISQVMAIN
   INCLUDE ISQUME
   INCLUDE VMSTART (LIBE RESET VMSTART
   GENMOD ISQPSM
   ```

5. Create the two files ISQADDRS DATA and ISQPARM DATA as described in "Customizing the PSM" on page 113.

If these steps are processed successfully then the PSM can be started.

Configuration

1. Provide TCPIP connection between the VM host system and the SA z/OS systems that are running NetView ProcOps.
2. Define a ProcOps Service Machine in each VM host. This is a regular virtual machine that IPLs a CMS when it starts. Ensure that it has a minimum of 32 MB of storage defined.
3. Use the IUCV directory control statement to authorize the PSM virtual machine to connect to the CP message service (*MSG). For more information about the IUCV statement, see the *z/VM: Planning and Administration* book.
4. Authorize the ProcOps Service Machine to use CP and CMS commands. The following commands are used by the PSM:

```
SET SECUSER vmachine *
SET EMSG
TERMINAL MORE
SET VMCONIO
SET CPCONIO
GLOBALV
XAUTOLOG
FORCE
XMITMSG
SEND
SMSG
QUERY NAMES
QUERY vmachine
```

5. Optionally, ensure that the language is set automatically and that the ProcOps Service Machine starts when the PSM virtual machine starts by creating a PROFILE EXEC for the virtual machine (if one does not already exist) and adding the appropriate commands to it:

   ```
   SET LANG (ADD ISQ USR
   ISQPSM
   ```

   where ISQPSM is the name of the control program in the earlier example.
6. Ensure that the ProcOps Service Machine has appropriate dispatching priority. Ideally it should have a higher dispatching priority than the guest machines that it manages.
7. Define the PSM as a Service Virtual Machine.
8. For each guest machine, ensure that the PSM virtual machine is defined as its secondary user
9. Define SYSCONS as a NIP console and MCS console for each guest MVS machine, with appropriate routing codes
10. It is recommended that the PSM virtual machine has read access to the minidisk that holds the TCPIP program, so that the NETSTAT command can be issued as part of problem determination procedures.

Customizing the PSM

The PSM uses two files to set parameters for its operation. These files are read at the time that PSM is initialized, and are not read subsequently.

The statements within them determine the various operational characteristics.

Each file is a simple sequential file that must be part of the file system available to the PSM virtual machine. Normally they are files on the A-disk. Each file must be available at PSM initialization. If any is missing, the PSM terminates.

ISQADDRS DATA

The ISQADDRS DATA file specifies those IP addresses that may enter requests to the PSM. Each ProcOps NetView that issues requests to the PSM must have its IP address specified.

Each record of the file specifies a single IP address. Any record that has an asterisk in the first position is treated as a comment. Any record that has the string "/*" in the first two positions is treated as a comment.

The IP address may be specified either in the normal dotted decimal form, or as a node name that is known to TCPIP on the PSM's node. If a node name is specified and that node name has several addresses, then all addresses returned are used.

An example of a valid file is as follows:

```
*  Normal focal point NetView
9.152.80.253
/*  the backup
  9.152.80.254
* another system identified by its node name
  nv.boekey3.de.ibm.com
* a shorter, if infrequent form of IP address
44.55
```

The addresses are *not* checked for validity when they are read.

ISQPARM DATA

The ISQPARM DATA file specifies operational options for the PSM.

Each record of the file specifies a single parameter. Any record that has an asterisk in the first position is treated as a comment. Any record that has the string "/*" in the first two positions is treated as a comment.

The statements are of the form:

```
keyword = value
```

All keywords, except TCPIPNAME, must be specified. If any required keywords are omitted the PSM will terminate. The keywords may be entered in upper, lower or mixed case. Values must be entered as required. If a keyword specification is entered more than once, the latest specification is used.

Valid keywords are:

MESSAGE_SERVER_PORT
The port number that will be used by the Message Server. (That is, the port on which it issues a TCPIP LISTEN request.) This is a number in the range 1-65335. Consult with your network programmer to ensure that this is a port number that is not used by any other processes.

COMMAND_SERVER_PORT
The port number that will be used by the Command Server.

SECURITY
The authorization token used to authenticate both the Message Server and Command Server. This must match the authorization token that is specified in the System Automation Customization dialogs for this PSM Target Hardware. This must have the correct (upper) case.

TCPIPNAME
The name of the TCPIP virtual machine that will provide the connections to ProcOps NetView. When the PSM control program starts, it checks that this virtual machine is running before issuing any TCPIP requests. The default value used, if TCPIPNAME is not specified, is TCPIP.

MAX_MESSAGES
The maximum number of messages that may be stored at any instant in the Message Queue. When the number of messages in the queue exceeds this number, the Message Handler thread terminates with an error message.

TRACE_TYPE
The trace type identifies the trace type value that is entered into log records written by the Logger thread.

An example of a valid file is:

```
Message_server_port = 5556
Command_server_port = 4444
*
TRACE_TYPe = 555
security = ISQHELLO
max_messages = 20
```

Logger Files

The PSM must also have sufficient writeable space on its A-disk to accommodate the logger files and any files that might be used by CP commands such as DUMP, if used.

Step 10: Customizing the Automation Manager

SysOps	ProcOps	I/O Ops
✓		

Step 10A: Customizing HSAPRM*xx*

The HSAPRM*xx* PARMLIB member contains information required for the initialization of the automation manager and default values for other operational parameters. The member is designed to be used in common by all automation manager instances within the automation subplex.

Alternatively you can put the automation manager PARMLIB member in any partitioned data set. Then, you need to insert a statement HSAPLIB DD into the automation manager startup procedure member which refers to this partitioned data set.

A sample member called HSAPRM00 is provided in the SINGSAMP sample library. This sample is automatically copied into the PARMLIB of the automation manager (DD name HSAPLIB) when you allocate this data set as described in "Step 2: Allocate System-Unique Data Sets" on page 86. Refer to Appendix F, "Syntax for HSAPRM00," on page 221 for the contents of this sample and the description of the parameters.

Step 10B: ARM Instrumentation of the Automation Manager

The automation manager can be enabled for Automatic Restart Manager (ARM).

A job skeleton is provided in the SINGSAMP sample library as member HSADEFA to define the SA z/OS specific Automatic Restart Manager policy.

You can define a policy allowing you to keep the number of automation manager instances on a certain level.

In a single system environment

with more than one automation manager active, ARM can automatically restart a failing primary instance. One of the survived automation managers will take the primary role and the restarted instance will become a backup instance.

If there is only one automation manager active on a single system, ARM will automatically restart this instance again. It becomes the primary instance again and runs the takeover. The takeover time is extended by the time needed for the address space restart.

In a sysplex (subplex) environment
ARM will always restart the failing instance on the **same** system. Either there is already a backup waiting around or the restarted instance will take over.

SA z/OS will provide a policy sample with the following major options:

- Restart only for an address space ABEND (Option ELEMTERM). The restart in case of a system breakage is not supported.

  The concept of the automation manager availability follows a 'floating' master model. It is a peer model with one or more backup instances on different systems already active and waiting to take over. Whenever a complete system goes away the failed automation managers (backup or primary) are not restarted somewhere else.
- The ARM element name is a 16 byte string concatenation `HSAAM_sysnamexy` with:

  HSAAM_
  is a string constant as prefix

  sysname
  is the XCF member name of the automation manager which is the 8 byte MVS system name padded with '$', for example: MVS1$$$$

  x is a one byte digit (one of 1, 2, ... 9) automatically determined at initialization time

  y is a blank
- The restart command is the unchanged original start command, however the start mode is always HOT.
- There are no restart dependencies (no Waitpred processing)

Step 10C: Security Considerations

The job invoking the automation manager (see INGEAMSA in the sample library) must have the following access rights:

1. If you are not a superuser you must have access to the OMVS segment.
2. It must be defined by RACF as a superuser for UNIX System Services if the automation manager will be started before JES2 initialization has completed.
3. Read access for the SYS1.PARMLIB data set
4. Write access to the log streams
5. Write access to the following data sets:
   - Trace data sets
   - Schedule override file
   - Configuration information file (DDname HSACFGIN)
   - Takeover file

Step 11: Customizing the Component Trace

SysOps	ProcOps	I/O Ops
✓		

The system operations component as well as the automation manager use the z/OS component trace for debugging purposes. The following setup must be done:

- Copy the CTIHSAZZ member from the SINGSAMP sample library into SYS1.PARMLIB. Do not change this member.
- Copy the HSACTWR member residing in the SINGSAMP sample library into SYS1.PROCLIB.
- Allocate the trace data set used by the component trace. You can use the sample job HSAJCTWR in SINGSAMP to allocate the data set. Modify the sample job where appropriate.

Note: Make sure that the job invoking the ITTTRCWR module (see HSACTWR member in the sample library) has write access to the trace output data set.

Step 12: Customizing the System Logger

SysOps	ProcOps	I/O Ops
*		

Notes:

1. If you set the LOGSTREAM parameter in the HSAPRM*xx* parmlib member to NO then no access will be established to the system logger at initialization. This step is then unnecessary.
2. Though this step is optional, it is, however, recommended. The automation manager writes history information to the z/OS system logger and the automation agents read from it.

   If you do not perform this step, users will not get any output from the INGHIST commands.

To exploit the system logger, the following must be fulfilled:

- systems in a sysplex must run in XCF mode and

  ```
  PLEXCFG=MULTISYSTEM
  ```

  must be defined in SYS1.PARMLIB(IEASYS*xx*).
- for stand-alone systems

  ```
  PLEXCFG=MONOPLEX
  ```

  must be defined in SYS1.PARMLIB(IEASYS*xx*).

Next, the LOGR couple data sets must be formatted — if this has not already been done. For this task you can use the sample JCL provided in the HSAJFCDS member of the sample library.

To define the log stream in:

- a single system environment, use the sample JCL provided in member HSAJDLGM (for the automation manager)
- a sysplex, use the sample JCL provided in member HSAJDLGS (for the automation manager)

In both cases you may want to adapt the HLQ parameter in the LOGR policy according to your environment. The default is IXGLOGR. Use the corresponding INGJD*xxx* members as input and make the changes accordingly.

Step 12: Customizing the System Logger

For a sysplex environment, you must additionally add the log structures to the CFRM policy:

```
STRUCTURE   NAME(HSA_LOG)
            SIZE(8192)
            PREFLIST(cfname,cfname)
```

In this CFRM policy, you have to adapt the PREFLIST for structure HSA_LOG if you are setting up the system logger. Also adapt the SIZE parameter to a recommended minimum of 8 megabytes (8M).

The system logger must be authorized. If it is not yet assigned either privileged or trusted RACF status, or both, refer to chapter *Planning for System Logger Applications* in *z/OS MVS Setting Up a Sysplex* for more information on how to define authorization to system logger resources. The names of the system logger resources used by SA z/OS are *HSA.MESSAGE.LOG* and *HSA.WORKITEM.HISTORY*.

The NetView agents and the automation manager address spaces need to be authorized for accessing the log streams. They need update access for

```
RESOURCE(logstream_name)
CLASS(LOGSTRM)
```

where *logstream_name* stands for *HSA.MESSAGE.LOG* as well as for *HSA.WORKITEM.HISTORY*.

For further information see section *Define Authorization to System Logger Resources* in *z/OS MVS Setting Up a Sysplex*.

Now activate the couple data sets via the console commands:

```
SETXCF COUPLE,TYPE=LOGR,PCOUPLE=(primary_couple_data_set)
SETXCF COUPLE,TYPE=LOGR,ACOUPLE=(alternate_couple_data_set)
```

For a sysplex, after defining the new structure in the CFRM policy, activate the CFRM policy via:

```
SETXCF START,POLICY,TYPE=CFRM,POLNAME=policy_name
```

Step 13: Install ISPF Dialog Panels

SysOps	ProcOps	I/O Ops
✔	✔	✔

Note

The member AOFTPOL should be deleted from any user ISPF table library.

This step is required at least on the customization focal point and on any system where you want to use the customization dialog. It is recommended that you do not move any SA z/OS policy databases between systems because of synchronization problems.

SA z/OS ships two types of ISPF dialogs: one for I/O operations and one for defining automation policy. The I/O operations panels are used for I/O functions. The customization dialog is used to create configuration and automation definitions.

The I/O operations and customization dialog are both invoked using the INGDLG exec. This exec provides parameters for selection of the appropriate dialogs. In addition, this exec can optionally be used to allocate the required dialog libraries. INGDLG should be invoked from an ISPF menu or from a user-defined TSO REXX exec. See Appendix G, "INGDLG Command," on page 227 for more details.

Since you use the customization dialog to collect information and build control files, you normally need them only at the focal point. However, as the customization dialog allows editing of specific entry types by multiple users, you also need to observe the instructions given in the appendix *Problem Determination* in *IBM Tivoli System Automation for z/OS User's Guide*.

The I/O operations dialogs, however, are used to input commands and get responses from the I/O operations part of SA z/OS. Since they do not support multisystem commands for I/O operations functions, you must install them on each system, focal point or target, where you wish to use them. Alternatively, you can use the workstation window set to access I/O operations function.

Step 13A: Allocate Libraries for the Dialogs

SysOps	ProcOps	I/O Ops
✓	✓	✓

To set up the dialogs, you must allocate the REXX load libraries and customization dialog load libraries. This section describes the two alternative options available:

- **Alternative 1:** Dynamic allocation of the libraries using the INGDLG exec
- **Alternative 2:** Allocation of the libraries as part of the TSO logon procedure

Remember:
Throughout "Step 13: Install ISPF Dialog Panels" on page 118 use the names of the data sets as created in "Step 3: Allocate Data Sets for the Customization Dialog" on page 88.

Alternative 1: Dynamic Allocation using INGDLG

This exec performs allocations prior to starting the dialogs. In order to invoke the exec, you need to be in ISPF. The INGDLG command parameters describe where the data sets are found. See Figure 30 on page 227 for the use of INGDLG to allocate libraries.

Note that if you use INGDLG to allocate libraries, you must still perform allocation of the ISPF product libraries as described in "Alternative 2: Add to the TSO Logon Procedure."

Alternative 2: Add to the TSO Logon Procedure

Create a new TSO logon procedure that has the SA z/OS data sets in the appropriate concatenations.

To create a TSO logon procedure, take an existing one and modify its DD statements to include the following:

```
//ISPPLIB    DD ...
             DD DSN=ING.SINGIPNL,DISP=SHR
             DD ...

//ISPMLIB    DD ...
             DD DSN=ING.SINGIMSG,DISP=SHR
             DD ...

//ISPSLIB    DD ...
             DD DSN=ING.SINGISKL,DISP=SHR
             DD ...

//ISPTLIB    DD ...
             DD DSN=ING.CUSTOM.AOFTABL,DISP=SHR  1
             DD DSN=ING.SINGITBL,DISP=SHR
             DD ...

//ISPLLIB    DD ...
             DD DSN=ING.SINGMOD1,DISP=SHR
             DD ...

//SYSPROC    DD ...
             DD DSN=ING.SINGIREX,DISP=SHR
             DD ...

//AOFTABL    DD DSN=ING.CUSTOM.AOFTABL,DISP=SHR  1

//AOFPRINT   DD SYSOUT=...  2

//AOFIPDB    DD DSN=ING.SINGIPDB,DISP=SHR  3

//IHVCONF    DD DSN=ING.CUSTOM.IHVCONF,DISP=SHR  4
```

Notes:

1. Ensure that your ISPF temporary data sets have been allocated with enough space.
   - When a build of the automation control file is performed, each file is written to the temporary data sets before it is copied into the target data set. This can lead to a temporary data set many thousands of lines long. For an enterprise with many processors, there may be several hundred thousand lines written to the temporary data set. These are in the ISPWRK data sets. See *z/OS ISPF Planning and Customizing* for more information, where it is recommended that you pre-allocate to VIO however, because it reduces overhead and eliminates potential problems from insufficient space.
   - The ISPCTL1 temporary data set is used by SA z/OS to hold output created by a data model report and to hold the JCL for batch submission of an ACF Build job. See *z/OS ISPF Planning and Customizing* for more information on the ISPCTL1 data set.
2. Ensure that the ISPF table output library ISPTABL is allocated. SA z/OS uses this table output library for temporary tables created by the customization dialogs. The table output library must be a partitioned data set. The data set allocated to ISPTABL must also be in the sequence of data sets allocated to ISPTLIB. It is recommended that the first data set allocated to ISPTLIB must be user specific to avoid multiuser conflicts. This is mandatory because when ISPF opens a table, it requests an enqueue for a resource name that consists of a table name and the first data set allocated to ISPTLIB. For more information, see *z/OS ISPF User's Guide Vol I*.

3. The ellipses (...) in the DD-statements indicate the presence of more information in the JCL: for example, other data sets in a concatenation.
4. User-specific data sets should be placed before the SA z/OS data sets. Generally speaking you need to take care that the concatenation of the SA z/OS data sets does not interfere with the concatenation with data sets from other products.
5. You should **not** include data sets for any predecessor products, AOC/MVS, TSCF, or ESCON Manager, anywhere in the concatenation.
6. The AOFTABL DD statement (**1**) is required as soon as you intend to customize your environment: this data set stores ISPF tables containing unique information created when you use the customization dialog. ING.CUSTOM.AOFTABL, allocated in "Step 3: Allocate Data Sets for the Customization Dialog" on page 88, is used to hold new and modified ISPF tables created when the administrator modifies or changes the SA z/OS policy definitions from the SA z/OS customization dialog.Because changes in the SA z/OS policy definitions and ISPF tables might often occur, this makes it a required DD statement and the data set must be unique for each TSO user. This data set is also used to hold the data set definitions for batch processing. This data set was allocated by you in the sample INGEDLGA (see "Step 3: Allocate Data Sets for the Customization Dialog" on page 88).
7. The AOFPRINT DD statement (**2**) is used in place of SYSPRINT for IEBUPDTE, which is invoked when a user of the customization dialog creates a policy database using an SA z/OS-supplied sample as a model. If this DD statement is not allocated, SA z/OS allocates the DD as SYSOUT=H.

   If the IEBUPDTE invocation is successful and SA z/OS dynamically allocated the AOFPRINT file as SYSOUT=H, the output is purged. If the invocation fails, the output is saved for use in diagnosis of the problem.

   When specifying `AOFPRINT(SYSOUT(Cls))`, the output of the dynamically called IEBUPDATE utility is placed in the JES output class *Cls*. This output is not purged.
8. The AOFIPDB DD statement (**3**) points to the SA z/OS sample library.

   The AOFIPDB DD statement is required for building system operations control files (automation control file and automation manager configuration file). It must point to a single data set, not a concatenation. In SA z/OS, this data set is required, even if you do not use any sample policy databases. AOFIPDB contains the automation manager logic deck INGLOGIC.
9. IHVCONF (**4**), is required for I/O operations. If you are not using I/O operations this DD statement is optional.
10. You should not use any DD names starting with AOF in your logon procedure except those specified in the example above. This is because the SA z/OS customization dialog may dynamically generate AOF*xxxxx* DD names. Specifically, SA z/OS generates AOFIN and AOFUT2 DD names.
11. I/O operations ISPF dialogs use REXX execs that invoke I/O operations commands and ISPF services. These execs must be made available to the users who want to use the ISPF dialogs. Note that the default record format of the I/O operations REXX target library (whose name is SINGIREX) is FB. The data sets in your SYSPROC concatenation might not be FB. If this is the case, the ALLOCATE command can be used, but you are not able to execute the differently formatted or sized execs. You can do one of the following to correct this:

    a. Copy the contents of the SINGIREX exec library to another data set that is already in your SYSPROC concatenation.

b. Copy the contents of the SINGIREX exec library to a new data set that has the same characteristics as the other data sets in your SYSPROC concatenation.

If you already use a CLIST to allocate your data sets for ISPF, modify it to include the SA z/OS data sets in the appropriate concatenations for users of the customization dialog. If you wish to create a CLIST to allocate your data sets you should find out your current allocations for the DD names that need SA z/OS data sets allocated to them. This can be done with the LISTALC STATUS command.

Step 13B: Invoking the ISPF Dialogs

SysOps	ProcOps	I/O Ops
✓	✓	✓

The ISPF Application Selection Menu can be modified to include options for the system operations and processor operations customization dialog and for the I/O operations dialogs. These options allow a user to begin the customization dialog without having to issue commands at the TSO prompt.

Two changes are required to add the dialogs to the ISPF Application Selection Menu panel (see also Figure 16):
- Adding selections to the menu
- Adding logic to the panel processing to invoke the appropriate dialogs

Both sets of dialogs are invoked by the INGDLG command. Parameters of this command determine which set of dialogs is invoked.
- Add the command dialogs selections to an ISPF menu panel, such as the ISPF Master Application Menu panel (ISP@MSTR) or the ISPF Primary Menu panel (ISP@PRIM).

  Note: If you use a customized, non-standard ISPF primary menu panel, modify the definition for that panel instead of ISP@MSTR or ISP@PRIM.

  See *z/OS ISPF Planning and Customizing* for information about customizing ISPF panels. The modified panel should be placed in a data set so that it is used by all users who have the dialog data sets in their concatenation, but it is not used by anyone who does not. You may want to copy it into an enterprise-specific panel data set that you allocate in front of your normal ISPF panel data sets. Figure 16 is an example of what a modified panel might look like.

```
-----------ISPF APPLICATION SELECTION MENU---------------------------------
OPTION ===> ____________________________________________________
                                                    VERSION  ISPF5.5
  0  ISPF PARMS - Specify terminal and user parameters   USERID   OPER1
  1  BROWSE     - Display source data or output listings  TIME     16:23
  2  EDIT       - Create or change source data           TERMINAL 3278
  3  UTILITIES  - Perform utility functions
:
  C  CUSTOMIZE  - SA z/OS customization dialog
  I  I/O-Ops    - SA z/OS I/O Operations
  T  TUTORIAL   - Display information about ISPF/PDF
  X  EXIT       - Terminate ISPF using log and list defaults

Enter END command to terminate ISPF.
```

Figure 16. ISPF Application Selection Menu

The options for the customization dialog and the I/O operations dialogs must also be added to the panel processing section of the ISPF Application Selection Menu panel as follows. The lines you add are written in italics in the example. You can select the character used to specify the dialogs on your menu.

Using TSO Logon or Your CLIST

This is the example to be followed if you allocated the data sets using the TSO logon procedure or using a CLIST of your own.

```
)PROC
&ZQ = &Z
IF (&ZCMD ^= ' ')
&ZQ = TRUNC(&ZCMD,'.')
IF (&ZQ = ' ')
 .MSG = ISRUOOO
&ZSEL = TRANS( &ZQ
0,'PANEL(ISPOPTA)'
:
C,'CMD(INGDLG SELECT(ADMIN) ALLOCATE(NO))'
I,'CMD(INGDLG SELECT(IOCONNECT) ALLOCATE(NO))'
T,'PGM(ISPTUTOR) PARM(ISR00000)'
:
X,'EXIT'
*,'?' )
&ZTRAIL = .TRAIL
)END
```

Using INGDLG

If you let INGDLG, described in Figure 30 on page 227, allocate the data sets dynamically prior to starting the dialogs, the following is a sample definition to be added to the ISPF processing section:

```
C,'CMD(EXEC ''ING.SINGIREX(INGDLG)'' +
  ''HLQ(MYHLQ)                      +
    AOFTABL(ING.CUSTOM.AOFTABL)     +
    SELECT(ADMIN)'')'
I,'CMD(EXEC ''ING.SINGIREX(INGDLG)'' +
  ''HLQ(MYHLQ)                      +
    IHVCONF(ING.CUSTOM.IHVCONF)     +
    SELECT(IOCONNECT)'')'
```

Alternatively, you can invoke the dialogs using TSO REXX execs:

```
/* REXX ADMIN */
ADDRESS ISPEXEC "SELECT CMD(EXEC 'ING.SINGIREX(INGDLG)'          " ,
"'HLQ(ING)                        " ,
/* HLQ is the hlq of the SMP/E output data sets */
" AOFTABL(ING.CUSTOM.AOFTABL)    " ,
" SELECT(ADMIN)                 ')"
```

```
/* REXX IOCONNECT */
ADDRESS ISPEXEC "SELECT CMD(EXEC 'ING SINGIREX(INGDLG)'          ",
"'HLQ(ING)                        ",
/* HLQ is the hlq of the SMP/E output data sets */
" IHVCONF(ING.CUSTOM.IHVCONF)    ",
" SELECT(IOCONNECT)             ')"
```

Step 13C: Reconvert I/O Operations Panels

SysOps	ProcOps	I/O Ops
		*

The I/O operations dialog panels are defined using Dialog Tag Language (DTL) for ISPF. Both the source panels and converted panels are provided in the product libraries. If you choose to update the panels, the source panels must then be reconverted.

Step 13D: Verify the ISPF Dialog Installation

SysOps	ProcOps	I/O Ops
✔	✔	✔

Logon to TSO using your modified logon procedure or running your data set allocation CLIST.

Access the customization dialog from the ISPF main menu that you defined. From the ***Customization Dialog Primary Menu*** that will appear, select option ***4 Policies*** to see a screen that looks similar to Figure 17.

```
  MENU  COMMANDS  ACTIONS  VIEW  HELP
------------------------------------------------------------------------------
AOFGPDB                    Policy Database Selection              Row 1 of 2
Command ===> _____________________________________________  SCROLL===> PAGE

Action     Policy Database      Enterprise Name/Data Set Name
_________  DATABASE_NAME_1      YOUR_ENTERPRISE_1
_________  DATABASE_NAME_2      YOUR_ENTERPRISE_2
****************************** Bottom of data ********************************
```

Figure 17. Policy Database Selection Screen

A screen similar to the one shown in Figure 18 will be displayed if you run the REXX exec *IOCONNECT* shown on page 123. You can use the information shown to verify your SA z/OS installation.

```
  Modify  View  Locking  Options  Help
------------------------------------------------------------------------
IHVMMU                    SA z/OS - I/O Operations
Command ===> ____________________________________________________________



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        5698-SA3
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I/O-Ops
Command  . . ____________________________________________________________
```

Figure 18. I/O Operations Initialization Panel

Step 14: Verify the Number of available REXX Environments

SysOps	ProcOps	I/O Ops
✔	✔	

Change the value of the maximum number of available REXX environments to at least 400. The variables to do this are in the sample assembly and linkedit job in SYS1.SAMPLIB(IRXTSMPE). Change the value of the ENTRYNUM= parameter to at least 400. The sample is a user exit, so follow your SMP/E process for handling user exits. See also "Allocation Requirements for REXX Environments" on page 42.

Step 15: Customization of NetView for TEC Notification by SA z/OS

SysOps	ProcOps	I/O Ops
*		

This section describes the customization steps specific for TEC Notification by SA z/OS of all involved products:

- NetView
- SA z/OS

Depending on whether SA z/OS messages are forwarded to a local Message Adapter and Alert Adapter, or a message has to be forwarded to the SA z/OS focal point system running the Message Adapter, the NetView customization is different:

- In a *local configuration*, there is only one operator and you can use the default operator ID AUTOTEC.
- In a *distributed configuration*, you need to define a different operator ID on each target system. If the focal point is also configured as a target system that triggers messages and alerts, you need to define another different operator ID on the focal point itself. In case of a distributed configuration, you need to adapt the synonym table.

  All operator IDs of all target systems must be defined on the focal point.

Review the synonyms for TEC Notification by SA z/OS and set all listed synonyms to their appropriate value.

- %AOFTECTASK% and %AOFTECTASKQ%

  This is the name of the autotask for sending SA z/OS events to the Tivoli Enterprise Console. It is the operator ID you defined in your configuration. The default is `AUTOTEC`.
- %AOFTECPPI%

  This is the NetView PPI Receiver ID of the message adapter (with quotes). The default is `IHSATEC`.
- %AOFTECMODE%

  This is the event generation mode (with quotes). Possible values are:
  - LOCAL: the message adapter is running on *this* system. LOCAL is valid for the *local configuration* ("Environment Configurations" on page 55) and for the focal point in the *distributed configuration*.
  - REMOTE: the message adapter is running on a remote automation focal point. SA z/OS messages will be generated on **this** target system and forwarded to a *remote* automation focal point system. There is no local GEM message adapter which can process SA z/OS messages. REMOTE is valid for the target system in a *distributed configuration* ("Environment Configurations" on page 55).

  The default is `LOCAL`.

Modifying Existing Files

Table 21 shows all product files which need to be modified.

Table 21. Product Files to be Modified

File Name	DD Name	Description
AOFMSGSY	DSIPARM	synonyms used within the automation table
AOFOPFSO	DSIPARM	operator definitions

AOFMSGSY

Locate the automation fragment `AOFMSGSY` to update the required synonyms. See *IBM Tivoli System Automation for z/OS Customizing and Programming* for more information.

Customizing the Auto Operators Policy Object

Define the auto operator AUTOTEC using the SA z/OS customization dialog **Automation Operator Definitions**.

For a complete description of the required dialogs, refer to *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Customizing the System Policy Object

You must define INGMTEC as additional automation table, using the SA z/OS customization dialog **Environment Setup** (policy selection AUTOMATION SETUP).

For a complete description of the required dialogs, refer to *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Removing Messages

You may want to remove a message from the set of mapped messages. To do this, you only need to remove the *IF ... THEN* statement corresponding to the affected message from file *INGMTEC*.

Customization of NetView Event/Automation Service

This section describes how to customize NetView Event/Automation Service, namely the message adapter and the alert adapter for messages and alerts from SA z/OS.

Modifying Event/Automation Service Files

Table 22 shows all product files which need to be modified.

Table 22. Product Files to be modified

Member Name	DD Name	Description
IHSAINIT	IHSSMP3	initialization file for the Event/Automation Service
IHSAMCFG	IHSSMP3	message adapter configuration file
IHSAACFG	IHSSMP3	alert adapter configuration file
IHSAMFMT	IHSSMP3	message adapter format file
IHSAACDS	IHSSMP3	alert adapter CDS file

Table 22. Product Files to be modified (continued)

Member Name	DD Name	Description
IHSAECFG	IHSSMP3	Event Receiver Configuration file

The following is a brief list of steps needed to customize the Event/Automation Service for SA z/OS specific message/alert routing. For detailed guidance see the chapter Customizing Event/Automation Service in the *Tivoli NetView Customization Guide* .

1. Adapt the initialization file for the Event/Automation Service IHSAINIT. At least the following values have to be defined:
   - *ALRTCFG*: specifies the alert adapter configuration, for example: `ALRTCFG=IHSAACFG`
   - *MSGCFG*: specifies the message adapter configuration file, for example: `MSGCFG=IHSAMCFG`
   - *PPI*: specifies the PPI receiver ID used by the Event/Automation Service, for example: `PPI=IHSATEC`
   - Make sure that the NOSTART statements for the tasks ALERTA and MESSAGEA are not commented out.

   The values given here are examples only. They will be further used within this chapter.

   Note: The *PPI* receiver ID for the Message Adapter specified here must be the same as the one defined in the synonym section of the NetView automation table.
2. Adapt the message adapter configuration file IHSAMCFG. You must at least define:

   `ServerLocation=`*`Hostname or IP address of your TEC Event Server`*

   If the port mapper is not available on the event server, the port number must be specified in the statement

   `ServerPort=`*`port number`*
3. Adapt the alert adapter configuration file IHSAACFG. You must at least define:

   `ServerLocation=`*`Hostname or IP address of your TEC Event Server`*

   If the port mapper is not available on the event server, the port number must be specified in the statement

   `ServerPort=`*`port number`*
4. Insert the include statement shown in Figure 19 at the end of the Event/Automation Service format file IHSAMFMT. This will activate the message/event mapping defined in the message adapter format file *INGMFMT* for SA z/OS messages.

```
/* ------------------------------------------------------------------ */
/* System Automation for z/OS (AOF) message to TEC event mapping      */
/* ------------------------------------------------------------------ */
%INCLUDE INGMFMT
```

Figure 19. Format File Include Statement

5. Insert the include statement shown in Figure 20 on page 128 into the Event/Automation Service CDS file IHSAACDS to activate the alert / event mapping. Make sure

the SA z/OS specific statements precede the more general statements of the same class. This can be achieved by inserting the include statement at the top of file *INGACDS*.

```
/* ------------------------------------------------------------------ */
/* System Automation for z/OS (AOF) message to TEC event mapping      */
/* ------------------------------------------------------------------ */
%INCLUDE INGACDS
```

Figure 20. CDS File Include Statement

6. Adapt the Event Receiver Configuration file IHSAECFG. You must at least define: *NetViewAlertReceiver=NETVALRT*

Step 16: Compile SA z/OS REXX Procedures

SysOps	ProcOps	I/O Ops
*	*	

You should perform this step to gain considerable performance improvement for system operations startup.

You can optionally compile the SA z/OS automation procedures, which are written in REXX. The decision to compile the SA z/OS automation procedures implies an added responsibility for recompiling whenever ING.SINGNREX members are affected by SMP/E maintenance. To compile and execute these automation procedures, the IBM Compiler and Library for REXX/370 must be installed on your system along with their prerequisite products.

The JCL job INGEREXR and related routine INGEREXC are provided in the SA z/OS sample library to help you compile the ING.SINGNREX members. Modify the data set names and jobcard in INGEREXR as necessary and submit the job. The ING.SINGNREX.CREXX library can be modelled on ING.SINGNREX, and ING.SINGNREX.LIST should be a VBA LRECL 125 PDS library. If necessary add to the SYSEXEC DD statement the library where the REXXC program can be found. Finally, specify the name of the resulting compiled-REXX data set in your NetView application startup procedure.

Note

Module INGRVXMT must *not* be compiled.

Consult the *REXX/370 User's Guide and Reference R3* (SH19-8160) for the compiler options that apply to your installation. If necessary, change the INGEREXC routine accordingly.

Step 17: Defining Automation Policy

SysOps	ProcOps	I/O Ops
✔	✔	

Before you can start using automation, you need to define your automation policy using the customization dialog. This involves the following actions:

- If applicable, migrate/merge existing policy information; you can use the sample job INGEBMIG in the SINGSAMP sample library.
- Add further policy definitions
- Build a new policy database
- Distribute the policy definitions (the policy database) where required.

If you start from scratch, use the IBM samples delivered with the product and create your new policy database. In such a case, read the information in the section *Creating a New Policy Database* in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Then invoke the customization dialog to define your automation policy. Start by defining the following policy objects:

- Applications
- Application groups
- Processors
- Systems
- System defaults
- A group for each sysplex

You will find detailed information on how to perform these steps in *IBM Tivoli System Automation for z/OS Defining Automation Policy* which provides information on using the customization dialog for the required definitions.

Step 17A: Build the Control Files

When the policies for the SA z/OS components have been defined, use the BUILD command to create the system operations control files (automation control file and automation manager configuration file, needed for automation), processor operations control file and NetView operator definitions. The BUILD command is available from various panels of the customization dialog. For more information on how to perform this step, refer to the manual *IBM Tivoli System Automation for z/OS Defining Automation Policy*. You can use the sample job INGEBBLD in the SINGSAMP sample library.

Note:
It is mandatory to use the SA z/OS customization dialog to create policy objects for the resources you want to automate. Do not edit the automation control files (ACF) manually.

A manually edited automation control file cannot be used to start SA z/OS.

Step 17B: Distribute System Operations Control Files

The system operations control files consist of the automation control file and the automation manager configuration file. You need to make the control files available to the automation agents and automation managers on the target systems. All automation managers and automation agents within the same sysplex must have access to the same system operations control files or a copy of them. You must send the files to the target sysplexes and make the data available to the automation agents and the automation managers. For the automation agents, it can either be in

the DSIPARM concatenation or in a separate data set which has the same name as that known to the automation manager. For the automation managers it can either be placed within the automation managers' current configuration data set or the automation managers can be told to use a new configuration data set.

Step 18: Define Host-to-Host Communications

SysOps	ProcOps	I/O Ops
✓	✓	✓

VTAM definitions are required for both host-to-host communications and host-to-workstation communications. This section of the installation addresses the host-to-host communications.

Verify that your NetView APPL member is consistent with the steps that follow.

The host-to-host communications require:
- Defining each host as a CDRM
- Defining the host ACB

Step 18A: Customize the SYS1.VTAMLST Data Set

SysOps	ProcOps	I/O Ops
✓	✓	

Edit the member that defines NetView to VTAM and do the following:

1. Include as many NetView operator subtask APPL statements as you defined operators in the DSIOPF member of the NetView DSIPARM data set.
2. SA uses the NetView BGNSESS command with parameter SRCLU=* to create terminal access facility (TAF) full-screen sessions for communication with OMEGAMON monitors, if requested. Include one model terminal access facility (TAF) APPL statement to let NetView define the application dynamically, for example:

   ```
   TFxx#*    APPL MODETAB=AMODETAB,EAS=9,                              X
                  DLOGMOD=M2SDLCNQ
   ```

   where xx are the last two characters of the domain ID. See *Tivoli NetView for z/OS Installation: Configuring Additional Components* and *z/OS Communications Server: SNA Network Implementation Guide* for more details.
3. Define the NetView primary program operator interface task (PPT) as AUTH=(NVPACE,SPO). This causes unsolicited VTAM messages to be broadcast on the SSI and therefore be available to NetView. If, however, you have another NetView defined as a primary program operator application program (PPO), then it receives unsolicited messages first and messages do not reach the secondary program operator application program (SPO) defined NetView. See *Tivoli NetView for z/OS Installation and Administration* for information on PPO and SPO definitions.

For each target hardware, defined with an SNA based NVC connection to the processor operations focal point, VTAM majornode definitions are required to enable the hardware access for processor operations. Appendix D, "Processor Operations Sample," on page 205 illustrates this for an OSA adapter being the

SNA gateway for the Support Elements and the definition of an SE as a VTAM Switched Majnode. For other VTAM definition examples, refer to *Managing Your Processors*, (GC38-0452-08).

Step 18B: Perform VTAM Definitions

SysOps	ProcOps	I/O Ops
		✔

Note: This applies to I/O operations host-to-host communications only. If you have configured a prior level of ESCON Manager, these definitions remain the same.

In order to use VTAM for I/O operations, there are some definitions that VTAM requires. These definitions are in addition to those needed for the installation and running of VTAM. If you already have VTAM installed, some of these definitions may already exist.

The I/O operations program in each host that carries on this communication must be defined as a VTAM application in each host. The I/O operations program that it communicates with in another host must be defined as a cross domain resource. I/O operations uses the LU 0 protocol for the communication between hosts and the LU 6.2 protocol for host-to-workstation communications.

Since the means of the I/O operations program may be a channel-to-channel adapter, this connection has to be defined to VTAM via VTAM definition statements.

If the alternate path used is via a network communications program (NCP), then the NCP must be defined to VTAM.

In order for VTAM, to choose what routes to use for this communication and what priorities to assign, PATH statements and CLASS OF SERVICE must be defined.

An example of some of these VTAM definition statements will be shown in the following picture as an example.

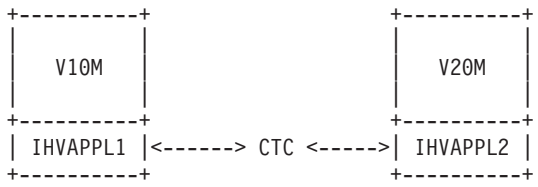


Figure 21. VTAM Definition Statements

In this example, there are two hosts running I/O operations. One application is named IHVAPPL1 and is in subarea 10. The second application is named IHVAPPL2 and is in subarea 20. Each host has its own set of VTAM definition statements.

```
V10M                              V20M
____                              ____

      VBUILD  TYPE=CDRM     |
V10M  CDRM    SUBAREA=10    |---> Same statements in this host.
V20M  CDRM    SUBAREA=
```

Step 18: Define Host-to-Host Communications

The appropriate definitions are needed for each host that will be communicating via I/O operations. Each host will be defined as a CDRM.

If a communication path between the hosts is a channel to channel adapter, this has to be defined to VTAM.

Note: Change each "*x*" to the appropriate value.

```
CTCV20  VBUILD  TYPE=CA
label1  GROUP   LNCTL=CTCA,
                DELAY=x,
                MIH=x,        (cause link to inop if
                               sio timeout occurs)
                REPLYTO=x     (tells vtam how long to
                               wait for completion after
                               channel program started)
label2  LINE    ADDRESS=x,    (channel unit address of
                               channel to channel adapter)
                MAXBFRU=x     (# of buffers vtam will use to
                               receive data)
label3  PU      PUTYPE=4,TG=1
```

Each I/O operations program must be defined via an application statement in each host. The customer specified names must be unique in the network. These are the names by which each I/O operations will be known by the other I/O operations hosts.

The ACBNAME parameter is required for I/O operations this name must be IHVISC, and this name must be reserved for this use only.

The parameters SONSCIP=YES and AUTH=ACQ must also be specified.

For I/O operations it is strongly recommended that the DLOGMODE parameter and the MODETAB parameter given in the example, or equivalent definitions should be used. For your information: A RUSIZE of 'zero' is used with this LU TYPE 0 protocol.

```
       VBUILD TYPE=APPL          |        VBUILD TYPE=APPL
IHVAPPL1 APPL ACBNAME=IHVISC,    | IHVAPPL2 APPL ACBNAME=IHVISC,
              AUTH=ACQ,          |               AUTH=ACQ,
              SONSCIP=YES,       |               SONSCIP=YES,
              DLOGMOD=INTERACT,  |               DLOGMOD=INTERACT,
              .                  |               .
              .                  |               .
              MODETAB=ISTINCLM   |               MODETAB=ISTINCLM
```

Using the above VTAM definitions the LOGMODE table entry would be,

```
IBM3767  MODEENT LOGMODE=INTERACT,FMPROF=X'03',TSPROF=X'03',
PRIPROT=X'B1',SECPROT=X'A0',COMPROT=X'3040'
```

Each host must have a cross-domain definition for the other I/O operations host applications. They are defined as cross domain resources.

```
VBUILD  TYPE=CDRSC               |         VBUILD  TYPE=CDRSC
IHVAPPL2 CDRSC  CDRM=V20M        | IHVAPPL1 CDRSC  CDRM
M
```

The communication paths between the I/O operations hosts must be defined.

```
PATH  DESTSA=20          |          PATH  DESTSA=10
ER0=(20,1)               |          ER0=(10,1)
ER1=(20,1)               |          ER1=(10,1)
VR0=1                    |          VR0=1
VR1=0                    |          VR1=0
```

The CLASS OF SERVICE definition:

```
ISTSDCOS COSTAB                 | ISTSDCOS COSTAB
         .                      |          .
         .                      |          .
         .                      |          .
IHVAPPL1 COS VR=((0,2),(1,2))   | IHVAPPL2 COS VR=((0,2),(1,2))
         .                      |          .
         .                      |          .
         COSEND                 |          COSEND
```

In addition to the VTAM definitions, you need to define the APPC/MVS environment to allow I/O operations functions on the focal point to communicate with I/O operations functions at the SA z/OS workstation. Refer to *Multiplatform APPC Configuration Guide* for help in doing this.

Step 19: Enabling SA z/OS to Restart Automatic Restart Manager Enabled Subsystems

SysOps	ProcOps	I/O Ops
*		

If you intend to use the z/OS Automatic Restart Manager and you wish to coordinate its actions with those of SA z/OS, you must ensure the following:

- The SA z/OS-supplied element restart exit (ERE) must be available to z/OS. The exit, AOFPERRE, is in the ING.SINGMOD2 data set. No customization is required.
- The AOFARCAT autotask must be created. The autotask name is included in the AOFOPF member and is created automatically by NetView if you install SA z/OS without changing AOFOPF.
- The NetView Subsystem Support Interface (SSI) must be active for the coordination of SA z/OS and z/OS automatic restart management to occur.
- As part of its Automatic Restart Manager support, SA z/OS claims all PPI receiver IDs starting with AOF. If you have any other PPI receivers named AOF*xxxx*, results are unpredictable.

For further information on the relationship between key; and Automatic Restart Manager, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Step 20: Define Security

SysOps	ProcOps	I/O Ops
*	*	

Note:
To plan your RMTCMD-based INGSEND security, see the discussion of RMTCMD security features in the NetView library.

You should perform this step if you want to ensure that only authorized staff can manage the resources in your environment.

When you define your SA z/OS environment, you need to ensure that both your operations staff and your automation facilities are authorized to manage the resources in that environment. You can control human and automation operator authority using the NetView operator definition file (DSIOPF) or a security product, such as RACF. Both of these facilities provide password security to control access by operators.

The following is recommended:

- Use NetView facilities to limit the use of commands and keywords to authorized operators or to limit (to specific systems) an operator's span of control
- Control access to the NMC workstation with a user ID, password, and RODM access information
- Include logic in the NetView automation table or in your automation routines to verify the source of a message before taking an action
- Use RACF to limit the use of z/OS system commands to authorized operators

Refer to "Operator Profiles" on page 169 for details.

For SNMP, BCP internal interface, and TCP/IP connections, it is mandatory to make the security definitions described in "Controlling Access to the Processor Hardware Functions" on page 183.

For UNIX System Services automation, one or more UNIX segments (OMVS) must be defined. For details, refer to "Step 31A: Define UNIX Segments (OMVS)" on page 154.

Step 21: Customize the Status Display Facility (SDF)

SysOps	ProcOps	I/O Ops
*		

If you decide to use SDF as the SA z/OS full-screen operator interface for monitoring automated resource statuses at the NetView 3270 console, then customizing SDF involves defining the following:

- SDF initialization parameters. These are defined in the AOFINIT member of a NetView DSIPARM data set.
- Resource hierarchy or tree structure. The AOFTREE member of a NetView DSIPARM data set includes the appropriate tree members, which contain the resource hierarchy information.
- Color and priority assignments for resource status types. These have default values set up by SA z/OS (see *IBM Tivoli System Automation for z/OS User's Guide* for details), but overrides to color and priority assignments can be defined by the user using the SA z/OS customization dialog.

- SDFROOT. A root name for the SDF tree can be specified on the Environment Setup Panel of the customization dialog. If you do not specify a new root name, it defaults to the value specified for SYSNAME.

See *IBM Tivoli System Automation for z/OS Customizing and Programming* for detailed information about customizing SDF.

Step 22: Check for Required IPL

SysOps	ProcOps	I/O Ops
✓	✓	✓

An IPL is only required if:

- in "Step 4D: Update LPALST*xx*" on page 92 you did ***not*** decide to use the solution to dynamically add the modules to the LPALST
- in "Step 4E: Update LNKLST*xx*" on page 92 you updated LNKLST and you did ***not*** decide to use the solution to dynamically add the modules to the LNKLST
- "Step 4F: Update IEFSSN*xx*" on page 93 has been required because the IEFSSN*xx* member has not been updated during NetView installation and you cannot use the z/OS command SETSSI for a dynamic update of the subsystem name table.

Step 23: Automate System Operations Startup

SysOps	ProcOps	I/O Ops
✓	✓	

Add commands to the COMMND*xx* member of SYS1.PARMLIB to start the automation NetView when z/OS starts. You may also need to modify an IEASYS*xx* member of SYS1.PARMLIB to specify which COMMND*xx* or other PARMLIB members to use during IPL. SA z/OS initialization begins with starting system operations. If an SA z/OS automation policy is used, system operations subsequently starts processor operations and I/O operations.

Make the described changes to the following SYS1.PARMLIB data set members:

COMMND*xx*

Make sure that the procedure names you choose match those specified in the SYS1.PROCLIB data set.

Compare the contents of the COMMND*xx* member with the INGECOM member which resides in the SINGSAMP sample library. Edit the COMMND*xx* member and do the following:

1. If you want to use the recording of IPL function (INGPLEX IPL command) add the following statement in the COMMND*xx* member:

   ```
   COM='S HSAPIPLC,SUB=MSTR'
   ```

   This procedure collects the IPL information in MVS. Return codes for this procedure are documented within the HSAPIPLC sample.
2. If you are running more than one NetView on your system, ensure that you have included start commands for the Automation NetView.

```
COM='S NETVSSI,SUB=MSTR'
COM='S NETVSTRT,SUB=MSTR'
```

Note:
NETVSSI here is a placeholder for the name of the member to which you copied the NetView subsystem interface startup procedure in "Step 6: Customize SYS1.PROCLIB Members" on page 96.

NETVSTRT here is a placeholder for the name of the member to which you copied the NetView application startup procedure in "Step 6: Customize SYS1.PROCLIB Members" on page 96.

This adds commands that select the correct MPF entries and that start NetView.

IEASYS*xx*

Edit the IEASYS*xx* member to specify which SYS1.PARMLIB data set members to use during the IPL process. This is done by specifying the 2-character suffix of the SYS1.PARMLIB member names. If you choose SO, then the statements in the IEASYS*xx* member would be as follows:

APF=SO
CMD=SO
CON=SO
SSN=SO
SCH=SO
LNK=SO
LPA=SO

For example, because APF=SO, the system uses the IEAAPFSO member during the IPL process.

How to Automate the Automation Manager Startup

Note: The system on which the automation manager should be started must be defined as policy object *System* in the policy database which will be used to create the automation manager configuration file that this automation manager uses (see also "Step 17A: Build the Control Files" on page 129.

To enable automatic startup of the automation manager whenever SA z/OS is started, add the start command for the automation manager

```
S procname,SUB=MSTR
```

to the COMMND*xx* PARMLIB member, where *procname* is your selected name of the automation manager start procedure.

You can find a sample startup procedure called INGEAMSA in SINGSAMP. sample library, so that your entry in the COMMND*xx* member could look as follows:

Sample COMMNDxx entry

```
'S INGEAMSA,JOBNAME=HSAM&SYSCLONE.,SUB=MSTR'
```

How to Automate MQSeries Startup

Note: This substep is not necessary when you have decided to use XCF for communication between the automation manager and the automation agents.

When you use MQSeries for manager-agent communication and status backup, you can automate MQSeries and let it be started and stopped by SA z/OS (for details on how this is made possible, see "Exploiting MQSeries V5R3" on page 47).

In a full sysplex environment it is recommended that you start both the local MQSeries manager and its associated DB2 together immediately after JES is up and running. In a single system case with MQSeries version 2.1, DB2 is not needed. See the related product installation manuals for information on how to start MQSeries and DB2 and define these resources to SA z/OS in the customization dialog. For more information, also refer to "Peer Recovery Considerations" on page 51.

Consider that the subsystem RRS is also necessary for shared DB2 database functions.

Step 24: Verify Automatic System Operations Startup

SysOps	ProcOps	I/O Ops
*		

After you have installed the host components of SA z/OS, it is recommended that you perform the following steps for verification purposes:

1. Perform an IPL, if you have not done this according to "Step 22: Check for Required IPL" on page 135. Then start SA z/OS and perform a coldstart. A coldstart is performed by default unless you specify the warmstart option. Do not select the warmstart option, because you might have policy data from earlier releases in your warmstart cache.

   The following messages should appear on the system console:

   ```
   AOF532I hh:mm:ss AUTOMATION ENVIRONMENT HAS BEEN INITIALIZED
   AOF540I hh:mm:ss INITIALIZATION RELATED PROCESSING HAS BEEN COMPLETED
   ```

2. Use the NetView LIST command to confirm that the following SA z/OS tasks are active:

Task Name	Description
AOFTSTS	automation status file task
INGPXDST	XCF communication task

   To confirm that these tasks are active, log on to NetView, and enter the NetView LIST command to display the status for each task:

   ```
   LIST taskname
   ```

3. Use the commands INGAMS and INGLIST to verify that they work.
4. Use the SA z/OS DISPSTAT command in NetView to confirm that subsystem status and automation flag settings are what you expect. Enter the DISPSTAT ALL command to display the status of automated subsystems and automation flag settings: See *IBM Tivoli System Automation for z/OS Operator's Commands* for information about the DISPSTAT command.

5. Use the SA z/OS DISPAUTO command in NetView to display a menu that allows you to initiate further command dialogs. These display information about your automation. Enter DISPAUTO and then choose one of the menu options. See *IBM Tivoli System Automation for z/OS Operator's Commands* for information about the DISPAUTO command.
6. Confirm that the automation shuts down and restarts the subsystems as you expect. You can shutdown and restart each automated resource individually using the following SA z/OS command:

   ```
   INGREQ resource REQ=STOP SCOPE=ONLY RESTART=YES
   ```

   If any of the resources (subsystems) do not restart as you expect, make corrections to your automation policy.

Step 25: Install an SA z/OS Satellite

SysOps	ProcOps	I/O Ops
*		

This step is only required if your enterprise runs one Automation NetView and one Networking NetView with GMFHS on the focal point system or on another focal point NetView. Then you must install SA z/OS on the automation NetView used for system automation.

Step 25A: Customize the Networking NetView or Focal Point NetView Startup Procedure

In SYS1.PROCLIB or another procedure library, find members used to start the Networking NetView application. Insert the data set names from the following table into the indicated DD concatenations.

Notes:

1. The data sets listed in Table 23 should appear last in your concatenation. If they appear before other data sets (for example, data sets containing members customized for automated network operations [AON/MVS]), results are unpredictable.
2. The *ING.SINGMOD1* library needs to be authorized for *APF*.

Table 23. Members to start the Networking NetView

DDNAME	System Operations Data Set
STEPLIB	ING.SINGMOD1
DSICLD	ING.SINGNREX
DSIPARM	ING.SINGNPRM
DSIMSG	ING.SINGNMSG
DSIPRF	ING.SINGNPRF
CNMPNL1	ING.SINGNPNL

Step 25B: Customize the Networking NetView or Focal Point NetView DSIPARM Data Set

Several members in the DSIPARM concatenation must be customized for the SA z/OS satellite. Before editing an SA z/OS member, remember to copy it from ING.SINGNPRM into a new, user-defined data set that is placed before ING.SINGNPRM in the concatenation.

CNMSTYLE

To enable SA z/OS, make sure that the following TOWER statements are activated in CNMSTYLE:

```
TOWER =  SA
TOWER.SA  = SATELLITE
```

AOFMSGST

If you do not choose to use the NetView operator IDs defined by SA z/OS, copy and edit AOFMSGST to contain the appropriate definitions of the synonyms %AOFOPMSU%, %AOFOPHB% for your Networking NetView. %AOFOPMSU% is a synonym for the operators that can be routed commands as a result of alerts trapped in the NetView automation table. %AOFOPHB% is a synonym for the operator that can be routed heartbeat alerts trapped in the NetView automation table. (Note that there can be only one operator defined for %AOFOPHB% and it must be unique and not used for any other functions). Other synonyms in the member are not specific to the Networking NetView environment.

AOFRODM

Copy and edit AOFRODM to contain the correct name for your RODM and a user ID authorized to update it.

- Specify a RODM name by changing RODMNAME=NONE to RODMNAME=xxxxxxxx, where *xxxxxxxx* is your RODM name.
- Specify a user ID by changing RODMUSER=XXAOCFR to RODMUSER=xxxxxxxx, where *xxxxxxxx* is your user ID for batch updates from NetView.

Step 26: Installing and Customizing the NMC Focal Point

SysOps	ProcOps	I/O Ops
*	*	

The SA z/OS topology manager extracts resource topology information from one or more automation managers and maintains corresponding objects within RODM. This information is available if you have completed the previous installation steps. The following sections describe how to customize the SA z/OS topology manager for the operators.

Step 26A: Preparing for NMC

Note:
The first part of this step is performed on the satellite system.

Make sure you have RODM, GMFHS, and MultiSystem Manager installed and working. For information on how to do this, refer to *Tivoli NetView for z/OS*

Resource Object Data Manager and GMFHS Programmer's Guide, *Tivoli NetView for z/OS Graphic Monitor Facility User's Guide* and *Tivoli NetView for z/OS MultiSystem Manager User's Guide*.

Import the sample policy database *NMC, which is delivered with SA z/OS, into your policy database and customize definitions there to fit your environment.

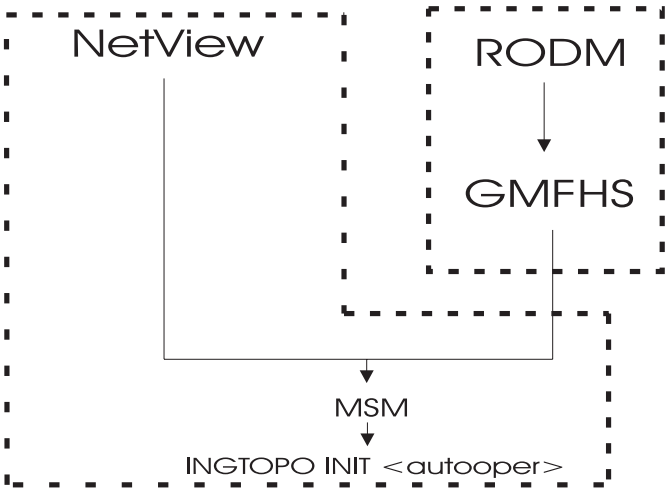


Figure 22. Environment for the SA z/OS Topology Manager

Figure 22 shows the dependencies needed to run the SA z/OS topology manager: NetView and MultiSystem Manager on one hand run in a common address space, RODM and GMFHS on the other hand run in separate address spaces. MultiSystem Manager depends on NetView and on GMFHS. The SA z/OS topology manager depends on MultiSystem Manager.

SA z/OS ships a NetView automation table fragment AOFMSGST that automates this setup. This fragment must be defined in the customization dialog to be loaded on the focal point only. With this table, the SA z/OS topology manager is started after the completion message from MultiSystem Manager.

For additional information, see also the description of CNMSTYLE in "Step 25B: Customize the Networking NetView or Focal Point NetView DSIPARM Data Set" on page 139.

For security considerations, refer to "Securing Focal Point Systems and Target Systems" on page 169.

The RODM name and RODM user must be customized in member AOFRODM on the focal point system (see "Step 25B: Customize the Networking NetView or Focal Point NetView DSIPARM Data Set" on page 139), customizing AOFRODM on any other system is not necessary.

Note
Definition of the Auto Operators is performed for both the satellite and target systems.

Three Auto Operators must be defined in the customization dialog:

- HBOPER (the default is AUTHB)

- POSTOPER (the default is AUTPOST)
- POSTSLV (the default is AUTPOSTS)

Note
POSTSLV: If the task defined on the target systems is different to the task defined on the satellite, then SENDCMD definitions must be defined via the dialogs to provide the mapping.

These Auto Operators must also be defined in DSIOPF or RACF or both.

Note:
The following NetView globals must be set for the target system. They can be set in SINGNPRM(AOFSTYLE).

Two repositories are provided for SA z/OS data:

- The automation manager (for target systems)
- RODM (for the focal point)

AOFUPDAM
Determines whether SA z/OS data should be stored in the automation manager:

YES
SA z/OS data is stored in the automation manager.

NO
SA z/OS data is *not* stored in the automation manager.

AOFUPDRODM
Determines whether SA z/OS data should be stored in RODM:

YES (NMC user)
SA z/OS data is stored in RODM.

NO (non-NMC user)
SA z/OS data is *not* stored in RODM.

AOFSENDALERT
Defines the mechanism that is used to forward data from the target to the focal point. It is only relevant when AOFUPDRODM has been set to YES.

YES
Alerts

NO
Command Handler

Setting the values of AOFUPDAM, AOFUPDRODM and AOFSENDALERT on a Networking NetView or Focal Point NetView is not necessary.

AOFUPDAM, AOFUPDRODM and AOFSENDALERT must be set to the same value on each target system within a sysplex.

AOFUPDAM used in conjunction with AOFUPDRODM will control if and where the SA z/OS data is stored:

AOFUPDAM = 'YES' & AOFUPDRODM = 'YES'
SA z/OS data stored in the automation manager and also in RODM.

Usage: NMC user, any loss of contact between the target systems and the focal point will be followed by the RODM data being rebuilt from the SA z/OS data that had previously been stored in the automation manager, this will ensure no loss of SA z/OS data shown on the NMC.

AOFUPDAM = 'YES' & AOFUPDRODM = 'NO'
SA z/OS data stored in the automation manager only.

Usage: Non-NMC user, it is possible to create a feed from the SA z/OS data held in the automation manager (not used at present, maybe used in future releases of SA z/OS).

AOFUPDAM = 'NO' & AOFUPDRODM = 'YES'
SA z/OS data stored in the RODM only.

Usage: NMC user, no requirement to rebuild the RODM SA z/OS data.

AOFUPDAM = 'NO' & AOFUPDRODM = 'NO'
SA z/OS data not stored in the automation manager or in RODM.

Usage: Non-NMC user.

Step 26B: Modify the NetView DSIPARM Data Set for the SA z/OS Topology Manager

There are a few things you have to do to prepare for the SA z/OS topology manager to run. Table 24 lists the data sets to be modified for this purpose.

Table 24. DSIPARM Members to be modified for the SA z/OS Topology Manager

DSIPARM Member	Description
DSIDMNK	NetView system level parameters for NetView initialization
DSI6INIT	Initialization member for the NetView DSI6DST task.
AOFOPFFP	system operations automation operator definitions
DSICRTTD	NetView CNM router initialization member
DUIFPMEM	NetView focal point definitions
DUIGINIT	GMFHS initialization member
FLCSAINP	MultiSystem Manager initialization member
INGTOPOF	NMC definition member

DSIPARM.DSIDMNK

Notes:

1. This is only necessary if you have chosen to use alert forwarding as your communication method.
2. For NetView 5.1 and above DSIDMNK entries have been moved to CNMSTYLE.

To avoid further changes, alert forwarding `ALERTFWD NV-UNIQ` is recommended. However, any of the following SNA-MDS settings can be defined:

- ALERTFWD SNA-MDS=LOGONLY
- ALERTFWD SNA-MDS=AUTHRCV
- ALERTFWD SNA-MDS=SUPPRESS

While SNA-MDS is not absolutely required, it might be important as it allows the construction of networks with intermediate focal points and hot backups.

If the network contains an intermediate focal point, then ALERTFWD SNA-MDS must be specified in DSIDMNK. If the network does not contain an intermediate focal point, then ALERTFWD NV-UNIQ may be specified in DSIDMNK.

If ALERTFWD SNA-MDS is specified in DSIDMNK, the following entries must be added to sample BNJRESTY:

```
E0 AUTO  SYSTEM AUTOMATION FOR z/OS
E1 DOMN  SYSTEM AUTOMATION FOR z/OS
E2 NET   SYSTEM AUTOMATION FOR z/OS
```

Note: The three values shown above ('E0','E1', and 'E2') are the first three user-defined values. If you already have user-defined entries in BNJRESTY, you may use alternative values for these entries.

For more information on how to add user-defined entries (E0 - EF) to BNJRESTY, refer to the following chapters in *Tivoli NetView for z/OS Customization Guide*:

- Customizing Hardware Monitor Displayed Data
- Using NMVT Support for User-Written Programming
- Adding or Modifying Resource Types

For more information about the ALERTFWD statement, refer to *Tivoli NetView for z/OS Administration Reference*.

DSIPARM.DSI6INIT

This is the initialization member for the NetView DSI6DST task and needs to have the appropriate focal point defined.

```
DEFFOCPT TYPE=ALERT,PRIMARY=NETA.CNM02,BACKUP=NETA.CNM03
```

Note that on the focal point and the backup you will need different members, as NetView complains if a definition references its own system.

Usage of the LU 6.2 alert forwarding mechanism allows for the construction of focal point networks that include intermediate focal points.

Autotask Operator IDs

Each focal point that will be running the SA z/OS topology manager must have an autotask defined for it. Your environment may have one or more of the following types of focal point:

- the primary focal point
- the secondary focal point
- the intermediate focal point (IFP)

This requires a definition in DSIPARM.DSIOPF:

```
 &domain.TPO   OPERATOR    PASSWORD=&domain.TPO
               PROFILEN    AOFPRFAO
```

This definition must be made on the focal point(s) and on each target system. It should only be started as an autotask on the focal point.

An include member, DSIPARM.AOFOPFFP, has been provided to help you centralize and manage these operator IDs. You need to customize it to contain the operator IDs for your focal points.

The &domain. variable contains the focal point's domain ID. This is just a suggestion for the naming scheme.

Note: The names must be unique on the focal point and the target systems.

Additionally, on the focal point, the operator ID must be defined in the DSIPARM.AOFMSGST member, as the value for the %AOFOPTOPOMGR% synonym.

```
SYN %AOFOPTOPOMGR%  = '&domain.TPO';
```

You should not include any backup operators in this synonym.

Installing and customizing needs to be done on the NMC focal point system or on each target system. (This is only for ProcOps.)

It is recommended to use system symbols for the focal point, backup, and intermediate focal point specification. In this case, you can update AOFOPFFP and AOFMSGSY accordingly and make it available in a general data set to all your systems, focal points, and targets. This avoids the same specification of two members on any single system.

You will need one set of autotasks for your primary focal point and a second set for your backup focal point. If you are using intermediate focal points, you will also need a set of operators for each of those (but only on the target systems that are defined to the IFP). Note that even in an IFP situation, the focal point will contact all target systems directly to obtain status and configuration data. The IFP is only used for alert forwarding.

Operator Profiles

This concerns statements in DSIOPF, which associate operator ids with logon profiles and the profiles themselves, which are defined in the DSIPRF concatenation.

Each operator who will be an NMC Administrator must be assigned a NetView logon profile which includes the NGMFADMN=YES key/value pair on its AUTH tag.

Each NMC user who needs to issue commands against resources through the NMC interface needs to be linked to a profile with the NGMFCMDS=YES key/value pair on its AUTH tag.

DSIPARM.DSICRTTD

The focal points need to be identified to your target systems. Uncomment and adapt the following lines for any of your target systems:

```
*  DEFFOCPT PRIMARY=CNM02LUC,TYPE=ALERT,BACKUP=CNM99LUC
*  alerts
*  RMTCMD/XCF
```

DSIPARM.DUIFPMEM

Uncomment and adapt the following 4 statements.

```
*USETCPIP = NO
*TCPANAME = &CNMTCPN
*SOCKETS  = 50
*PORT = 4020
```

Change USETCPIP to YES. Change the PORT number to an unused number in your system if necessary.

DSIPARM.DUIGINIT

Change the domain specification to your focal point domain.

If you use Kanji support check that GMFHS is enabled to send Japanese text to an NMC console for display. In DUIGINIT you have to set JAPANESE=ON.

DSIPARM.FLCSAINP

Copy this member to your user DSIPARM data set and rename it to FLCAINP.

Note: FLCSAINP is obsolete from NetView 5.1. When using NetView 5.1 or above, this step should be bypassed.

DSIPARM.INGTOPOF

Define your sysplex to your NMC as described in "Step 26D: Customize the INGTOPOF File."

Step 26C: Customize RODM

You need to configure RODM so that it will dynamically refresh the workstation when a number of fields other than DisplayResourceStatus is changed. To do this you need to ensure that certain RODM loader statements are processed whenever the GMFHS Data Model is reloaded.

Add the DD statement with member INGDYNRF in the NetView sample procedure EKGLOADP.

```
   .
   .
   .
//*EKGIN1   DD DSN=&EKGIN1,DISP=SHR
//EKGIN1 DD DSN=&SQ1..V&NETVER..CNMSAMP(DUIFSTRC),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM1),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM2),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM3),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM4),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM5),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM6),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM7),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM8),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDM9),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDMA),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDMB),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDMC),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDMD),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDME),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDMF),DISP=SHR
//         DD DSN=&SQ1..V&NETVER..CNMSAMP(FLBTRDMZ),DISP=SHR
//*  Dynamic update of resources
//     DD DSN=&SQ2..V&SAMVER..SINGSAMP(INGDYNRF),DISP=SHR
//*
//*
   .
   .
   .
```

Figure 23. Sample of RODM Load Procedure EKGLOADP

Step 26D: Customize the INGTOPOF File

The generic name for the topology control file is "INGTOPOF". Local versions of the INGTOPOF file may also be created.

The naming (format) of the local versions will be "TPF" concatenated with the domain name of the focal point. For example, if the focal point has a domain name of "IPSNM", then the local INGTOPOF name will be "TPFIPSNM".

Multiple INGTOPOF files (generic and local) may exist with a single DSIPARM. This will provide the flexibility to tailor each INGTOPOF to suit the requirements of each focal point.

When the topology manager attempts to read the topology control file, in the first instance it will look for the local INGTOPOF member name within DSIPARM. Processing is as follows:

1. If the local INGTOPOF member exists within DSIPARM, then the content of that member will be used by the topology manager.
2. If the local INGTOPOF member does not exist within DSIPARM, then the topology manager will attempt to read the INGTOPOF member within DSIPARM.
3. If the INGTOPOF member exists within DSIPARM, then the content of that member will be used by the topology manager.
4. If the INGTOPOF member does not exist within DSIPARM, then the topology manager will terminate with RC = 9.

The following overview of the operation mode of the SA z/OS topology manager supplies some background for discussing the INGTOPOF file. Some familiarity with the class structure of RODM and with the BLDVIEWS tool is assumed.

During initialization, the SA z/OS topology manager gathers information about generated SA z/OS resources from the sysplex and stores the resources within RODM, prefixing their names with the current sysplex name. Usually not only the resources, but also the dependencies and major/minor relationships between resources will be represented in RODM (this depends on the OPTION statement in the INGTOPOF file, see Appendix B, "Syntax for INGTOPOF File," on page 189).

The INGTOPOF file supplies the SA z/OS topology manager with the following information:

- which sysplexes there are and which of their member systems contain a SA z/OS topology agent.
- the names of the data sets (members) that contain the definitions of the views.
- when views must be rebuilt during runtime, it is desirable that only those views be rebuilt to which new members have been added.

You will need to prepare the INGTOPOF input file. This contains information about the target domains and how they are grouped into sysplexes along with some additional information that affects the resources that are dynamically created.

The INGTOPOF file contains configuration information for the SA z/OS topology manager. It must reside in DSIPARM. The records of the file consist of a keyword with one or more parameters. Comment lines must have an asterisk (*) in the first column. A '+' at the end of a line indicates that the record is continued in the next line.

The information is passed from the INGTOPOF file to the SA z/OS topology manager with the help of the following keywords:

- SYSPLEX
- PROCOPS

- BLDVIEWS
- [LOCATION]
- [ANCHOR]
- [OPTION]
- [TEMPLATE]
- [MAPCOLOR]

The syntax of the statements in the INGTOPOF file is described in Appendix B, "Syntax for INGTOPOF File," on page 189.

A sample of INGTOPOF is provided in the SINGNPRM library.

To start the MultiSystem Manager and load the INGTOPOF file, use the MultiSystem Manager start command FLCAINIT.

Step 26E: Prepare BLDVIEWS Cards

You need to provide files with BLDVIEWS cards. These are required for the SA z/OS resources to appear on the NMC workstation. These files will become part of the BLDVIEWS statement in the INGTOPOF file. The BLDVIEWS statement in the INGTOPOF file is used by the SA z/OS topology manager to pass information to the BLDVIEWS tool which it invokes to produce the views of the objects. The BLDVIEWS tool writes information about views into RODM. The SA z/OS topology manager is automatically invoked whenever you start SA z/OS or you can invoke it with the INGTOPO command whenever you changed information in the INGTOPOF file or in the files with the BLDVIEWS cards.

To run the BLDVIEWS tool, use one of the following methods:

- via the SA z/OS topology manager which invokes the tool
- via an external invocation of this tool (as a NetView command in a NetView session)

For information about the BLDVIEWS cards syntax refer to the appropriate NetView documentation.

The following three SA z/OS BLDVIEW samples are provided in the SINGNPRM library matching the INGTOPOF sample file:

- INGBVIEW (sample view for SysOps objects)
- INGPVIEW (sample view for ProcOps objects)
- INGCVIEW (sample view for common objects)

Note: To start MultiSystem Manager and load the INGTOPOF file, use the MultiSystem Manager start command: `FLCAINIT`

Step 27: Copy and Update Sample Exits

SysOps	ProcOps	I/O Ops
*	*	*

Several sample exits are provided in the SINGSAMP library (for example, AOFEXSTA). You can use these samples to create your own exits. When used, they must be copied into a data set (either the enterprise-specific or domain-specific) in

the DSICLD concatenation. These exits are called at fixed points during SA z/OS processing. Therefore, you should look into each of the sample exits to determine whether you need to use and update it.

Updating and copying the sample exits allows you to add your specific processing. For more information on user exits, provided samples and advanced automation options, refer to *IBM Tivoli System Automation for z/OS Customizing and Programming*.

Step 28: Install CICS Automation in CICS

SysOps	ProcOps	I/O Ops
*		

This section describes the basic CICS Automation definitions that take place on CICS. Refer to the CICS documentation while performing these steps, especially the *CICS Resource Definition Guide*. These steps are performed on each CICS region.

Note: The TS queues EVEVCQUE and COLEEVEQ used by SA z/OS CICS must not be defined as remote in your TST (temporary storage table).

Step 28A: SIT or Startup Overrides

On each CICS, ensure that the system initialization table (SIT) or startup overrides include the following:

```
PLTPI=xx,             where xx is the suffix to the startup PLT
PLTSD=yy,             where yy is the suffix to the shutdown PLT
MSGLVL=1,
BMS=(STANDARD|FULL)
```

Because CICS Automation maintains a long-running task in each CICS, review the AMXT, CMXT, and MXT values.

You may optionally add CN as your last startup override, whether from SYSIN or through the JCL. However, this is not necessary if you have added the &EHKVAR1 variable to the PARM of the CICS start command in the STARTUP item of the APPLICATION policy object. The following is an example:

```
MVS S cics,...,PARM='SYSIN,START=xxxx&EHKVAR1'
```

This is also the way the start commands are predefined in the sample databases.

Step 28B: Program List Table Definitions

Add the TYPE=ENTRY definitions shown in the following example to the post initialization program list table (PLT) for each CICS after the entry for DFHDELIM (as in phase 2).

```
DFHPLT TYPE=INITIAL,SUFFIX=xx
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
DFHPLT TYPE=ENTRY,PROGRAM=EVEPYINI
DFHPLT TYPE=ENTRY,PROGRAM=EVESTISP
DFHPLT TYPE=FINAL
```

Add the TYPE=ENTRY definitions shown in the following example to the shut down program list table (PLT) for each CICS.

```
DFHPLT TYPE=INITIAL,SUFFIX=yy
DFHPLT TYPE=ENTRY,PROGRAM=EVESPLTT
DFHPLT TYPE=ENTRY,PROGRAM=EVESYLMQ
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
DFHPLT TYPE=FINAL
```

Assemble the PLT tables.

If you must define a new table, add the following definitions to the CSD:

```
DEFINE PROGRAM(DFHPLTxx) LANGUAGE(ASSEMBLER) GROUP(yourgroup)
DEFINE PROGRAM(DFHPLTyy) LANGUAGE(ASSEMBLER) GROUP(yourgroup)
```

Step 28C: Define Consoles

CICS Automation uses EMCS consoles to issue Modify CICS commands when managing CICS. Console definitions are required for correct CICS Automation operation.

Define consoles for autotasks to enable CICS Automation functions. This step can be skipped if you enable CICS Auto-Installed Consoles. This can be achieved by specifying "AICONS=YES" in the CICS system initialization parameters.

In an EMCS environment the autotask console names are determined, in order of precedence as follows:

1. If you are using AOCGETCN (that is, using the profiles shipped with the product) the name is determined by AOFCNMASK. For more information, see *IBM Tivoli System Automation for z/OS Customizing and Programming* or *IBM Tivoli System Automation for z/OS Defining Automation Policy*.
2. The CONSNAME parameter on the PROFILE statement in the task profile determines the EMCS console name. For more information, see *Tivoli NetView for OS/390 Administration Reference* and *Tivoli NetView for OS/390 Security Reference*.
3. By default the autotask name is used for the EMCS console name.

A console has to be defined for each SA z/OS work operator. These are typically named "AUTWRK*xx*"

In addition, a console has to be defined for each NetView operator that may wish to inquire or control a CICS region.

This can be simplified by specification of the CICS Console Auto-install function for CICS Transaction Server V1.3 and later releases. Further information on this function can be found in the CICS Installation/Customization manuals.

For pre-Transaction Server V1.3 CICS systems, the following two PTFs provide a mechanism to define a pool of consoles: PQ09813 for CICS TS V1R1 and V1R2.

Step 28D: Transaction and Program Definitions

This step describes how to define the standard CICS Automation transactions and programs to CICS. To this purpose, the DFHCSDUP program is used.

The members required to run these jobs are provided with CICS Automation. However, some modifications are required, as described below:

Hint
You might want to back up your CSDs before doing this step.

For each CSD, run the EVESJ015 sample job. This job defines transactions and programs for CICS automation in three groups:

- EVEGRP1
- EVEGRP2
- EVEGRP3

Before you run it, modify the job as directed in the JCL comments. The definitions must be updated for every CICS CSD file that has CICS subsystems that are to be controlled by SA z/OS. If there are existing CSD definitions for older releases of SA z/OS, run the sample job for this release to upgrade the definitions to the latest release. The definitions are downwards compatible to previous releases.

Step 28E: DFHRPL and the CICS Automation Library

Update the DFHRPL concatenation to add the library ING.SINGMOD1 for every CICS subsystem that is to be managed by SA z/OS. Do ***not*** add these libraries to the DFHRPL for CICSPlex CMAS subsystems.

Step 29: Install IMS Automation in IMS

SysOps	ProcOps	I/O Ops
*		

Step 29A: Modify and Run the IMS SYSGEN

DBCTL regions do not require IMS SYSGEN information. Therefore this step can be omitted.

1. Add the statements in ING.SINGSAMP member EVISI002 into your IMS GEN for each IMS.
2. Make sure that the APPLID parameter on the COMM macro in the GEN contains the appropriate applID. The APPLID parameter on the COMM macro for IMS must be specified. This parameter must match the one specified in the APPLID parameter statement in the policy database, when defining a particular IMS control region. If the APPLID is left to default in the IMS GEN, the MVS jobstep name will be used for the APPLID name for this IMS, thus causing the IMS Automation PPI to fail to initialize. A mismatch will occur at initialization time.
3. Perform a GEN for each IMS.

Step 29B: Define IMS PSB Entries

1. Merge the statements in ING.SINGSAMP member EVISI001 with your existing PSB gen for each IMS.
2. Run the PSB and ACB gens for each IMS.

Note: The output of the ACBGEN utility for the PSB ″name″ will indicate how much space is required in the CSA PSB pool.

Step 29C: Define IMS Security Gen Entries

Add the statements in ING.SINGSAMP member EVISI003 to your security maintenance utility input and run a security gen for each IMS, or code them as shown below. This will give transaction EVITPPII access to all commands.

```
)( CTRANS   EVITPPI1    /* GENERATE TRANSACTION SECURITY */
   TCOMMAND *           /* ALL COMMANDS */
```

For users of IMS Version 6 or above, any NetView operator that issues 'Display Shutdown Status' (option 1.4 of the SA z/OS IMS operator command dialogs) must have their NetView terminal authorized to issue IMS display commands, otherwise an IMS DFS093 error message will be issued. The Display Shutdown Status facility is not supported for IMS versions below version 6.

If you plan to use the Display Shutdown Status facility to display shutdown status information for IMS systems running on remote domains, then you should review the entries in the SEND COMMAND OPERS policy item of the ENTERPRISE object (see *IBM Tivoli System Automation for z/OS Defining Automation Policy*). This is because NetView command RMTCMD is used to route the necessary IMS display status commands to remote domains. RMTCMD runs on the remote domain using the current userID on the local domain unless this userID is modified using the SEND COMMAND OPERS policy item.

Note: Security checks will be performed in NetView before IMS Automation is invoked.

Step 29D (Optional): Define IMS BMP Procedure

The BMP handles commands from NetView via the program-to-program interface. The BMP is initialized as a started procedure requested by SA z/OS via a normal subsystem definition. Its usage is optional, but it is required if the EVISNCCI command is used in NetView to execute commands in an IMS Control Region. To customize the BMP, perform the following steps:

1. Copy the SINGSAMP member EVISI004 to your user PROCLIB and tailor it according to the instructions in the JCL comments.
2. Tailor the SINGSAMP member EVISJ002 and run it to build a copy of the module for the SA z/OS EVIRYPPI Rexx module.
3. See *IBM Tivoli System Automation for z/OS IMS Automation Programmer's Reference and Operator's Guide* for further customization details.

Step 29E: Specify Required Control Region Parameters

Modify all IMS Control region and IMS DB control region JCL to specify the following parameter:

CMDMCS=Y
This is required for correct operation of IMS product automation.

PREMSG=N
This is required for correct operation of IMS Product Automation.

Step 29F: Install DFSAOE00 Exit

There are three ways to install the exit.

- Use the default z/OS exit router as supplied by SA z/OS.
  - This involves concatenating the ING.SINGMOD1 library before the IMS.SDFSRESL library after the IMS.SDFSREL library in the STEPLIB concatenation.

  - Add PROG*xx* members to SYS1.PARMLIB to define the exit. Sample member EVISI005 contains the base required definitions. See *IBM Tivoli System Automation for z/OS IMS Automation Programmer's Reference and Operator's Guide* for further customization details.
- Use the SA z/OS-supplied exit on its own.
  - This involves concatenating the ING.SINGMOD1 library after the IMS.SDFSREL library in the STEPLIB concatenation, unless ING.SINGMOD1 is in the linklist concatenation chain.
  - Relink the EVIPVEX1 module and give it an ALIAS of DFSAOE00 into a library concatenated before IMS.SDFSRESL in the STEPLIB concatenation. Sample EVISJ001 is an example of how to do this.
- Call the SA z/OS exit from your routine.
  - This involves concatenating the ING.SINGMOD1 library after the IMS.SDFSREL library in the STEPLIB concatenation, unless ING.SINGMOD1 is in the linklist concatenation chain.
  - Call the EVIPVEX1 module from your exit program as detailed in *IBM Tivoli System Automation for z/OS IMS Automation Programmer's Reference and Operator's Guide*.

Step 30: Install TWS Automation in TWS

SysOps	ProcOps	I/O Ops
*		

Step 30A: Add Libraries to TWS/TWS

Add your SINGMOD1 library and the NetView CNMLINK library containing CNMNETV to the TWS steplib. Alternately, you may add these libraries to LINKLST. You should have already APF authorized these libraries.

Step 30B: Update TWS/TWS Parameters and Exits

A recycle of TWS is required for installing the exit 7 module EQQUX007 or the exit 11 module EQQUX011. If you are using an existing exit 7 or exit 11, you can combine these exits with TWS Automation-supplied modules.

TWS Automation supplies EQQUX007 to detect workstations used for NetView communication. The following modules are used as part of that process:

```
EQQUX007
UX007001
UX007004
EQQUX011
UX011011
```

EQQUX007 and EQQUX011 are the exit driver programs. They call other modules in turn, as if TWS is calling each module directly.

The EQQUX007 driver searches for UX007001 through UX007010 and the EQQUX011 driver searches for UX011001 through UX011010. UX007001, UX007004, and UX011001 are supplied with TWS Automation.

If you have an existing exit 7, rename your module from EQQUX007 to UX007005. If you have an existing exit 11, rename your module from EQQUX011 to UX011002.

The called routines are passed the same parameters the call to EQQUX007 or EQQUX011.

If you wish to add additional exit 7 or exit 11 modules, then use the next available name, such as UX007005 or UX011002. This makes it easier to integrate exits that are supplied by various products. Also, because modules are loaded dynamically by the exit driver on each invocation, you may add, delete, or modify an exit module without recycling TWS.

You must specify the CALL07(YES) parameter in the TWS/ESA initialization parameters.

You must specify the CALL11(YES) parameter in the OPC/ESA initialization parameters if you wish to monitor CP deletes. CP delete monitoring allows TWS Product Automation to clear outstanding SDF and NMC alerts when an application or operation is deleted from the current plan.

Other initialization parameters must be specified in the TWS initialization member (EQQPARM) so that TWS will issue some of its messages to the MVS console.

The DURATION, ERROROPER, LATEOPER, and OPCERROR messages are automated by TWS Automation. The RESCONT and QLIMEXCEED messages are useful for further customer automation.

You must specify the following in EQQPARM:

```
ALERTS WTO (DURATION
   ERROROPER
   LATEOPER
   RESCONT
   OPCERROR
   QLIMEXCEED)
```

In addition, you must edit the TWS-supplied message members for certain messages.

The following messages are automated and may require changes to the TWS or TWS supplied message members in the SEQQMSG0 data set:

Message	Member
EQQW065I	EQQW06
EQQW011I	EQQW01
EQQN013I	EQQN01
EQQZ086I	EQQZ08
EQQE026I	EQQE02
EQQE036I	EQQE03
EQQZ128I	EQQZ12
EQQZ201I	EQQZ20

Modify these message members to include WTO=YES for the indicated message IDs. Full details for customizing TWS can be found in *Tivoli Workload Scheduler for z/OS Customization and Tuning*.

Note:

If you use NMC and SDF to monitor the status of TWS operations, you should enable UX007004 and update INGMSGU1 to remove the Message

Automation Traps traps for EQQE026I and EQQE036I. This is to prevent you from getting multiple NMC and SDF alerts for the same TWS event as a result of the following:

- NMC and SDF alerts that are generated from EQQE036I do not contain an operation number. Therefore, if an application contains operations that have identical jobnames (with the same IATIME and same workstation ID), it is possible that duplicate or ambiguous alerts are generated.
- Alerts that are generated from EQQE026I and EQQE036I are not removed from NMC and SDF if UX007004 is not active. This is because TWS does not issue a message when these operations exit error status.

Step 31: Install USS Automation

SysOps	ProcOps	I/O Ops
*		

Step 31A: Define UNIX Segments (OMVS)

Depending on the operator security definition of NetView, one or more UNIX segments must be defined. These OMVS segments can have a root UID (0) or a non-root UID. To run non-root requires more setup.

When using OPERSEC=MINIMAL, NETVPW, or SAFPW, one OMVS segment must be defined. This is the segment for the user ID running NetView.

When using OPERSEC=SAFCHECK, or SAFDEF (user level security), the following operator IDs need a UNIX segment:

- AUTWRK01-NN
- RPCOPER
- MONOPER
- AUTRPC
- AUTO1
- AUTSYS (backup task for AUTRPC and AUTO1)
- AUTBASE (backup task for AUTRPC and AUTO1)
- all tasks receiving actions from the AT for UNIX resources, usually these are the work operators

Using the OMVS Segment with Root UID

This is the easiest way for setting up the z/OS UNIX segment. To give it a UID of 0 (root user), enables this user to operate without restrictions. This segment must also be permitted to the RACF facility class BPX.DAEMON (if defined).

Note: Each user who can change NetView CGlobals may be able to issue UNIX System Services commands under a root user ID.

Using the OMVS Segment with Non-Root UID

If you want to reduce the number of UID 0 users, it is possible to define a setup without UID 0 with some restrictions.

If you are using a setup with non-root UID, the OMVS segment must be defined in the following way:

Monitoring:

- For process monitoring:

  Define read access to SUPERUSER.PROCESS.GETPSENT

  This allows a user ID to see all processes. If the user ID performing the monitoring is not allowed to check all processes, the automation may assume that the start was not successful and restarts the application. This will result in many instances.
- For file or filesystem monitoring:

  Define read access to SUPERUSER.FILESYS

  This allows a user ID to get access to all files in the UNIX file system. If the user ID performing the monitoring is not allowed to check all files, the automation may assume that the resource is unavailable.
- Give access to any resource that user-written monitoring routines may use
- For user-defined monitoring, see "Command Execution (INGUSS)" below. (User defined monitoring is performed with the command INGUSS.)

Command Execution (INGUSS):

- Give the OMVS segment the ability to switch to any user ID associated with z/OS UNIX resources (access to BPX.SRV.userid or BPX.SUPERUSER to start root programs).
- Depending on your security environment the OMVS segment may need access to BPX.DAEMON.
- The OMVS segment must be authorized to perform all the commands that are specified in the customization dialogs. For an overview of authorizations for non-root users, refer to the chapter that explains UNIXPRIV class profiles in *z/OS UNIX System Services Planning*.

Restrictions for Non-Root UID Setup: There is an MVS identity and an z/OS UNIX identity. Without a UID 0 you cannot switch the MVS identity. If a user needs access to certain MVS data sets, you may not start the application with INGUSS. You may have trouble when automating z/OS UNIX resources that require a UID of 0 (for example, the inetd). The OMVS segments without UID 0 are normally not able to switch to a root user in order to perform actions. SA z/OS standard monitoring will work. For example, if you allow the OMVS segment to switch to UID 0 (by defining read access to BPX.SUPERUSER), you could also assign it a UID of 0.

Creating an OMVS Segment by Submitting a Job

Creating OMVS segments can be done by submitting a job, as shown in Figure 24 on page 156.

The NOPASSWORD option prevents unauthorized logins.

This OMVS segment must be authorized to set the jobname (read access to BPX.JOBNAME). Otherwise, the started address spaces have the same jobname as NetView. When the jobname can be set, the newly created address space has the jobname INGCUNIX.

If the started UNIX processes are to have a user-defined MVS jobname (specified with the JOBNAME parameter of the INGUSS command), the target user IDs that are issuing the commands must have at least read access to RACF facility class BPX.JOBNAME. Otherwise, a jobname will be assigned by the operating system. The target user ID is the user that this resource is assigned to in the customization dialog panel, z/OS UNIX Control Specification.

```
//*
//ADDUSER  EXEC PGM=IKJEFT01
//*
//SYSTSPRT DD SYSOUT=*
//SYSLBC   DD  DSN=SYS1.BRODCAST,DISP=SHR
//SYSTSIN  DD *
  ADDUSER STCUSER +
          NOPASSWORD+
          UACC(NONE) DFLTGRP(AUTGRP) +
          OMVS(UID(0000000) HOME('/')  PROGRAM('/bin/sh')) +
//*
//COUSERS  EXEC PGM=IKJEFT01
//*
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD *
  CO      STCUSER GROUP(USERS) AUTH(USE)
//*
```

Figure 24. Job Example of Creating an OMVS Segment

Step 31B: Preparing for USS Automation

Use the common global variable, AOFUSSWAIT, that you can set in your startup exit, to change the way SA z/OS behaves. This variable should be set only once for an SA z/OS system.

AOFUSSWAIT is the time that SA z/OS waits for the completion of a user-specified z/OS UNIX monitoring routine (defined in the z/OS UNIX Control Specification panel) until it gets a timeout. When the timeout occurs, SA z/OS does no longer wait for a response from the monitoring routine and sends a SIGKILL to the monitoring routine.

Step 32: Customizing GDPS

SysOps	ProcOps	I/O Ops
*		

This section describes the necessary customization and definitions when running GDPS on top of SA z/OS.

Step 32A: Preparing NetView

1. Concatenate the SGDPPARM product data set to the DSIPARM DD-statement in the Netview startup procedure. See the SA z/OS provided sample INGENVSA in the SINGSAMP library for more details.
2. If you need to modify the INGXINIT member, which is the initialization member of the SA z/OS communication task for the production system or its equivalent INGXKSYS, which is for the GDPS controlling system, copy them to user data sets and make your modifications there.
3. Copy the INGSTGEN member from the sample library (SINGSAMP) to the CNMSTGEN member of the DSIPARM data set of each NetView instance in your sysplex and modify the TOWER statements saying:

   ```
   TOWER.SA  = SYSOPS GDPS
   TOWER.SA.GDPS = PPRC
   ```

Additionally, specify whether or not this is the GDPS controlling system (KSYS) or the production system (PROD) by removing the asterisk in front of these lines:

```
*TOWER.SA.GDPS = PPRC KSYS
*TOWER.SA.GDPS = PPRC PROD
```

Step 32B: Preparing the Automation Manager

The GDPS controlling system must run in a separate XCF group (subplex) and therefore has its own automation manager. The sample automation manager PARMLIB member for the K-system is HSAPRMKS using GRPID of "KS". The default automation manager PARMLIB member for the production systems is HSAPRM00. Consult the members and make the necessary changes.

Copy and edit the automation manager startup procedure INGEAMSA. The same startup procedure can be used for the automation manager that controls the production systems and the automation manager that controls the K-system, assuming that the PARMLIB member suffix is specified on invocation of the procedure.

Step 32C: Defining the Automation Table Used by GDPS

SA z/OS provides automation table INGMSGGP that contains all messages required by GDPS depending on the specified GDPS Tower statement. Add the INGMSGGP automation table in the system policy so that the table is automatically loaded by SA z/OS at initialization time.

Chapter 10. Installing SA z/OS on Workstations

This chapter contains information on how to install those parts of SA z/OS that are required on workstations:

- "Installing the NMC Workstation"
- "Installing and Customizing the TEC Event Server Workstation" on page 165

The workstation components can be installed on any workstation that meets the requirements listed in Chapter 1, "SA z/OS Prerequisites and Supported Equipment," on page 3. One or more workstations can be installed for users to monitor and control the systems being managed with SA z/OS.

The code for the SA z/OS NMC exploitation is supplied with the host code that is installed using SMP/E. Installing the SA z/OS NMC exploitation will enable you to issue the most important SA z/OS processor operations and system operations commands from all NMC workstations.

Note: The NMC installation as described in "Installing the NMC Workstation" is performed on the NMC Server and the NMC clients. After this installation, you need to restart the individual NMC clients.

Installing the NMC Workstation

If you already have an NMC environment installed, you can continue with the actions described in the remainder of this section. Having completed these, you can use the SA z/OS NMC exploitation as described in *IBM Tivoli System Automation for z/OS User's Guide*. This will enable you to issue a selection of SA z/OS processor operations and system operations commands from all NMC workstations.

The following packed files for the SA z/OS NMC exploitation are available after your SMP/E installation:

- ING.SINGPWS1(INGNMCZP): packed file for Windows; download this file with extension ZIP and unpack with an appropriate tool (WINZIP or PKZIP).
- ING.SINGPWS1(INGNMCTZ): packed file for UNIX Workstations; download this file with extension TAR.Z and unpack and uncompress with an appropriate tool (*uncompress* and *tar*).
- ING.SINGPWS1(INGNMCZJ): Japanese version of the packed file for Windows workstations; If you use the Japanese version of SA z/OS download this file with extension ZIP and unpack with an appropriate tool (WINZIP or PKZIP).
- ING.SINGPWS1(INGNMCTJ): Japanese version of the packed file for UNIX workstations; If you use the Japanese version of SA z/OS download this file with extension TAR.Z and unpack and uncompress with an appropriate tool (*uncompress* and *tar*).

The content of each packed file is divided into a support for system operations commands and a support for processor operations commands. Both packages include two NMC response files. One response file contains the system operations commands, the other one contains the processor operations commands. The response files include the definitions and profiles for

ING_SO_OPER
SystemOperation Operator

ING_PO_OPER
ProcessorOperation Operator

ING_SA_OPER
SystemAutomation Operator (definition for both the system operations and processor operations commands)

Furthermore there are two subdirectories for the related data definition files and two subdirectories with the online help in HTML format.

With this separation of system operations and processor operations commands you may install either the system operations commands or the processor operations commands or both depending on your needs. The installation has to be done manually, as there is no common installation tool for the several supported platforms. This requires that you are familiar with the common commands of your workstation operating system.

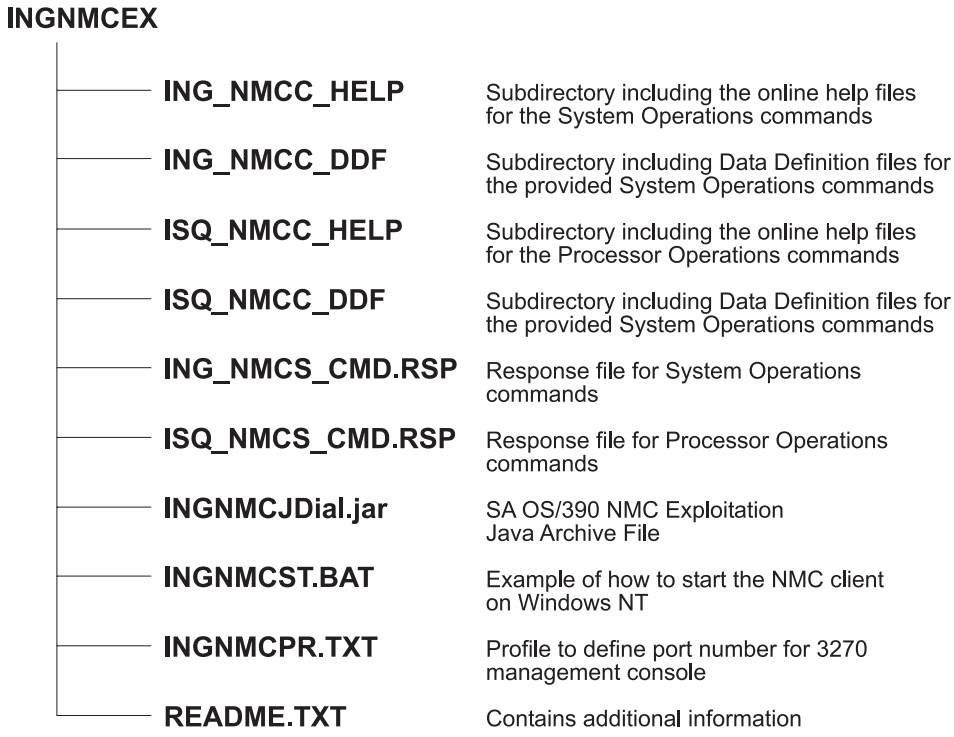


Figure 25. Directory Structure of Unpacked Files

Installation Steps on the NMC Server

Perform the following steps to install SA z/OS NMC exploitation on the NMC Server (it should be noted, the term UNIX in the following steps refers to all forms of UNIX derivatives, including AIX, z/Linux, etc.):

1. Download the appropriate packed file in binary format to the NMC Server.

2. Unpack the file into a temporary directory of the NMC Server, using an appropriate tool for the NMC Server operating system. You will obtain the directory structure for the unpacked files as shown in Figure 25 on page 160.
3. Copy the required help files as follows:

Environment	From Directory	To Your Directory
WIN	*tmp*\INGNMCEX\ING_NMCC_HELP and/or *tmp*\INGNMCEX\ISQ_NMCC_HELP	[BINDIR]\TDS\server\db\current\help
UNIX	*tmp*/INGNMCEX/ING_NMCC_HELP and/or *tmp*/INGNMCEX/ISQ_NMCC_HELP	$BINDIR/TDS/server/db/current/help

where *tmp* stands for the directory where you downloaded the files.

Note: ***BINDIR*** is an environment variable set by your NMC installation and indicates that this is a subdirectory of your installed NMC product. For example:

```
usr\local\Tivoli\bin\w32-ix86\
```

4. Copy the required data definition files as follows:

Environment	From Directory	To Your Directory
WIN	*tmp*\INGNMCEX\ING_NMCC_DDF and/or *tmp*\INGNMCEX\ISQ_NMCC_DDF	[BINDIR]\TDS\server\config\ddf\c
UNIX	*tmp*/INGNMCEX/ING_NMCC_DDF and/or *tmp*/INGNMCEX/ISQ_NMCC_DDF	$BINDIR/TDS/server/config/ddf/c

5. Copy the required response files from INGNMCEX as follows:

Environment	To Your Directory
WIN	[BINDIR]\TDS\server\sample
UNIX	$BINDIR/TDS/server/sample

6. Copy the Java™ archive file INGNMCJDial.jar from INGNMCEX as follows:

Environment	From Directory	To Your Directory
WIN	*tmp*\INGNMCEX	[BINDIR]\TDS\server\db\current\lib
UNIX	*tmp*/INGNMCEX	$BINDIR/TDS/server/db/current/lib

7. Verify the following:
   a. To operate the NMC Server you must be logged on to NetView via a 3270 host session.
   b. Your NetView user ID must have NGMF administrator rights.
   c. The NMC Server must be started and active.
   d. The connection from the NMC Server to NetView must be established.
8. Start the *Command Profile Editor batch utility* (CPEBATCH) with:
   a. for WIN environment
      - [BINDIR]\TDS\server\sample\ING_NMCS_CMD.RSP and/or
      - [BINDIR]\TDS\server\sample\ISQ_NMCS_CMD.RSP

and the -i and -g parameters

b. for UNIX environment
   - `$BINDIR/TDS/server/sample/ING_NMCS_CMD.RSP` and/or
   - `$BINDIR/TDS/server/sample/ISQ_NMCS_CMD.RSP`

   and the -i and -g parameters

With this step, you load the delivered commands into the NetView internal database. For information on how to use this batch utility, refer to *NetView Management Console User's Guide*. For a detailed description of how to maintain and manipulate response files for the NMC topology server, go to the SA z/OS Web page at http://www.ibm.com/servers/eserver/zseries/software/sa/adds/hint03.html.

9. Use the Command Profile Editor batch utility (CPEBATCH) to apply the new profiles installed with step 8 to the individual operators defined in your installation. Just these operators that are linked to one of the SA profiles can execute SA commands. All other operators cannot display or execute SA commands.

   For more details on CPEBATCH refer to the appendix 'Topology Server Commands' in the manual *Tivoli NetView for z/OS: NetView Management Console User's Guide*.

   Notes:

   a. The NetView CPE online utility was retired with NetView 5.1. Customers running NetView 1.4 can still use the CPE online utility to modify the definitions. The CPE online utility was never available for UNIX installations.

   b. The recommended way to maintain definitions like operators, profiles, etc. is to use the tool delivered in the INGRSPTOOL.ZIP file. The tool comes with a detailed description. It can be downloaded from the SA z/OS home page at http://www.ibm.com/servers/eserver/zseries/software/sa/adds/hint03.html.

Installation Steps on the NMC Client

You must have the ***NetView 3270 Management Console*** installed if you want to use full screen commands. Refer to the *NetView Management Console User's Guide* for information on how to do this.

Note: You cannot use full screen commands when the NMC focal point is a satellite installation. Use line mode commands instead. More details can be found in the ingnmcex/readme.txt mentioned above.

1. Set the environment variable TCONSOLE_CLASSPATH:

   a. for WIN environments pointing to:
   ```
   [NMC_Client_Installation_path]\TDS\client\lib\INGNMCJDial.jar
   ```

   b. for UNIX environments pointing to:
   ```
   [NMC_Client_Installation_path]/TDS/client/lib/INGNMCJDial.jar
   ```

   Refer to Figure 26 on page 164 for a sample batch file.

2. On the individual NMC Clients: Restart your NetView Management Console to incorporate your changes.
3. Customize the NetView 3270 Management Console. Execute these steps only if you use full screen commands:

a. On the NMC, select an SA z/OS resource from an existing view. For this resource, select an SA z/OS command that needs to be transferred to the NetView 3270 Management Console, for example, the INGVOTE_FS command. Click on INGVOTE_FS to display the NetView 3270 Management Console, that does not show any output yet.
b. Select ***Session Services*** from the NMC menu bar, and choose ***Add/Delete/Modify Session*** from the menu items. This opens the ***Add/Delete/Modify Session*** window.
c. In the ***Full Screen Session Name*** field of this window type: `SA`
d. In the ***Start command String*** field type, for example: `window date`
   (You can enter any valid NetView command.)
e. Select the radio button ***Immediate***
f. From the ***Session Options*** select: ***Start Automatically***
g. Press the ***Add*** push button, then the ***Save*** push button to save your changes
h. Press the ***Done*** push button to exit this window
i. In the NMC, select the added *SA* pull-down choice from the ***Session Services*** menu bar item
j. To verify the customization, issue the INGVOTE_FS command to display the desired output

Sample to Start the NMC (for Windows NT Environment)

```
@rem ********************************************************************************
@rem IBM System Automation for z/OS NetView Management Console Exploitation
@rem Sample Program - 5645-006
@rem               (C) Copyright IBM Corp. 2004
@rem                    All rights reserved.
@rem
@rem SAMPLE PROGRAM - NO WARRANTY EXPRESSED OR IMPLIED
@rem
@rem You are hereby licensed to use, reproduce, and distribute these sample
@rem programs as your needs require.  IBM does not warrant the suitability or
@rem integrity of these sample programs and accepts no responsibility for their
@rem use for your applications.  If you choose to copy and redistribute
@rem significant portions of these sample programs, you should preface such
@rem copies with this copyright notice.
@rem ********************************************************************************
@rem
@rem PRODUCT          (System Automation for z/OS)
@rem COMPONENT        (NMC Exploitation)
@rem FIRST_RELEASE    (V2R1)
@rem LAST_CHANGE      (11Jan2002)
@rem
@rem MODULE_NAME      (ingnmcst.bat)
@rem DESCRIPTIVE_NAME (Start the NMC Topology Console)
@rem ********************************************************************************
@rem
@rem Function:  This sample shows how the NMC Topology Console can be
@rem            started. This sample was written for the Windows NT environment
@rem            and NMC 1.3.0.1.
@rem
@rem Usage:
@rem
@rem - The following is a sample which will NOT properly work until customer
@rem   installation specific data is provided.
@rem
@rem - Adapt the drive and path statements to reflect your installation
@rem   environment.
@rem   This example assumes that the NMC Topology Console was installed on
@rem   drive E:.
@rem
@rem - A good location to put this file is the directory:
@rem   E:\usr\local\Tivoli\bin\generic_unix\TDS\client\bin
@rem   If it is necessary it can be stored anywhere else.
@rem
@rem - Call this file from a icon on your desktop or from Windows
@rem   Start-Programs-Netview-... pull-down or from the command line.
@rem ********************************************************************************

@setlocal

@rem Changes the user's current working directory to the 'bin' directory in
@rem the "base" console installation path.
E:
cd E:\usr\local\Tivoli\bin\generic_unix\TDS\client\bin

@set TIVOLI=e:\usr\local\Tivoli\bin\generic_unix\Tds
@set INGJAR=\client\lib\INGNMCJDial.jar
@set FLBJAR=\ibmflb\jars\tivflb13.jar

set TCONSOLE_CLASSPATH=%TIVOLI%%FLBJAR%;%TIVOLI%%INGJAR%
tconsoleNT.bat   .. -key nmc
@endlocal
```

Figure 26. Sample to Start the NMC (for WIN Environment)

Installing and Customizing the TEC Event Server Workstation

The TEC event server can either run on a UNIX workstation or on a Windows NT® workstation. The following example describes the installation on UNIX. For the Windows NT installation, please use Windows NT command syntax.

1. Download the package file INGPTEC containing the workstation code from the host system to your workstation as a binary file. To download the package, you can, for example, use *FTP*. Choose as target path name any directory where you want to store the tarfile temporarily and unpack it for installation.

   Using FTP, the command is, for example:

   ```
   ftp <hostname>
   ```

   You will be prompted for your user ID and password. After logging on to your z/OS system, enter:

   ```
   binary
   get ING.SINGPWS1(INGPTEC) <PATH>/satec.tar
   quit
   ```

2. At your workstation, enter:

   ```
   cd <PATH>
   ```

3. Unpack the package file <PATH>/satec.tar:

   ```
   tar -xvf <PATH>/satec.tar
   ```

   This will unpack the workstation code for subsequent installation into the current directory (<*PATH*>).

   On Windows NT, you can find the `tar` command in

   ```
   c:\tivoli\bin\w32-ix86\tools\tar.exe
   ```

4. Install the appropriate Tivoli install package
   a. From the Tivoli desktop select ***Install->Install Product*** and follow the Install Product dialog
   b. Set the media path to the <*PATH*> which contains the SA z/OS specific install packages.
   c. Select the product to be installed.
   d. Close the Install Product dialog after installation.
5. Verify the installation. The files listed in Table 25 should be stored in the correct directories.

Note:

After installation, the binary files are stored in the following directory:

```
$BINDIR/SAOS390/NotificationService
```

The environment variable ***BINDIR*** is set when installing the Tivoli Framework. As default, it points to

```
/usr/local/Tivoli/bin/$INTERP
```

The environment variable ***INTERP*** denotes the platform where Tivoli is used, and can be for example *aix4-r1*.

Table 25. Notification Service Product Workstation Files

Member Name	Type	Purpose
tecad_sa390msg.baroc	TEC *baroc* file	defines event classes
tecad_sa390msg.rls	TEC *rls* file	defines rules
nvcons.ksh	korn shell script (*ksh*)	starts NetView 3270 Management Console for UNIX

Table 25. Notification Service Product Workstation Files (continued)

Member Name	Type	Purpose
nvcons.bat	batch file	starts NetView 3270 Management Console for Windows NT
tecad_sa390msg.tll	task library definition	contains the task library

If the NetView 3270 Management Console is not yet installed on your workstation, you can download it from the internet:

`http://www.ibm.com/software/support/`

Activating the Installed Files

You need to activate the following files of type:

- *rls* files
- *baroc* files
- *tll* files

Loading Classes and Rules

After downloading the files on the Tivoli workstation, several files are available in the directory

```
$BINDIR/SAOS390/NotificationService
```

The following instructions describe the steps required to activate the installed files at the TEC event server. These steps are necessary in order to exploit the Event/Automation Service for sending SA z/OS events to TEC. See the *Tivoli Enterprise Console Reference Manual* for a detailed description of the following commands:

- Use an existing rule base with GEM classes imported.
- Import the class file (.baroc) into the rule base:

  wrb-imprbclass tecad_sa390msg.baroc <rbname>
- Import the rules file (.rls) into the rule base:

  wrb -imprbrule tecad_sa390msg.rls <rbname>
- Compile the rule base:

  wrb -comprules <rbname>
- Load the rule base into the TEC event server:

  wrb -loadrb -use <rbname>
- Stop the TEC event server:

  wstopesvr
- Start the TEC event server:

  wstartesvr

Creating the System Automation Task Library

If the NetView 3270 Management Console is installed on a workstation in your network managed by Tivoli, you can use a task provided in the System Automation Task Library to start the NetView Client from the Tivoli Enterprise Console.

Depending on the platform where the NetView 3270 Management Console is installed, either a shell script (`nvcons.ksh`) for UNIX platforms or a batch file (`nvcons.bat`) for the Windows NT platform needs to be modified.

Note:
Windows NT setup:
- Modify the PATH variable via ***System Setup*** and add the path where ***Java*** is installed.
- Modify ***Tivoli Object Dispatcher Service*** via ***System Setup*** and allow the service to interact with the desktop in order to display the NetView Console.

- Edit the according file as appropriate:
  CLASSPATH variable (UNIX and Windows NT)
  Set to the path where Java classes are installed, add NetView class directory (see NetView documentation for details).
  NV variable (UNIX only)
  Set to path where NetView 3270 Management Console is installed on your system.
  Java variable (UNIX only)
  Set to path where Java is installed on your system.
  CD <NetViewDir> (Windows NT only)
  Set to directory where the NetView 3270 Management Console is installed on your system.

  Example for UNIX (nvcons.ksh):

```
export NV=/IBMFLB
export JAVA=/develop_driver/java/Java
export CLASSPATH=$JAVA/classes:$NV:$NV/sguide:$NV/sguide/SGJ023A.ZIP
:$NV/sguide/sguide.zip:$NV/src/ibmflb:$NV/jhelp
```

  Example for Windows NT (nvcons.bat):

```
set CLASSPATH=.;C:/users/java/lib/classes.zip
cd \IBMFLB
```

- Import the Task Library by using the wtll command (see the *Tivoli Management Framework Reference Manual* for details about this command).

```
wtll -p <policy region> -P <preprocessor> tecad_sa390msg.tll
```

  where
  <policy region>
  specifies the policy region in which to create the new task library. The policy region must exist within the local TMR.
  <preprocessor>
  specifies the path to the program to use as a preprocessor on the import file before it is parsed. The import file tecad_sa390msg.tll does not need to be preprocessed, so instead of specifying for example a C or C++ preprocessor, the command /bin/cat could be used.

Customization of the Tivoli Enterprise Console

To perform the steps described in this section, you should be familiar with the Tivoli terms ***event groups*** and ***event sources***. These are introduced in *Tivoli Enterprise Console User's Guide*.

In Tivoli, you may monitor events belonging to a group which may originate from a certain source or from different sources. In order to enable the TEC event server to handle the SA z/OS specific events, you may need to define the appropriate source to TEC.

To enable Tivoli administrators to monitor events on their event consoles, you need to define one or more appropriate event groups (with events from the defined event sources) and assign these groups to the respective administrators' event consoles.

Perform the following definition steps:

1. define the *event source* NV390MSG to forward messages and NV390ALT to forward alerts to TEC
2. define an event group by using the source and subsource attributes as filter criteria:
   - All events that originate from SA z/OS messages have SAOS390_SysOps as the subsource
   - All events that originate from SA z/OS alerts have SAOS390_ProcOps as the subsource
3. assign the defined event group to an Tivoli administrator's Tivoli Enterprise Console

Appendix A. Security and Authorization

This appendix describes how to install security options on your system.

Securing Focal Point Systems and Target Systems

Your operations staff and automation facilities at both focal point system and target systems need to be authorized to manage the resources in their environment. You can control human and automation operator authority through the password security provided by either:

- NetView
  - Operator definition file (DSIOPF)
  - Automation table
  - RODM access information
- A SAF-based security product such as RACF

The NetView facilities limit use of commands and keywords to authorized operators and limit an operator's span of control to specific systems. Access to the SA z/OS graphic interface is controlled by user ID, password, and RODM access information. Logic in the NetView automation table or in your automation routines can verify the source of a message before taking an action.

RACF can be used to limit the use of z/OS system commands to authorized operators.

When a target system is in the same sysplex as the focal point system, and your security product supports it, it is recommended that you share security definitions.

Operator Profiles

This sections provides information about operator profiles in two environments, in migrated ones and in RACF-based NetView ones.

Migrated Environments

Whether your operators work in a NetView environment that is RACF based or not RACF based, their authorization is:

```
AUTH CTL=GLOBAL
```

The following are all members of ING.SINGNPRF:

- AOFPRFAO
  - For all of system operations except the automatic restart management (ARM) element restart checker
- AOFPRFPI
  - For system operations automatic restart management element restart checker
- ISQPROF
  - For processor operations autotasks

Controlling Access to Console Commands for I/O Operations

The steps for doing this are

1. Define I/O console commands to RACF

2. Define consoles to RACF
3. Define TSO users who use the CONSOLE command to RACF
4. Allow consoles or TSO users to access I/O console commands

Use the procedure name you use to start I/O operations in the place of *ioproc*. This is either the name on the EXEC statement in the procedure, or if there is no name, the name of the member in SYS1.PROCLIB (or other procedure library that you use).

If you have already defined users and consoles to RACF, you need to do only the following:

```
RDEFINE OPERCMDS MVS.*.*.ioproc.* UACC(NONE)
PERMIT MVS.*.*.ioproc.** ID(userid) CLASS(OPERCMDS) ACC(UPDATE)
SETROPTS RACLIST(OPERCMDS) REFRESH
```

Defining I/O Console Commands to RACF: The information that follows describes the steps needed to tell RACF about I/O commands entered from a z/OS console.

All-or-Nothing Control: The following commands prevent any console user from controlling I/O operations:

```
SETROPTS GENERIC(OPERCMDS)
RDEFINE OPERCMDS MVS.*.*.ioproc.* UACC(NONE)
SETROPTS RACLIST(OPERCMDS) REFRESH
```

These commands do the following:

```
SETROPTS GENERIC(OPERCMDS)
```

SETROPS

This command tells RACF to use generic names for the class of resources called OPERCMDS (for operator commands). This means that the "*" character can be used to replace any name, and "**" can replace any subsequent names including no name at all.

```
RDEFINE OPERCMDS MVS.*.*.ioproc.* UACC(NONE)
```

RDEFINE

This command defines to RACF the resource name. In this case the name is the one that is used to protect a certain command. The positional parameter, OPERCMDS, tells RACF what kind of resource the name is used for.

Next the name is supplied, using generics. This name follows the z/OS resource naming convention. Using this name, z/OS console services can check with RACF for users' authority to invoke commands through console interfaces. In this case, the first * means we are protecting *any* console command that can affect I/O. These are the START, STOP, MODIFY, CANCEL, and FORCE commands. z/OS offers a further distinction between FORCE with and without the ARM parameter.

The second "*" is necessary because z/OS allows you to protect either submitted jobs (using JOB as the third position in the resource name) or started tasks (using STC, for Started Task Control, as the third position).

Note: A started task can be given a different name, or identifier, when it is started. For example, if SA z/OS's procedure is called INGEIO but operators want to use IOOPS, they can start SA z/OS with the following command:

```
START INGEIO.IOOPS,SUB=MSTR
```

From then on, only IOOPS or INGEIO.IOOPS can be used to identify the SA z/OS task in operator commands, while INGEIO will be unknown.

The ** in the RACF profile lets z/OS find the correct profile whether or not there is an identifier.

Then we supply the default access level, called UACC (for Universal Access). (The UACC levels are NONE, READ, UPDATE, CONTROL, and ALTER). UACC(NONE) keeps every user away from this command, unless we specifically give them authority.

```
SETROPTS RACLIST(OPERCMDS) REFRESH
```

SETROPTS

This command updates the RACF profile information that the system is using at this moment. This updates all of the access control information relating to operator command protection, since we've just been changing it. After this command, or after the next IPL, no unauthorized user will be allowed to use any SA z/OS command from any console interface.

Granular Control: You might want to allow some operators to have complete control over SA z/OS, but keep others from starting, stopping or cancelling it. These instructions allow you to pick and choose exactly which operators are allowed to issue which console commands.

The following commands will prevent any console user from controlling I/O operations:

```
RDEFINE OPERCMDS MVS.START.*.ioproc.**    UACC(NONE)
RDEFINE OPERCMDS MVS.STOP.*.ioproc.**     UACC(NONE)
RDEFINE OPERCMDS MVS.MODIFY.*.ioproc.**   UACC(NONE)
RDEFINE OPERCMDS MVS.CANCEL.*.ioproc.**   UACC(NONE)
RDEFINE OPERCMDS MVS.FORCEARM.*.ioproc.** UACC(NONE)
RDEFINE OPERCMDS MVS.FORCE.*.ioproc.**    UACC(NONE)
```

Notes:

1. See "Mixing Generic and Specific Resource Names" on page 173 for a description and examples of when to use specific resource names.
2. z/OS does not have the ability to distinguish between different product commands entered with the MODIFY operator command. So an operator who has been authorized to enter a non-intrusive command such as MODIFY IOOPS,DISPLAY TIMEOUT is also authorized to enter a more impacting command, such as MODIFY IOOPS,BLOCK (C0) * FORCE.

   Much greater granularity is available to protect the use of SA z/OS commands accessed through the application programming interface (API), which include access from ISPF, NetView, and the graphical workstation. If you need more levels of control, do not permit access of SA z/OS commands through the console interface. Use API controls instead.
3. These examples continue using the practice of replacing STC and JOB resource names with "*". You do not need to use the resource names with JOB, but you might still want to use "*" instead of STC.

Define Consoles to RACF: In the CONSOLxx member of SYS1.PARMLIB, there are several statements and attributes that you should be aware of:

The DEFAULT statement

can be used to control the initial security mechanism for consoles. The options are LOGON(AUTO), LOGON(OPTIONAL), and LOGON(REQUIRED).

The default value is OPTIONAL, which is the least intrusive to most installations' current operating procedures. The most secure is REQUIRED, and the easiest is AUTO.

The LOGON attribute is used to describe how and when operators must use the LOGON operator command. If the console operator does not use LOGON, the console has the authority level that is specified for it in the AUTH attribute of the CONSOLE statement.

The NAME attribute of the CONSOLE statement
is used to give each console a unique name.

You use the console name to tell RACF about the console. Rather than manage a new type of profile, RACF considers a console a user. So you tell RACF about a console by adding a RACF user profile with the console name as the user ID, like this:

```
ADDUSER (consoleid) PASSWORD(password)
```

Like other passwords with RACF, the password is initialized expired, so each console and console user is prompted to change the password the first time they logon.

The AUTH attribute of the CONSOLE statement
describes the *old* authorization level. If you don't use OPERCMD authorization, you are using AUTH levels. The levels are INFO, SYS, IO, CONS, and MASTER. The ALL authority is also available, which includes all of the SYS, IO, and CONS authorities.

The operator commands in question (such as START, STOP, MODIFY) are all in the SYS class of commands.

Typically, most consoles are given ALL or MASTER authorities, which means very little console security is in place. Using LOGON(AUTO) or INFO authority, or both, might be a big change to some installations, but it will provide much greater security for console operations.

Operators can use the LOGON command even when a console is already logged-on to another *userid*, although the previous *userid* will be automatically logged-off. In this way, operators can walk up to any console, issue LOGON with their *userid* and password, issue their desired operator commands, then LOGOFF before leaving. They can LOGON even while logged on to another console. This is so that operators are not locked out if they haven't issued LOGOFF from their usual console, but you could also have several consoles used with the same *userid* to share the same authorization class. It might not be as convenient as many operators are used to, but it is secure.

Define TSO Users Who Use the CONSOLE Command to RACF: You have to create a RACF profile for each TSO user who intends to use the TSO CONSOLE command.

```
RDEFINE OPERCMDS MVS.MCSOPER.userid UACC(NONE)
PERMIT MVS.MCSOPER.userid CLASS(OPERCMDS) ID(userid) ACC(READ)
SETROPTS RACLIST(OPERCMDS) REFRESH
```

These commands tell RACF about a profile, in the class of operator commands, that control access for the user *userid* to the Master Console Services for operator commands (MCSOPER). Initially, no one has access to the ability, but the PERMIT command specifies that user *userid* has access to the profile, thus the ability is permitted.

Like always, it doesn't take effect until after the SETROPTS RACLIST(OPERCMDS) REFRESH command.

Note: Some installations need to give RACF more information than normal for users who intend to use the CONSOLE command. Often this requires additional TSO parameters, such as accounting information, region size, or logon procedure name.

Allow Consoles or TSO Users to access SA z/OS Console Commands: Once the resource and console profiles are defined, controlling access to the commands is simple:

```
PERMIT MVS.*.*.ioproc.** ID(userid) CLASS(OPERCMDS) ACC(UPDATE)
```

This command permits user *userid* to access the function described by the profile MVS.*.*.*ioproc*.**. The user is given UPDATE authority. This authority is sufficient for the START, STOP, MODIFY, and CANCEL commands. The FORCEARM and FORCE commands require CONTROL authority.

To allow user *userid* to issue MODIFY commands to I/O operations, but not START or STOP it, use:

```
PERMIT MVS.MODIFY.*.ioproc.** ID(userid) CLASS(OPERCMDS) ACC(UPDATE)
SETROPTS RACLIST(OPERCMDS) REFRESH
```

Always make certain that you update the in-storage security information with the SETROPTS command after you have changed resource or profile information.

Mixing Generic and Specific Resource Names: You do not have to control each command with a specific resource name. RACF looks for a specific resource name before looking for a generic resource name. If a specific resource name is found, authorization is checked for it, otherwise authorization is checked against the generic name. You could easily protect all operator commands, then further protect the MODIFY command, then further protect modifying I/O operations with:
RDEFINE OPERCMDS MVS.** UACC(NONE) RDEFINE OPERCMDS MVS.MODIFY.** UACC(NONE) RDEFINE OPERCMDS MVS.MODIFY.*.*ioproc*.** UACC(NONE)

When describing granular control in "Granular Control" on page 171, we defined specific resource names (with a "*" for JOBor STC) for each operator command that can control SA z/OS, such as START or MODIFY.

One approach is to offer two types of SA z/OS access: one for operators who can issue the MODIFY command, but no other commands and one for other operators who have access to all commands. In such a case, you might make a generic access resource and a specific resource for MODIFY, and grant MODIFY access to the first group and both MODIFY and generic to the second group, like this:

```
RDEF OPERCMDS MVS.*.*.ioproc.**      UACC(NONE)
RDEF OPERCMDS MVS.MODIFY.*.ioproc.** UACC(NONE)
PE MVS.*.*.ioproc.**      ID(userid) CLASS(OPERCMDS) ACC(CONTROL)
PE MVS.MODIFY.*.ioproc.** ID(userid) CLASS(OPERCMDS) ACC(UPDATE)
PE MVS.MODIFY.*.ioproc.** ID(modify_id) CLASS(OPERCMDS) ACC(UPDATE)
```

If most operators need a "base level" of access and only a few need to issue the other commands, and you want to easily add and remove these base level commands, you can define specific resource names for the commands that need special protection, and the generic resource is used for access to the base. This example defines a general authorized operator *userid* to START, STOP, and CANCEL, and *modify_id* to have access to all commands:

```
RDEF OPERCMDS MVS.*.*.ioproc.**        UACC(NONE)
RDEF OPERCMDS MVS.MODIFY.*.ioproc.**   UACC(NONE)
RDEF OPERCMDS MVS.FORCEARM.*.ioproc.** UACC(NONE)
RDEF OPERCMDS MVS.FORCE.*.ioproc.**    UACC(NONE)
PE MVS.MODIFY.*.ioproc.**   ID(modify_id) CLASS(OPERCMDS) ACC(UPDATE)
PE MVS.FORCEARM.*.ioproc.** ID(modify_id) CLASS(OPERCMDS) ACC(CONTROL)
PE MVS.FORCE.*.ioproc.**    ID(modify_id) CLASS(OPERCMDS) ACC(CONTROL)
PE MVS.*.*.ioproc.**        ID(modify_id) CLASS(OPERCMDS) ACC(UPDATE)
PE MVS.*.*.ioproc.**        ID(userid) CLASS(OPERCMDS) ACC(UPDATE)
```

This method allows you access from a console to all of I/O operations or to none of it.

RACF-Based NetView Environments

The following information does not address general administration of RACF-based security in the NetView environment or all that is involved in deciding to migrate to RACF-only security. To learn about that, see *Resource Access Control Facility (RACF) Security Administrator's Guide*

Full RACF checking for SA z/OS includes:

- Verifying that an operator (whose identity was already authenticated at logon time) is permitted to perform a specific function with a specific operand or option
- Using NetView to check that the operator who originally issued the command is authorized. This is more secure than checking to see that the operator who sends the command is authorized on the system where the command is sent.

To enable full RACF authorization checking, set these option statements with the following NetView keywords and values:

Name of NetView Member	Function within NetView	Keyword and Value	Purpose of Change
DSIDMN	NetView domain definition member	OPERSEC=SAFDEF	Set NetView to use RACF for general operator authentication and authorization. The broadest of all security settings.
		OPSPAN=SAF	Sets authorization of the START SPAN command. This value is the default and is the only possible choice when OPERSEC=SAFDEF is set.
		CMDAUTH=SAF	Sets NetView to use RACF for general command authorization.
		BACKTBL=*table_name*	Provides a backup authorization mechanism to be in place when RACF is not available.
		AUTHCHK=SOURCEID	Sets NetView to perform authorization against the ID of the original command issuer.
		SAFNODEC={PASS|FAIL}	Tells NetView what decision it should make on its own when RACF is not available or under certain other circumstances. See the NetView documentation for the consequences of using the default PASS or changing it to FAIL.
DSIUINIT	Initialization member for the DSIUDST task that handles RMTCMD data services	RMTSECUR...SAF	Causes RACF authorization checking for the initial RMTCMD request and ENDTASK requests, based on the RACF RMTOPS class
DSICMD	NetView command definition sample	CMDCML...SEC=DE	Controls authorization at an individual command level.

NetView operators' authorizations are set up by:

- Creating a profile for each instance of NetView in the APPL class. This is done with RDEF and by using as the resource name the DOMAINID from the NCCFID statement in DSIDMN.
- Issuing RACF PERMIT commands for each operator, specifying the resource name (as defined with RDEF), the class (APPL), the operator ID, and the access level for the operator.

Authorizations are stored in a NetView segment for each operator. This is done by specifying a value for CTL with the RACF ALTUSER command with OPERSEC=SAFDEF. Assuming that operator *AUTBASE* has been defined by

```
AUTBASE    OPERATOR   PASSWORD=XYZ123
PROFILEN   AOFPRFAO
```

in the definitions pulled into DSIOPF and

```
AOFPRFAO   PROFILE    IC=AOFPARCR
AUTH       CTL=GLOBAL
OPCLASS    1,2
END
```

in the operator profile, then the new definitions for the RACF environment are:

```
ADDUSER AUTBASE PASSWORD(XYZ123)
ALTUSER AUTBASE NETVIEW(IC(AOFPARCR) CTL(GLOBAL) OPCLASS(1,2))
```

To authorize a NetView operator to start a span (assuming that OPSPAN=SAF is set), you need to:

- Create a profile for the span in the NETSPAN class with RDEF
  - Other existing definition steps for the span such as listing the span name in the SPANLIST statement in DSISPN are unchanged.
- Set up for each operator PERMITS with access authority appropriate for the function that the operator is allowed to execute within that span.
  - UPDATE authority is often the one required to make changes in important commands like VTAM VARY.
- Authorize use of the individual commands.

To check an operator's access to a certain resource, you can use either:

- NetView QRS command or DSIQRS macro, in which the check can be by resource name or by RODM object ID
- CNMSCOP service, which determines whether a particular user is authorized to use a specific command, keyword, or value combination. This is available from a high-level language.

To assign a default extended MCS console name for operators, you can use either:

- The CONSNAME field of the NetView segment when OPERSEC=SAFDEF and `ALTUSER AUTBASE NETVIEW(...CONSNAME(AMZ$123)...)`
- GETCONID CONSOLE=x where the console ID is x. This method is preferred to the default name in CONSNAME and must be used when the default name is already in use or defaulting to the NetView task name or operator ID (if nothing is specified in CONSNAME).

Protecting Commands Defined to NetView

Some SA z/OS commands can be defined to NetView. After these have been activated with SETR CLASSACT(NETCMDS) and SETR GENERIC(NETCMDS), you can establish their security restrictions by issuing RACF RDEF definitions for each command, keyword, and value and combination of these.

When this is used, the resource name is in the form

```
NETID.LUNAME.COMMAND.KEYWORD.VALUE
```

where

NETID
: The netID from the last VTAM activation. You may chose to use something generic here if your situation makes that preferable.

LUNAME
: Name specified in the NCCFID statement in DSIDMN, the NetView domain ID

COMMAND
: Name on the CMDMDL statement in DSICMD for the command. This is not a synonym defined by the CMDSYN statement

KEYWORD
: Name required only if you desire to have operand and value-level checking

VALUE
Name required only if you desire to have operand and value-level checking

Then issue RACF PERMIT commands for each operator, specifying the resource name (as defined with RDEF), the class (APPL), the operator ID, and the access level for the operator. The standard access level required for NetView commands is READ.

In the NetView CMDMDL statement in the DSICMD member, the keyword SEC can have one of these values:

BY Indicates that NetView should bypass authority

CH Indicates that NetView should check authority

DE Indicates that NetView should defer a decision about checking until the command is issued and make the decision then based on whether the command is or is not issued from the automation table. If the command is issued from the automation table, authorization is checked if AUTOSEC=CHECK is set by use of the DEFAULTS command and not checked if AUTOSEC=BYPASS. If the command is not issued from the automation table, authorization is always checked.

When the SEC keyword is not specified in the CMDMDL statement or there is no such statement for the command or command procedure. SEC=DE is the default.

Granting NetView and the STC-User Access to Data Sets

This section describes what levels of access authorities you need to assign to NetView and to specific started tasks.

Access to XCF Utilities

The CDS recovery as well as some operator commands use the XCF utilities to retrieve couple data set information. Because the DD name SYSPRINT is required by the utilities, but can also be assigned by NetView for holding log data, the call of the utilities is implemented as a started task in the PROCLIB. The input and output data sets used by the started tasks are dynamically allocated and deleted by the NetView address space. This requires the RACF ALTER access to these data sets for NetView.

When the address space of the started task is created, the operating system assigns a user ID (IBM default: STCUSER) to the started task. This user ID must have RACF UPDATE access to the data sets. The data set names are created as follows:

```
hlq.domain.HSAyyddd.Xhhmmss
```

where:

hlq is the high-level qualifier for temporary data set defined during the customization

domain is the domain ID of the current NetView

X is I, O, or P

Access to HOM Interface

Sometimes after an IPL an operating system does not know its sender paths to the coupling facilities in the sysplex. In this case the automation functions call the HCD HOM interface to determine the missing path information. As the HOM interface must not run authorized the interface is called via a started task. The input and output data sets used by the started tasks are dynamically allocated and deleted by the NetView address space. This requires the RACF ALTER access to these data sets for NetView.

When the address space of the started task is created, the operating system assigns a user ID (IBM default: STCUSER) to the started task. This user ID must have RACF UPDATE access to the data sets. The data set names are created as follows:

```
hlq.domain.HSAyyddd.Xhhmmss
```

where:

hlq is the high-level qualifier for temporary data set defined during the customization

domain is the domain ID of the current NetView

X O or P

Access to IPL Information

The new automation function collecting, displaying, comparing, and deleting IPL information uses two started tasks. It is recommended to run the first started task immediately after an IPL as part of COMMNDxx list processing, to collect the IPL information in the SA z/OS VSAM data set ″IPLDATA″. The remaining functions are handled by a NetView command. Since the started task as well as the command can delete IPL information both need RACF CONTROL access to the VSAM data set. The started task collecting the information needs RACF READ access to all parmlib members.

When a comparison of IPL information is requested the NetView command schedules the second started task to call ISRSUPC—the compare utility provided by ISPF—as this utility requires fixed ddname. The input and output data sets used by the second started tasks are dynamically allocated and deleted by the NetView address space. This requires the RACF ALTER access to these data sets for NetView.

When the address space of the started task is created, the operating system assigns a user ID (IBM default: STCUSER) to the started task. This user ID must have RACF UPDATE access to the data sets. The data set names are created as follows:

```
hlq.domain.opid.INGPIPLx
```

where:

hlq is the high-level qualifier for temporary data set defined during the customization

domain is the domain ID of the current NetView

opid is the NetView operator ID

x L, N, or O

Access to Spare Couple Data Sets

Because the CDS recovery allocates and deletes spare couple data sets via an XCF utility the user ID assigned to the started task address space must also have RACF ALTER access to these couple data sets. The names of the spare couple data set are built as follows:

```
hlq.cdstype.CDSnn
```

where:

hlq is the high-level qualifier for couple data sets defined during the customization

cdstype is ARM, CFRM, LOGR, SFM, SYSPLEX

nn is the sequence number corresponding to the volume entry in the list of volumes

Access to User-Defined Couple Data Sets

In addition, the user ID of the started task address space needs RACF READ access to all user-defined couple data sets. And, when LOGGER recovery is enabled, the user ID needs RACF ALTER access to the LOGR couple data sets as well.

Access to Spare Local Page Data Sets

The new auxiliary shortage recovery allocates and formats spare page data sets. For this reason NetView requires RACF ALTER access to these page data sets. The names of the spare page data set are built as follows:

```
hlq.sysname.Vvolume.Snn
```

where:

hlq is the high-level qualifier for page data sets defined during the customization

sysname is the name of system for which the data set is allocated

volume is the serial number of the volume on which the data set is allocated

nn is a unique sequence number

Restricting Access to INGPLEX and INGCF Functions

This section describes how you can grant and control access of users to the INGCF and INGPLEX commands.

Access to sensitive functions of the INGPLEX and the INGCF commands should be granted to certain operators only. To do this, add one or more value classes to the operator classes of the operators to authorize them to one or all of the functions.

The following key classes and value classes are applicable:

KEYCLASS=INGPLEX VALCLASS=CDS allows for:

- Allocating an alternate CDS via the INGPLEX CDS command
- Controlling the SDUMP options and the SLIP traps sysplex-wide

KEYCLASS=INGCF VALCLASS=STR allows for:

- Forcing the deallocation of a CF structure via the INGCF STRUCTURE command
- Rebuilding a CF structure on another CF via the INGCF STRUCTURE command
- Controlling the SDUMP options and the SLIP traps sysplex-wide

KEYCLASS=INGCF VALCLASS=CF allows for:

- Preparing a CF for removal from the sysplex via the INGCF DRAIN command
- (Re)integrating a CF into a sysplex via the INGCF ENABLE command
- Including KEYCLASS=INGCF VALCLASS=STR

KEYCLASS=INGPLEX VALCLASS=HW allows for:

- Deactivating the LPAR of a CF via the INGCF DRAIN command
- Activating the LPAR of a CF (=starting the Coupling Facility Control Code) via the INGCF ENABLE command
- Including KEYCLASS=INGCF VALCLASS=CF

To activate the authorization check, add the definition of the SA z/OS Clist INGRCCHK, the key classes and the value classes in the NetView DSIPARM member DSICMD, as in the following example:

```
INGRCCHK CMDMDL MOD=DSICCP,ECHO=N,TYPE=R
     INGPLEX KEYCLASS 3,5
     CDS     VALCLASS 3
     HW      VALCLASS 5
     INGCF   KEYCLASS 3,4
     STR     VALCLASS 3
     CF      VALCLASS 4
```

With these definitions operators with opclass=3 specified in their operator profiles are authorized to issue all functions of the INGPLEX CDS and the INGPLEX CF commands.

Operators with opclass=4 specified in their operator profiles are authorized to issue all functions of the INGCF CF and the INGCF STRUCTURE commands. Value class 4 includes value class 3 of INGCF but not the value class of INGPLEX.

Controlling Access to OMEGAMON Monitors

OMEGAMON provides both product level security and command level security:

- Product level security is applied when users log on to OMEGAMON
- Command level security is applied when users issue commands

A generic SA z/OS userid must be defined to SAF or OMEGAMON for external or internal product level security, respectively.

For commands protected only by internal security, command locking must be enabled for this userid, based on the command authority level needed by SA z/OS. For example, if only level 0 and 1 commands are issued from SA z/OS, an INITIAL1 rule must be defined and permission must be granted to the generic user and at the same time there must be no INITIAL*b* rule. In the absence of INITIAL*n* rules, the command authority level for SA z/OS is always 0. For further details, refer to the OMEGAMON documentation.

For commands protected by external security, appropriate command resource profiles have to be created and permission must be granted to the generic user.

Note that even though the SA z/OS generic user has the potential to issue any level *n* command, you can use NetView command security to selectively define (on an operator by operator or group by group basis) which operator or group can issue a particular command.

NetView Command Authorization

Because SA z/OS uses a common userid that establishes sessions between SA z/OS and any OMEGAMON, SA z/OS uses NetView and the command authorization table to control access to:

- OMEGAMON sessions
- OMEGAMON commands
- The administration of OMEGAMON sessions

For details about the command authorization table, refer to the *NetView Security Reference* manual.

The common userid that is specified with the OMEGAMON session definitions represents the set of users (autotasks, operators) that interact with OMEGAMON sessions. It needs to be defined to OMEGAMON with the highest security level that has been granted to automation. This approach simplifies the customization that is required within OMEGAMON to permit access to the monitor.

Table 26 shows the new SA z/OS command names, keywords, and values that can be protected along with their associated SAF resource or command authorization table identifier.

Table 26. Command Authorization Identifiers

Commands and Keywords	Command List Name	SAF Resource or Command Authorization Table Identifier
INGOMX NAME CMD	INGROMX0	*netid.luname*.INGROMX0 *netid.luname*.INGROMX0.NAME.*session_name* *netid.luname*.INGROMX0.CMD.*command*
INGSESS REQ START STOP	INGRYSS0	*netid.luname*.INGRYSS0 *netid.luname*.INGRYSS0.REQ *netid.luname*.INGRYSS0.REQ.START *netid.luname*.INGRYSS0.REQ.STOP

Notes

1. For OMEGAMON commands that contain a period, replace it with an '@' when defining the command authorization entry, for example, to protect `.RMF` use:

   ```
   PROTECT *.*.INGROMX0.CMD.@RMF
   ```

2. If you want to use TRAP for OMEGAMON for IMS, CMD authorization for XIMS must be given and for the other monitors, CMD authorization for EXSY must be given.

Consider adopting the following approach to defining command authorization:

- For maximum security, protect all sessions and all commands.
- Permit access to sessions and commands only as needed.
- Administrators need INGOMX-NAME and INGSESS-REQ authorization.

Password Management

Logging on to OMEGAMON requires authentication with a user ID and password if product level security is active. Note that when a password is specified, it appears in readable format in the automation configuration file and in logs. When SAFPWD is specified, the password is stored in a VSAM data set in an encrypted format.

The NetView command GETPW is used to access the password data set to set or read the password.

SA z/OS uses GETPW as follows:

- Passwords are stored and retrieved by *userid* and *owner*
- *userid* is the common user defined to log on to an OMEGAMON session
- *owner* is a custom value representing one or more VTAM application IDs as defined in the authentication policy
- If no owner is defined for an application ID, it defaults to the 5 leftmost characters of the application ID

To use SAFPWD, an authentication policy item in the network policy has to be specified where all applications denoted by the OMEGAMON applid that share the same password are assigned to a single owner.

To define the authentication policy select the AUTHENTICATION policy item for the appropriate network policy. In the Authentication Definitions panel enter your definitions in the Owner and Share fields, as shown in Figure 27.

```
COMMANDS  HELP
------------------------------------------------------------------------------
                     Authentication Definitions (GETPW)     Row 1 to 5 of 20
Command ===>                                                 SCROLL===> PAGE

Entry Type : Network               PolicyDB Name   : SAMPLES_BASE
Entry Name : OMEGAMON_SESSIONS     Enterprise Name : SECNETS

Owner Share
AOMON IPSPM2RC IPSPOC0
```

Figure 27. Authentication Definitions Panel for Sessions

Where the fields have the following meanings:

Owner
Custom value, up to 5 characters, used by SA z/OS to look up the password in the NetView password data set when an OMEGAMON session with any of the VTAM application IDs listed next is started.

Share List of VTAM application IDs representing OMEGAMON monitors for which passwords are kept in the NetView password data set under the same owner key.

Authentication Using the NetView Password Data Set

The NetView password data set is used as a password safe if you do not want to reveal passwords in your policy database. The password data set has to be created first and allocated upon the start of NetView. Refer to *NetView Installation: Configuring Additional Components* for details.

You are responsible for setting the initial password for a user ID with a given owner in the password data set using the NetView command GETPW. Whenever a logon is made to OMEGAMON, for sessions with SAFPW defined as the user password, SA z/OS attempts to look up that user's password in the password data set. If the lookup succeeds, GETPW returns either the current password or, if the 30-day validity period has expired, the current and a new password.

On logging on to OMEGAMON, the current password is used to authenticate the user ID. If a new password is available, the new password is also changed on the OMEGAMON logon screen. Upon successful password update in OMEGAMON, the new password is also updated in the password data set using GETPW.

You are responsible for ensuring that the password in the password data set and the password known to SAF or OMEGAMON are the same, in particular when shared SAF databases are used in a multisystem complex, for example, a Parallel Sysplex. In this case, the password data sets should also be shared by the same group of systems.

Use the GETPW command to initialize the password data set. For example, suppose the session and password share definitions are set as in Figure 27 on page 182 for user `oper1` and owner `AOMON`, the GETPW command format would be:

```
GETPW oper1 AOMON,INIT=pw,MASK=%A%N%N%A%A%A%A%A
```

where *pw* is the initial password for the user ID and the MASK parameter indicates that the password should be 8 characters long, beginning with a letter, followed by 2 numbers and then 5 letters.

See *Tivoli NetView for z/OS Command Reference Volume 1* for further details about the GETPW command.

Controlling Access to the Processor Hardware Functions

For processor operations SNMP processor connections and for the Parallel Sysplex enhancements functions that use the BCP internal interface, a SAF product such as RACF must be used to define the required resources and grant access to these resources for the authorized NetView users and autotasks.

Allowing NetView to Use the BCP Internal Interface

Before you can use the enhanced sysplex functions of SA z/OS for CF or XCF automation, the hardware resource (HSAET32) must be defined in NetView.

1. Define resource HSA.ET32OAN.HSAET32 in the CLASS FACILITY
2. Permit NetView READ ACCESS to this facility class resource

The following example shows the RACF commands used to define the resource and to grant the required READ access for the NetView user.

```
SETROPTS CLASSACT(FACILITY)
SETROPTS RACLIST(FACILITY)
RDEFINE FACILITY HSA.ET32OAN.HSAET32 UACC(NONE)
PERMIT HSA.ET32OAN.HSAET32 CLASS(FACILITY) ID(stcuser) ACC(READ)
```

With the SETROPTS command, the RACF class FACILITY is made available. With the SETROPTS RACLIST command the FACILITY class resource profile copy in the RACF data space is enabled to increase performance. The next command, RDEFINE, fully qualifies the HSAET32 resource and sets universal access to none. With the PERMIT command, the RACF defined user *stcuser* gets READ access to

this resource. User ID *stcuser* must be the user ID associated with your NetView started task. If you start NetView as a regular job, the user ID submitting the job must be authorized for the resource.

Note that you can use a wildcard character to specify the resource more generic if that is suitable for your environment.

Access to the CPCs

Each processor (CPC) defined in your SA z/OS policy data base must have a corresponding resource profile defined with your SAF product. Note that this only applies for processors defined with a connection type SNMP or INTERNAL.

The skeleton of the CPC resource is:

```
HSA.ET32TGT.netid.nau
HSA.ET32TGT.netid.nau.lpar
```

The netid.nau part of the resource name corresponds with the netid.nau definition of the CPC entry specified in the customization dialog. The period between netid and nau is part of the resource name. For LPAR protection define a resource with the netid.nau.lpar specification.

The following example shows how to define a CPC resource in RACF.

```
RDEFINE FACILITY HSA.ET32TGT.DEIBMD1.X7F1F30A UACC(NONE)
```

The CPC with netid DEIBMD1 and nau X7F1F30A is defined as a resource in the RACF class facility with a universal access attribute of NONE.

Note that you can use a wildcard character to specify the resource more generic if that is suitable for your environment.

Levels of CPC Access

The following lists the access levels and their meaning for the CPC resources.

- READ—Retrieve, get configuration information from the CPC
- WRITE—Update, set configuration information of the CPC
- CONTROL—Issue operations management commands of the CPC

Note: this access level scheme is for the CPC and its LPARs.

Defining the CPC access lists

Depending on the NetView operator security chosen, the access level is checked differently. If your NetView operator security (OPERSEC) is set to MINIMAL, NETVPW, or SAFPW, the userid that is checked for hardware access is always the userid that started the NetView address space, which is usually a STC userid. This userid has to be authorized for all CPC and CPC.Lpar resources you want to manage with this NetView. If multiple users are allowed to start NetView, make sure they are all authorized.

If you have chosen a NetView operator security level of OPERSEC=SAFDEF or OPERSEC=SAFCHECK, the following paragraph applies.

With SA z/OS, several NetView autotasks need to be authorized to access the CPCs that are defined in the customization dialog.

The following NetView autotasks need to be authorized with access level CONTROL for **all** defined CPCs and all its LPARs:

- The XCF autotasks
- The autotasks defined with SYN %AOFOPXCFOPER% in automation table member AOFMSGSY
- The HW interface autotasks AUTHWxxx

The AUTXCFxx autotasks plus the additional ones from %AOFOPXCFOPER% are used internally once INGCF drain or INGCF enable is invoked by an authorized user. IXC102A message automation is also performed by these autotasks.

The autotasks used for the HW interface initialization and communication also need to be authorized. Use access level CONTROL for the AUTHWxxx autotasks in your environment.

The following example shows how to permit access to a CPC resource in RACF:

```
PERMIT HSA.ET32TGT.DEIBMD1.X7F1F30A CLASS(FACILITY) ID(AUTXCF) ACC(CONTROL)
```

The XCF autotask AUTXCF gets access level CONTROL for the CPC resource DEIBMD1.X7F1F30A.

LPAR access example:

```
PERMIT HSA.ET32TGT.DEIBMD1.X7F1F30A.* CLASS(FACILITY) ID(AUTXCF) ACC(CONTROL)
```

The XCF autotask AUTXCF gets access level CONTROL for the CPC resource DEIBMD1.X7F1F30A and all its defined logical partitions.

Implementing Granular Hardware Access

By giving operators READ access to a CPC resource and CONTROL access only to LPARS according to the business needs, a flexible security scheme can be implemented.

Defining an RACF Profile for I/O Operations

Assign authorization levels using RACF/SAF for individual commands or generically for all commands. Use the RACF RDEF command with a class of FACILITY.

Function	Command
To define the profile for the PROHIBIT command	RDEF FACILITY IHV.PROHIBIT
To define a profile that would allow all users to enter a command (for example, UNLOCK)	RDEF FACILITY IHV.UNLOCK UACC(READ)
To permit the use of generics for a Class of Service facility	SETROPTS GENERIC FACILITY
To prevent unauthorized use of commands you can enter this RACF command to prohibit use of commands	RDEF FACILITY IHV.* UACC(NONE)

Note: If you have prohibited all user IDs from using these commands, you must explicitly assign RACF authorization to designated user IDs.

Assign RACF Authorization

To give RACF authorization to a user ID, enter the RACF PERMIT command and its parameters.

Assign a Profile Parameter

The profile parameter is IHV*commandname*, where:

- IHV. is the three-character ID, followed by a period (.).
- *commandname* is the name of the command

Notes:

1. The profile parameter (for example, IHV.ALLOW, IHV.VARY, IHV.REMOVE.SWITCH) determines the authorization level of the user ID identified in the ID parameter.
2. The ACCESS parameter identifies the authorization given.

   You can use an asterisk to designate a generic class on the PERMIT parameters. For example, to allow all users to send all commands that require read authority, enter:

   ```
   PERMIT IHV.* ACCESS(READ) CLASS(FACILITY)
   ID(*)
   ```

Assign Authorization by ACCESS Level

You can authorize a user ID to enter one command at a given access level by entering one command.

For example, to allow a user (SUWAJDA) to send commands requiring control authorization, enter:

```
PERMIT IHV.* ACCESS(CONTROL) CLASS(FACILITY)
ID(SUWAJDA)
```

For example, to authorize another user (FISHER) to enter all commands that require the update authorization, enter:

```
PERMIT IHV.* ACCESS(UPDATE) CLASS(FACILITY)
ID(FISHER)
```

Assign Authorization by Command

You can use the PERMIT command to let all users send individual commands. For example, to authorize everyone to use the Unlock command, enter:

```
PERMIT IHV.UNLOCK ACCESS(READ) CLASS(FACILITY)
ID(*)
```

To authorize a user (DONC) to send all connectivity commands with the Noforce option, enter:

```
PERMIT IHV.* ACCESS(UPDATE) CLASS(FACILITY)
ID(DONC)
```

Use Specific Profile Names

Either specific profile names or generic profile names can be used in the PERMIT command. Use specific profile names to authorize use of specific I/O operations commands.

For example, to authorize a user (PHILOP) to use only the Allow and Prohibit commands with the Noforce option, enter:

```
PERMIT ING.ALLOW ACCESS(UPDATE) CLASS(FACILITY) ID(PHILOP)
PERMIT ING.PROHIBIT ACCESS(UPDATE) CLASS(FACILITY) ID(PHILOP)
```

On the NMC focal point the following is necessary to define users and access levels to RODM:

1. Define a general resources class named RODMMGR. This is the default class name used in EKGCUST initialization member for RODM.
2. Define instances of the RODMMGR resource class, for example,

```
RDEF EKGXRODM1 CLASS(RODMMGR) UACC(NONE)
RDEF EKGXRODM2 CLASS(RODMMGR) UACC(NONE)
RDEF EKGXRODM3 CLASS(RODMMGR) UACC(NONE)
RDEF EKGXRODM4 CLASS(RODMMGR) UACC(NONE)
RDEF EKGXRODM5 CLASS(RODMMGR) UACC(NONE)
RDEF EKGXRODM6 CLASS(RODMMGR) UACC(NONE)
```

For more information on the RACF commands, see *Resource Access Control Facility (RACF) Command Language Reference*.

Establishing Authorization With Network Security Program (NetSP)

If you have installed NetSP, you can create an authorization system requiring only one sign on for each user. With it, a user who logs on from a workstation has access to RACF-protected host applications. These include 3270 emulation and log on scripts and APPC communications. This authorization is controlled by NetSP's PassTicket, which is recognized by the SAF-based security system and is valid for a fixed period of time.

To establish authorization for your users, you need to create in NetSP recorded input files as log on transfer scripts. This is done either by recording keystrokes in the emulator session or by entering them directly in a file with a text editor. How to do this is described in *Network Security Product Secured Network Gateway Guide*.

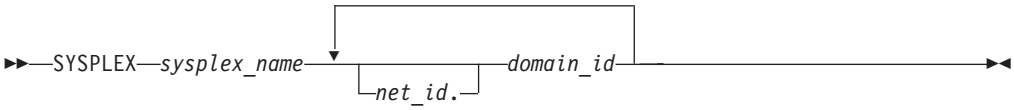
Appendix B. Syntax for INGTOPOF File

The INGTOPOF file contains configuration information for the SA z/OS topology manager. It must reside in any of the data sets allocated under the DSIPARM concatenation. The records of the file consist of a keyword with one or more parameters. Comment lines must start with an asterisk (*). A '+' at the end of a line indicates that the record is continued in the next line.

The following keywords can occur in the INGTOPOF file: SYSPLEX, PROCOPS, LOCATION, ANCHOR, BLDVIEWS, OPTION, and TEMPLATE.

The SYSPLEX Statement

For every sysplex, the SA z/OS topology manager must be told which systems of the sysplex are able to communicate with it. This is done with the SYSPLEX statement according to the following format:



The *sysplex_name* must be different from every name that you specify in a PROCOPS statement (see "The PROCOPS Statement" on page 190). The systems must be identified to the SA z/OS topology manager by their NetView domain ID. If the *net_id* is omitted, it is assumed to be the same as that of the focal point. The INGTOPOF file must contain at least one SYSPLEX statement; in particular, you cannot have a PROCOPS statement in the INGTOPOF file without a SYSPLEX statement.

The SA z/OS topology manager tries to contact the systems in the order in which they appear in the list. When it finds a system that contains a functional SA z/OS topology agent, it searches no further, but gathers the SA z/OS information from the automation manager through this SA z/OS topology agent. It then stores the retrieved information within RODM, prefixing all resource names with the *sysplex_name* that it found in the SYSPLEX statement.

It follows from this that the order in which the domains are specified should reflect eventual decisions about primary and backup systems for communication with the SA z/OS topology manager. Also, the sysplexes as defined in the INGTOPOF file must correspond to the sysplex groups in the policy database.

Since stand-alone systems are treated as sysplexes, they must also be introduced to the SA z/OS topology manager by a SYSPLEX statement. In this case, the list of domain IDs will comprise just one item.

If you want to have a network anchor for a system, this system's domain ID must be included in the SYSPLEX statement.

The PROCOPS Statement

With this statement, you specify a focal point for processor operations and its backup focal point. It has the following format:

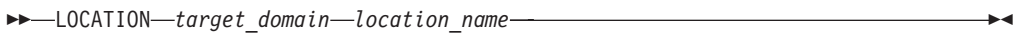
The *procops_name* must be different from every name that you specify in a SYSPLEX statement. The focal point processor and its backup must be identified to the SA z/OS topology manager by a NetView domain ID. If the *net_id* is omitted, the SA z/OS topology manager assumes it to be identical to that of its own focal point.

There must be at least one SYSPLEX statement in the INGTOPOF file if you want to insert a PROCOPS statement.

The LOCATION Statement

The LOCATION statement is used to group system related events, for example, geographically rather than logically. The events that are attached to a LOCATION must be posted to the SA z/OS topology manager by the user with the INGPOST command. For more information on the INGPOST command, see *IBM Tivoli System Automation for z/OS Operator's Commands*.

The Location statement has the following format:



Examples:

```
*
* TSCF1 thru 3 are in Boeblingen, 4 and 5 are in Perth
*
LOCATION T2 BB_LAB
LOCATION NETOZ.CNMT4 PERTH
LOCATION NETOZ.CNMT5 PERTH
*
* AOCA thru D are in Boeblingen
*
LOCATION AOCPLEX BB_LAB
*
* OZ1 thru OZ4 are in Perth
*
LOCATION OZPLEX PERTH
```

The ANCHOR Statement

ANCHORS are entered via the customization dialogs on the target systems. For more information about how to define anchors see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

The ANCHOR statement will remain in the INGTOPOF to allow ANCHORs to be defined for downlevel systems where ANCHORS are not entered via the customization dialogs.

ANCHORs for downlevel systems will occur in RODM, but not within the automation manager.

The ANCHOR statement serves to define anchors for arbitrary user defined events.

Anchors serve to collect events of a certain type that are to be displayed on the NMC. Anchors play the role of major resources for events of this type, and the events themselves are treated as minor resources of their anchor. The SA z/OS topology manager automatically creates anchors for heartbeats but not for WTOR or tape mount requests.For more information on anchors and events see *IBM Tivoli System Automation for z/OS User's Guide*.

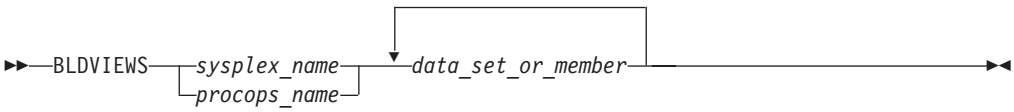
With the ANCHOR statement, you can introduce your own anchors for any events. These events must be posted to the SA z/OS topology manager with the INGPOST command; the anchor must be specified in the command as the major resource (RESOURCE parameter). For more information on the INGPOST command, see *IBM Tivoli System Automation for z/OS Operator's Commands*; for information on major and minor resources, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*

The BLDVIEWS Statement

A RODM resource can only be displayed on the NMC when it is included in a view. With the BLDVIEWS statement, you can pass data sets (members) that contain view definitions for BLDVIEWS to the SA z/OS topology manager. The SA z/OS topology manager will then call the BLDVIEWS tool for (all or some of) these data sets (members) in order to build or rebuild the specified views. The view definitions must be supplied by the customer.

Every BLDVIEWS statement associates one sysplex (as defined by a SYSPLEX statement) or one processor operations focal point configuration (as defined by a PROCOPS statement) with a list of such data sets (members). This enables the SA z/OS topology manager to rebuild views at runtime only for those sysplexes (sets of target processors) whose SA z/OS information has in fact changed.

The BLDVIEWS statement has the following format:



You can exploit the association of the data sets (members) to sysplexes to reduce the overhead caused by rebuilding views at runtime. Suppose, for example, that all your sysplex views either contain objects from only one sysplex or from all sysplexes. Then you should proceed as follows.

1. For every sysplex, create a separate data set (member) with the view definitions specific for that sysplex.
2. Create one data set (member) for the common views.
3. Code a BLDVIEWS statement for every sysplex, where the list of data sets (members) comprises two items, namely the data set (member) with the views specific for this sysplex, and the data set (member) with the common views.

In this way, the sysplex specific views are rebuilt only when the SA z/OS resources for the sysplex in question have changed within RODM in such a way that a rebuild is necessary.

For more details on view definitions, see *IBM Tivoli System Automation for z/OS User's Guide*.

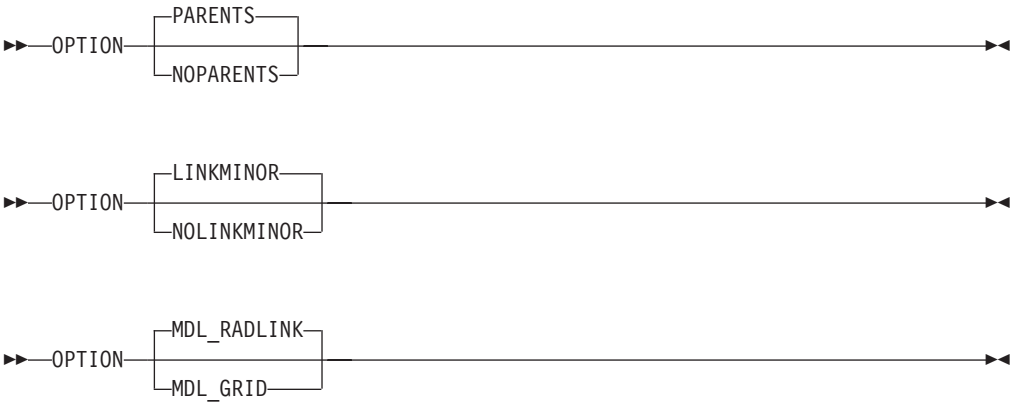
The OPTION Statement

With the OPTION statements you can:

- control whether or not dependencies and major/minor resource relationships are stored in RODM, and are therefore represented on the NMC, and
- specify the default layout for the automatically generated subviews of group objects.

A separate OPTION statement is required for each option.

The OPTION statement has the following format:



The parameters have the following meaning:

PARENTS
Dependency relationships are stored in RODM (and displayed on the NMC in network views). This is the default.

NOPARENTS
Dependency relationships are not stored in RODM.

LINKMINOR
Relationships between major and minor resources are stored in RODM (and displayed in network views). This is the default.

NOLINKMINOR
Relationships between major and minor resources are not stored in RODM.

MDL_RADLINK
The automatically created subviews are radially arranged. This is the default. The default for this option is defined in RODM.

MDI_GRID
The automatically created subviews are arranged in a grid. The default for this option is defined in RODM.

If you want to use the default values, no explicit OPTION statement is required.

The TEMPLATE Statement

The name displayed beneath a resource on the NMC is the DisplayResourceName field of the resource. It can be customized using the TEMPLATE parameter in the INGTOPOF file. The template entries in the INGTOPOF file control how the DisplayResourceName of a resource is formatted.

When using the locate function on the NMC, it is the DisplayResourceName field of the resource that is compared with the search criteria of the locate for an exact match.

It is not a requirement to have any template parameters in the INGTOPOF file. If no template parameter is found in INGTOPOF, the format of the DisplayResourceName will default to the following:

- `PLEX.SYSTEM.TYPE.SUBSYSTEM EVENT` for major resources
- `PLEX.SYSTEM.TYPE.SUBSYSTEM.MINOR EVENT` for minor resources

To change the format of the default DisplayResourceName, special *type* templates are required to specify how the default DisplayResourceName should be formatted. There are the following two types:

- DRN for major resources
- DRNM for minor resources

Customization of the DisplayResourceName can be defined for all resource types (DRN, DRNM), or individually for each resource type (APL, APLM, APG, APGM).

When a resource is created, the type (for example, APL or APG) of the resource is searched for in the INGTOPOF file to find a matching template.

- If a match is found, the DisplayResourceName will be formatted as specified by the type template in the INGTOPOF file.
- If no match is found, the DisplayResourceName will be formatted using the default.

The major resource types supported by the template parameter in the INGTOPOF file are:

APL	applications
APG	application groups
APGP	application groups (sysplex)
SYS	system
SYG	system groups
GRP	groups
MTR	monitor resources

Because minor resources can be attached to major resources, the following types are also supported by the template parameter in the INGTOPOF file for minor resources:

APLM	application minors
APGM	application group minors
APGPM	application group (sysplex) minors

SYSM system minors

SYGM system group minors

GRPM group minors

HEARTBEATM
heartbeat minors

WTORM WTOR minors

TAPEM tape minors

CFM coupling facility minors

CDSM coupled data set minors

ETRM external timer minors

SYSPLEXM sysplex minors

MTRM monitor resource minors

All, any, or none of the above type templates can be used.

When user defined anchors are created, the following applies:

- If the format of the default DisplayResourceName is acceptable, no additional template will be required in the INGTOPOF file. The DisplayResourceName is formatted using the default.
- If you customized the format of the DisplayResourceName, it is necessary to create a template for the user-defined anchors, to specify how the DisplayResourceName must be formatted for the user-defined anchors and any minor resources attached to the user-defined anchors.

If the anchor statement `ANCHOR K1 USER` exists in the INGTOPOF file, define the following two type templates in the INGTOPOF file to control the formatting of the DisplayResourceName for the anchor and any attached minor resources:

- USER for the anchor
- USERM for the minor resources attached to the anchor

To define how the DisplayResourceName is formatted, substitution parameters are employed. Substitution parameters can appear in any order. The following substitution parameters are supported:

&STR. system.type.subsystem

&RES. subsystem/type/system

&MNR. minor resource name (minor resources only)

&SUB. subsystem

&TYP. type

&SYS. system

&EVT. event

&PLX. sysplex

&DATE. date

&TIME. time

If event (&EVT.) is specified as a substitution parameter and no event field exists for the resource, an * is inserted in the DisplayResourceName. If a substitution field does not exist for a resource where a substitution parameter has been specified, then the substitution parameter itself (for example, &SYS. &STR.) will appear in its place in the DisplayResourceName.

Examples

Customizing DisplayResourceName for APLs:

If the requested DisplayResourceName for APLs was system name and subsystem name (for example, SYSX.RODMX), then the following entry would be required in the INGTOPOF file:

```
TEMPLATE APL &SYS..&SUB.
```

Customizing DisplayResourceName for all resources:

If the requested DisplayResourceName for all resources was system name, subsystem name, and event (for example, SYSX.RODMX Event Text), then the following entry would be required in the INGTOPOF file:

```
TEMPLATE DRN &SYS..&SUB. &EVT.
```

Customizing DisplayResourceName for user anchors:

The following anchor statement is found in INGTOPOF file:

```
ANCHOR K1 PLEX1
```

If the requested DisplayResourceName was subsystem, date, and time (for example, RODMX 19 MAY 2002.02:16:45), the following entry would be required in the INGTOPOF file:

```
TEMPLATE PLEX1 &SUB. &DATE..&TIME.
```

The above examples are for major resources. If customization of the DisplayResourceName is also required for minor resources attached to the major resources, then similar template entries in the INGTOPOF file would be required:

- TEMPLATE APLM &SYS..&SUB..&MNR.
- TEMPLATE DRNM &SYS..&SUB..&MNR. &EVT.
- TEMPLATE PLEX1M &SUB..&MNR. &DATE..&TIME.

For an example of the template statements in the INGTOPOF file, refer to “Sample INGTOPOF File” on page 198.

As the DisplayResourceName can now be customized, it is possible to create different resources with the same DisplayResourceName. Although duplicate DisplayResourceNames cause no problems to the NMC or RODM, it will be the responsibility of each installation to ensure that any duplication is correctly processed by any user-written code.

BLDVIEWS creates views containing resources, and can identify resources for inclusion by the MyName field or the DisplayResourceName field of the resource.

- No further change to your BLDVIEWS statements will be required.
- The format of the MyName field may NOT be modified.
- The format of the MyName field is, `PLEX.SUBSYSTEM/TYPE/SYSTEM.MINOR`
- The MyName field may have parts omitted that are not relevant.

- The following are examples of the MyName:

```
PLEX.SUBSYSTEM/TYPE              - major
PLEX.SUBSYSTEM/TYPE/SYSTEM       - major
PLEX.SUBSYSTEM/TYPE.MINOR        - minor
PLEX.SUBSYSTEM/TYPE/SYSTEM.MINOR - minor
```

- If you currently use the DisplayResourceName in your BLDVIEWS statements and you are customizing the DisplayResourceName, it will be necessary to review your BLDVIEWS statements to ensure that the correct resources are included in your views.

The RUNOPID Statement

When submitting commands via the NMC, the commands are run under the user id of the operator signed on to the NMC at that time.

It is possible to select a predefined user id by using the RUNOPID statement in the INGTOPOF file. When a command is submitted via the NMC for a non-local resource, the command will be run under the predefined user id, and not the user id of the operator signed on to the NMC at that time.

Commands that are issued via the NMC against a local resource are never preceded by a label.

Commands that are issued via the NMC against a non-local resource are preceded by a label. This label has three separate fields:

- Netid
- Domain
- User id

Examples of the label are as follows:

- `Netid:`
- `Netid.Domain:`
- `Netid.Domain/User id:`

To provide an amount of flexibility, the RUNOPID statement has been introduced to the INGTOPOF file. This will allow a predefined user id to be used in the label, rather than the user id of the operator signed on to the NMC at that time.

If the RUNOPID statement exists in the INGTOPOF file, then the associated user id will be substituted in the label.

The syntax of the RUNOPID statement in the INGTOPOF file is

```
RUNOPID user id
```

An example of the RUNOPID statement in the INGTOPOF file is

```
RUNOPID ACDMON
```

If multiple RUNOPID statements appear in the INGTOPOF file, then only the first RUNOPID statement will be used, all subsequent RUNOPID statements will be discarded.

The HBDELETE Statement

The HBDELETE statement specifies whether or not old heartbeat entries should be deleted. The default is yes, which provides behavior consistent with earlier releases. The syntax is:

When Y is specified, all previous heartbeat minor resources from the same sysplex are deleted when any heartbeat minor resource from the sysplex is updated. This incurs a measurable resource consumption.

When N is specified, only the update to the heartbeat minor resource is made. This means that RODM may end up containing old (stopped or failed) heartbeats from other systems in the sysplex, long after the heartbeat has been picked up by another system in the sysplex. This is measurably more efficient than the Y option.

The LINKTOVIEWS Statement

The LINKTOVIEWS statement determines which RODM fields will be used to connect major and minor resources within RODM. Specifying BASE or NONE makes processing faster, but at the cost of losing some NMC functionality. The syntax is:

The *resource* parameter may be either a qualified major resource name (sysplex.major), a sysplex name (sysplex) or the constant 'DEFAULT'.

The *linkage* values are:

FULL All links are made, this is the default behavior. Fields linked are:

- IsPartOf/ComposedOfLogical
- ContainedInView
- Aggregationparent
- ExceptionViewList

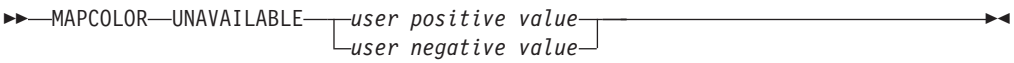
.

BASE The only fields linked are IsPartOf/ComposedOfLogical and AggregationParent. The missing fields mean the minor resource will not appear in any views containing the major resource and will not appear in any exception views containing the major resource (unless placed there by an alternate mechanism such as RCM or BLDVIEWS).

NONE
No links are made, the minor resources will not be accessible from NMC unless picked up by something such as BLDVIEWS or RCM.

The MAPCOLOR Statement

The color for a resource icon of status "Unavailable" can be changed with the keyword "MAPCOLOR". The updated color will be displayed on all NMC topology clients. The syntax is:



It is possible to map the status of "Unavailable" to all "User positive" and "User negative" values. These are:

- User positive: 136 137 138 139 140 141 142 143
- User negative: 152 153 154 155 156 157 158 159

Example:
The default dark green color can be changed to light green by placing the following line in the topology file (INGTOPOF):

```
MAPCOLOR UNAVAILABLE 136
```

On the NMC topology client, the color of each "User positive" or "User negative" value can be displayed and changed with:

Options ► Console properties... ► Status

Technical Note:
Refer to the RODM field DisplayStatus in *Tivoli NetView for z/OS Data Model Reference*.

Note:
The DisplayStatus field has a major impact on the decision whether an object should be placed in an exception view.

Sample INGTOPOF File

```
*********************************************************************
*
* INGTOPOF sample
*
* The sysplex_name in this example is:  K1
* The sysplex consists of the following four
* domains: IPSNM, IPSNN, IPSNO and IPSNP
*
* The KEY1VIEW and CMNVIEW members contain BLDVIEWS control cards.
* They are necessary for the SA topology manager to create 'views'
* in RODM to display SA resources.
* For more details refer to the SA User's Guide,
* Using the NetView Management Console for SA z/OS,
* Creating Views
*
* This sample also contains a user defined anchor 'USER' and
* shows the usage of the 'HBDELETE', 'LINKTOVIEWS', 'OPTION' and
* 'TEMPLATE' statements.
*
```

```
* For a description of all keywords please refer to the
* System Automation for z/OS Planning and Installation guide.
*
* Use a trailing '+' for continuation.
*
*********************************************************************
*
SYSPLEX  K1 IPSNM IPSNN +
                  IPSNO +
                  IPSNP
*
BLDVIEWS K1 KEY1VIEW CMNVIEW
*
ANCHOR K1 USER
*
* HBDELETE N
*  When heartbeat minor resources for the SYSPLEX are updated via the INGPOST
*  command, heartbeat minor resouces will be created on receipt of the initial
*  INGPOST command, these heartbeat minor resources will then be updated for
*  subsequent INGPOSTs commands.
*
* HBDELETE Y
*  When heartbeat minor resources for the SYSPLEX are updated via the INGPOST
*  command, any existing heartbeat minor resources for the SYSPLEX will be deleted
*  and new heartbeat minor resources for the SYSPLEX will be created.
*
* In the following LINKTOVIEWS examples,
* o The sysplex is 'K1',
* o The major resource is 'KEY1/SYS/KEY1'
*
* LINKTOVIEWS DEFAULT FULL
* LINKTOVIEWS K1 BASE
* LINKTOVIEWS K1.KEY1/SYS/KEY1 NONE
*
* OPTION NOPARENTS
* OPTION NOLINKMINOR
OPTION MDL_RADLINK
*
*====================================================================*
* To define how the DisplayResourceName is formatted,               *
* substitution parameters are employed. Substitution                 *
* parameters may appear in any order. The following                  *
* substitution parameters are supported,                             *
*                                                                    *
* &STR. - SYS.TYPE.SUB                                               *
* &RES. - SUB/TYPE/SYS                                               *
* &MNR. - MINOR RESOURCE NAME (Minor Resources only)                 *
* &SUB. - SUBSYSTEM                                                  *
* &TYP. - TYPE                                                       *
* &SYS. - SYSTEM (NULL FOR SYSPLEX RESOURCE)                         *
* &EVT. - EVENT                                                      *
* &PLX. - SYSPLEX                                                    *
* &DATE. - DATE                                                      *
* &TIME. - TIME                                                      *
*                                                                    *
* To activate a TEMPLATE statement remove the leading asterisk from *
* the following samples.                                             *
*====================================================================*
*
*TEMPLATE DRN &PLX..&STR. &EVT.
*TEMPLATE DRNM &PLX..&STR..&MNR. &EVT.
*
*TEMPLATE APL &SYS..&SUB.
*TEMPLATE APLM &MNR.
*
*TEMPLATE APG &PLX. &SYS. &RES.
*TEMPLATE APGM &PLX. &SYS. &RES. &MNR.
```

```
*
*TEMPLATE APGP &PLX. &RES.
*TEMPLATE APGPM &PLX. &RES. &MNR.
*
*TEMPLATE MTR &SYS..&SUB.
*TEMPLATE MTRM &MNR.
*
*TEMPLATE SYS &PLX..&RES.
*TEMPLATE SYSM &PLX..&RES. &MNR.
*
*TEMPLATE SYG &PLX..&RES.
*TEMPLATE SYGM &PLX..&RES. &MNR.
*
*TEMPLATE GRP &RES. GRP
*TEMPLATE GRPM &RES..&MNR. GRPM
*
*TEMPLATE HEARTBEATM &PLX..&RES. &MNR. &EVT. &DATE..&TIME.
*
*TEMPLATE WTORM &MNR. &EVT.
*TEMPLATE TAPEM &MNR. &EVT.
*
*TEMPLATE CFM &PLX..&RES. &MNR. &EVT.
*TEMPLATE CDSM &RES. &MNR. &EVT.
*TEMPLATE ETRM &MNR. &EVT.
*TEMPLATE SYSPLEXM &PLX..&RES..&MNR. &EVT.*
*TEMPLATE USER &STR. &DATE. &TIME
*TEMPLATE USERM &MNR. &PLX. &SUB. &DATE. &TIME. &EVT.
*********************************************************************
```

Appendix C. Miscellaneous Information

This section tells you how to do the additional installation tasks involved in using the enterprise monitoring functions of SA z/OS.

Running Two NetViews on the NMC Focal Point System

If your focal point system runs one NetView for automation (Automation NetView) and another NetView for networking (Networking NetView) that includes an NMC focal point system, you must install SA z/OS on both NetViews. The SA z/OS installation on the NetView used for networking involves only a subset of SA z/OS code, called an SA z/OS satellite, and fewer installation steps are required.

Where the Networking NetView is an enterprise monitoring focal point, the SA z/OS NetView's DSI6INIT Parm should specify the Networking NetView on the same system as its focal point. The focal point needs to receive heartbeats from the SA z/OS domain on the same system to set the necessary RODM focal point fields.

Installation of an SA z/OS satellite is covered as an optional step. See "Step 25: Install an SA z/OS Satellite" on page 138.

Users and RODM Authorization

When RODM is installed on your system, it is necessary to authorize users and applications to access RODM services. This authorization is accomplished using RACF or an equivalent security application. See *Tivoli NetView for z/OS Resource Object Data Manager and GMFHS Programmer's Guide* for details about specifying RODM authorization. This section describes any additional user IDs that must be created for system operations enterprise monitoring and indicates whether they require RODM authorization.

Table 27. RODM Authorization for user IDs

User ID	RODM Authorization Required?
NetView Graphic Monitor Facility operators	No
SA z/OS operators	Yes
User ID for bulk updates from NetView (specified in AOFRODM)	Yes
User ID for GMFHS to connect to RODM (defined when you install GMFHS and RODM)	Yes

Graphic Monitor Facility Host Subsystem (GMFHS) operator IDs are usually created to be the same as NetView operator IDs so that operators can use the same ID and password to log on to GMFHS as they use to log on to NetView. RODM

authorization is not required for use of GMFHS, but the IDs may require authorization for other purposes such as using RODMVIEW.

Note: If you assign an GMFHS operator ID of `OPER1` on the NMC focal point system, GMFHS automatically uses the same GMFHS operator ID on other NetViews within the enterprise as the target for commands.

In addition to logging on to GMFHS, operators using system operations enterprise monitoring need to log on to SA z/OS. You may choose to use the same set of IDs for SA z/OS as you do for NetView and GMFHS. However, SA z/OS IDs must be authorized to RODM. Because an ID can only be used to connect to RODM from one application at a time, you should create a unique system operations ID for each operator who connects to RODM from another application.

Verifying Installation of SA z/OS Satellite (Optional)

You should now test your Networking NetView (with added system operations satellite). An outline procedure for this is:

1. Schedule a testing period. You will require your focal point system and expertise on how the Networking NetView should behave.
2. Shut down your Networking NetView. This means you no longer have any network automation.
3. Start your Networking NetView with the SA z/OS satellite.
4. Check that it initializes without error.
5. Check that your Networking NetView still works.
6. Start the NetView with the satellite installed and the SA z/OS topology manager configured. At this point, the SA z/OS topology manager should automatically contact all defined target sysplexes, retrieve their configuration information and create corresponding objects within RODM. Finally it will run the BLDVIEWS statements that you have defined for each sysplex. These will create views within RODM allowing you to see the objects created by the SA z/OS topology manager.
7. Start an NMC server connected to the focal point system and then connect to it from an NMC client. You should see the views defined by your BLDVIEW statements. These should contain objects representing the automated resources on the target sysplexes. There should be a green heartbeat icon for each active target sysplex.
8. If you select an icon representing an automated resource and right-click, you should see SA z/OS commands on its context menu. Select INGINFO and see that the command is issued properly.
9. Shut down the new Networking NetView, bring up the former one, and plan for production cutover.

Enabling SA z/OS Support for Extended Multiple Console Support (EMCS)

This section describes how to set up extended multiple console support and also describes EMCS's restrictions and limitations.

Note: EMCS support is mandatory for the successful operation of SA z/OS.

Setting Up EMCS

- Assign each CSSIR task a unique TSKID name within the sysplex. To do this, specify a unique name for SSIname in the CNMSTYLE member that resides in the DSIPARM data set.
- Update the synonym %AOFSIRTASK%, in member AOFMSGSY, to reflect the new name of the NetView CNMCSSIR task.
- Code MSGIFAC=SYSTEM on both the NetView task (in DSIDMNK) and the SSI task (in the procedure itself).
- Add the AOCGETCN command to the initial CLIST of your operator profiles.
- Switch on the SA z/OS global variable AOF_EMCS_AUTOTASK_ASSIGNMENT, to assign an autotask to EMCS consoles.

Note: For NetView 5.1 and above DSIDMNK entries have been moved to CNMSTYLE.

EMCS Restrictions and Limitations

- You must code MSGIFAC=SYSTEM on both the NetView and SSI tasks.
- There must be only one NetView running SA z/OS in each machine.
- Do not:
  - Use route codes to route messages to any NetView task console
  - Deactivate the action message retention facility (AMRF) (by coding COM='K M,AMRF=N' in the COMMNDxx member of SYS1.PARMLIB)
  - Change the MSCOPE setting on the xxxCSSIR task/console
  - Define the AUTO attribute for any NetView task/console under the RACF OPERPARMS
  - Define a SAF OPERPARM definition for extended MCS console authority to anything other than MASTER

Violation of these restrictions will cause unpredictable results.

Appendix D. Processor Operations Sample

This section provides a sample how to use processor operations for a NetView connection:

Host VTAM Definitions for a NetView Connection through an OSA Adapter

Channel attached Major node:

```
*=====================================================================*
*    VTAM XCA MAJNODE OVER OSA                                        *
*=====================================================================*
IPSLXCA1 VBUILD TYPE=XCA
IPSLPCA1 PORT  ADAPNO=1,                                              +
               CUADDR=110E,                                           +
               MEDIUM=RING,                                           +
               SAPADDR=04,                                            +
               TIMER=60
*** ________________________________________________________________
***
IPSLXTG1 GROUP DIAL=YES,                                              +
               DYNPU=YES,                                             +
               DYNPUPFX=PX,                                           +
               ANSWER=ON,                                             +
               AUTOGEN=(16,L,P),                                      +
               CALL=INOUT,                                            +
               ISTATUS=ACTIVE
```

Switched Major Node for a processor operations support element (SE)

```
*=====================================================================*
*    VTAM SW MAJNODE                                                  *
*=====================================================================*
***
IPSLSWN2 VBUILD TYPE=SWNET,MAXNO=1,MAXGRP=1
*** ________________________________________________________________
***

IPSL1T00 PU    ADDR=C1,                                               +
               IDBLK=05D,                                             +
               IDNUM=E0000,                                           +
               CPNAME=IPSL1T00,                                       +
               MAXOUT=7,                                              +
               MAXPATH=1,                                             +
               MAXDATA=265,                                           +
               PUTYPE=2,                                              +
               DISCNT=NO,                                             +
               VPACING=0,                                             +
               PACING=0,                                              +
               IRETRY=YES,                                            +
               PASSLIM=1,                                             +
               ISTATUS=ACTIVE,                                        +
               MODETAB=AMODETAB,                                      +
               DLOGMOD=D4A32782,                                      +
               USSTAB=USSCP,                                          +
               SSCPFM=USSSCS
IPSLT0   PATH  DIALNO=010400203529D9CC,GRPNM=IPSLXTG1,CALL=INOUT
*** ________________________________________________________________
***
IPSLT000 LU    LOCADDR=0,DLOGMOD=#INTER               ProcOps localLU
```

processor operations sample

```
*** ____________________________________________________________________
***
IPSL1T01 PU    ADDR=C1,                                                 +
               IDBLK=05D,                                               +
               IDNUM=D0000,                                             +
               CPNAME=IPSL1T01,                                         +
               MAXOUT=7,                                                +
               MAXPATH=1,                                               +
               MAXDATA=265,                                             +
               PUTYPE=2,                                                +
               DISCNT=NO,                                               +
               VPACING=0,                                               +
               PACING=0,                                                +
               IRETRY=YES,                                              +
               PASSLIM=1,                                               +
               ISTATUS=ACTIVE,                                          +
               MODETAB=SNAMODET,                                        +
               DLOGMOD=D4A3278A,                                        +
               USSTAB=USSCP,                                            +
               SSCPFM=USSSCS
IPSLT1   PATH  DIALNO=010400203529D9CC,GRPNM=IPSLXTG1,CALL=INOUT
*** ____________________________________________________________________
***
IPSMT100 LU    LOCADDR=0,MODETAB=MTLU6,DLOGMOD=#INTER   Support Element
IPSMT101 LU    LOCADDR=2                                3270 SESSION
IPSMT102 LU    LOCADDR=3                                3270 SESSION
```

Appendix E. Migration Information

This appendix provides information about aspects of migration from earlier releases.

Migrating to SA z/OS 3.1

This section describes actions you must take to migrate to SA z/OS 3.1. Migration is described as a multistep process:

1. First the steps to migrate from SA z/OS 2.3 to SA z/OS 3.1 are described (see "Migrating to SA z/OS 3.1 from SA z/OS 2.3")
2. Then the steps you will need to make to migrate from SA OS/390 2.2 to SA z/OS 2.3 (see "Migrating to SA z/OS 2.3 from SA OS/390 2.2" on page 215)
3. Finally the steps that are required to migrate from SA OS/390 2.1 to SA OS/390 2.2 (see "Migrating to SA OS/390 2.2 from SA OS/390 2.1" on page 217)

Thus, for example, if you want to migrate from SA OS/390 2.1 to SA z/OS 3.1, you will need to perform all three steps, migrating first to SA OS/390 2.2, then to SA z/OS 2.3, and finally to SA z/OS 3.1.

Migrating to SA z/OS 3.1 from SA z/OS 2.3

The following steps are required to migrate to SA z/OS 3.1.

Policy Database Migration

Entry type ICL, which has not been actively supported since V2R1, is now no longer available.

The information that was stored in entry type DEN needs to be manually migrated. It now needs to be stored in the DB2 CONTROL policy item of APL policy objects that have an application type of DB2.

The SAF ENVIRON policy item in entry type NTW is no longer supported. The information that was stored in there now needs to be stored in entry type UET. To migrate it, you can exploit the *Migrate from ACF* option in the *Data Management* option of the V3R1 customization dialog (see *IBM Tivoli System Automation for z/OS Defining Automation Policy* for details). This will now automatically place the SAF ENVIRON information in entry type UET.

ACF Migration

SA z/OS 3.1 requires the automation control file and the associated automation manager configuration file to be consistent and to be built from the policy database in one step.

Step 1. Make a copy of your V2R*n* policy database.

Step 2. Edit that copy with the V3R1 customization dialog. This will convert it to V3R1 format.

> **Note:**
> Any information in entry types ICL or DEN or in policy item SAF ENVIRON of entry type NTW will be discarded. So if required by your environment, make sure you migrate it as described in "Policy Database Migration" on page 207.

Step 3. If you have OMEGAMON installed and you want to integrate monitoring information and exceptions with SA z/OS V3.1, define AOFSESxx automated functions mapped to AUTSESxx automation operators in entry type AOP. The AUTSESxx automation operators must be defined in the NetView DSIOPF PARMLIB member.

Step 4. For automated functions named MVSCONS*i* in entry type AOP, the MVS console ID specification is no longer available. Supply an MVS console name instead.

> **Note:**
> If you have any pre-V3R1 automation agents coexistent with V3R1, the MVSCONS*i* automated functions that have been defined for them must now also use MVS console names instead of MVS console IDs.

Step 5. Build the system operations configuration files (automation control file, automation manager configuration file, NetView Automation Tables, and MPFLST member) from the customization dialog. For more information, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Automation Status File

The layout of the automation status file has changed. Therefore:

- If you need not preserve any information that is currently in your V2R3 automation status file, simply delete it and allocate a fresh automation status file with the V3R1 layout by running sample job INGALLC2 as described in "Step 2b: Data Sets for Automation Agents" on page 87.
- If, however, you need to preserve the information that is currently in your V2R3 automation status file, proceed as follows:
  1. Make a backup copy of your V2R3 automation status file.
  2. Delete the original data set.
  3. Reallocate a data set for the automation status file by running sample job INGALLC2 as described in "Step 2b: Data Sets for Automation Agents" on page 87. This will use the new layout.
  4. Use the AOFEXASF migration utility that is shipped with SA z/OS 3.1 to copy the status information from the backup copy of your V2R3 automation status file to the newly allocated V3R1 automation status file.

Automation Table Migration

The predefined automation table fragment INGMSG02 is no longer shipped. Therefore, you need to change the AT scope to ENTERPRISE and then run a SysOps build with MODIFIED in the TYPE build option field (see *IBM Tivoli System Automation for z/OS Defining Automation Policy* for how to run a SysOps build).

DB2 Automation: Critical Event Monitoring

Critical event monitoring in DB2 automation handles specific critical events that may occur during normal day to day running of DB2. In SA z/OS 3.1, the processing of some DB2 messages has been moved from special DB2 automation routines to generic routine ISSUECMD. This provides more flexibility in customizing the DB2 automation.

- The relating automation table statements for triggering the automation actions by incoming messages can now be overridden.
- Some of the DB2 messages can now be automated even if DB2 is not defined as an application of DB2.
- Automation table statements to the relating messages are only created when commands to be issued are defined in the automation policy.

In the following, the changes in the automation of the concerned DB2 messages are described in detail.

- **DSNP007I — Dataset extension failed**
  DSNT500I — Resource unavailable
  DSNT501I — Resource unavailable

Situation in V2R3:

In SA z/OS 2.3, specific DB2 routines have been triggered by each of these messages via an appropriate entry in the automation table INGMSG02. The DB2 routines used code specifications to message ID DATABASE in policy item MESSAGES/USER DATA of the DB2 entry or MVSESA to check, if the code definitions matched the triggering message. The code definitions of the automation control file have been silently completed by database IDs DSNDB01 and DSNDB06. If a match has been found for a code specification with value returned NULL and the message has been issued by a BATCH job, the defined commands to the message ID of the triggering message has been issued. For non BATCH jobs, only an alert has been issued.

Changes in V3R1:

In SA z/OS 3.1, ISSUECMD is called instead of the DB2 specific routines. The standard generic routine is smart enough to provide all functionality for processing these messages. For a greater granularity the code specifications are expected to be defined to the message ID of the triggering message instead of message ID DATABASE. In SA z/OS 3.1, ISSUECMD is called with code specifications as parameters. The code values are extracted from the message text. In case of message DSNP007I the data set name is passed as CODE1, the return code is passed as CODE2 and the connection ID is passed as CODE3 value. In case of message DSNT500I or DSNT501I the name is passed as CODE1, the reason is passed as CODE2 and the type is passed as CODE3. If a match is found to the ID of the triggering message in policy item MESSAGES/USER DATA, the returned value is used to select and issue the relating commands defined in the automation policy.

Migration:

To migrate the automation processing of these messages from SA z/OS 2.3 to SA z/OS 3.1 unchanged as far as possible, copy the code definitions with NULL as returned value from message ID DATABASE to the relating message IDs. Adapt the code definitions to the code values passed as parameters when calling ISSUECMD in the automation table by:

1. Specifying connection ID BATCH as value to CODE3 (only for message DSNP007I)
2. Adding code definitions for database IDs DSNDB01 and DSNDB06
3. Adding an asterisk (*) as wild character at the beginning and/or end of the code values, if they do not represent the appropriate whole extracted value of the message text

Add the returned value to the code specifications as selection name to the commands defined to the relating message ID in the automation control file, if the commands should only be issued, if a code match occurs. If you still have a down level system in your installation, where you do not use easy message management, you have to keep the old definitions to message ID DATABASE in the automation policy, which you have copied to the message IDs of the triggering messages. Otherwise you can delete them.

- **DSNV086E — Final termination message**

Situation in V2R3:

In SA z/OS 2.3, automation table INGMSG02 contained several statements to the final termination message DSNV086E of DB2. Dependent on the reason code included in the message text, the status of DB2 has been changed to BROKEN or ABENDED by calling the generic routine TERMMSG with parameters FINAL=YES and BREAK=YES or ABEND=YES. In additional automation table statements labelled with INGDB2, the special DB2 routine INGRDTTH has been called in addition to generic routine TERMMSG.

Changes in V3R1:

In SA z/OS 3.1, the checking of the reason code in the message text has been moved from the automation table to code specifications in the automation policy. This allows you a more flexible customization of these definitions without having the need to override the relating automation table statements. In SA z/OS 3.1, the automation table statement calls the generic routine TERMMSG with parameter FINAL=YES and with code specifications, which are used to search the automation control file for an action that modifies the BREAK or ABEND parameter. Furthermore, the special DB2 routine INGRDTTH is called by TERMMSG itself, if the application having issued the triggering message is known to SA as application of subtype DB2.

Migration:
To migrate the functionality of the automation table statements of SA z/OS 2.3 unchanged to SA z/OS 3.1, define the following code specifications to message ID DSNV086E in policy item MESSAGES/USER DATA of entry DB2 or MVSESA in the policy database:

Table 28.

Code1	Code2	Code3	Value Returned
jobname	00F70600	*	BROKEN
jobname	00F70602	*	BROKEN
jobname	00E30105	*	BROKEN
jobname	00E30078	*	BROKEN
jobname	*	*	ABENDED

Code1 specifies the job name of DB2 which issues message DSNV086E and code2 specifies the reason code, included in the message text. Code3 is not used.

- **DSNJ002I — Switch active log data sets**

Situation in V2R3:
In SA z/OS 2.3, specific DB2 routine INGRD002 had been triggered by message DSNJ002I via an appropriate entry in the automation table INGMSG02. The DB2 routine tracked the occurrence of message DSNJ002I for the log dataset specified by the “Active log data set name” in the DB2 CONTROL policy item. The routine issued a command when a critical threshold was reached. The command to be issued had to be defined in the automation policy item MESSAGES/USER DATA of the DB2 resource entry to message DSNJ002I. The threshold had to be entered against the LOG minor resource for the DB2 resource.

Changes in V3R1:
In SA z/OS 3.1, generic routine ISSUECMD is called instead of the DB2 specific routine. ISSUECMD does not check the occurrence of the triggering message DSNJ002I. The command defined in the automation policy is issued each time, when it is triggered by message DSNJ002I for the log data set specified by the “Active log data set name” in the DB2 CONTROL policy item. Message ING115A is no longer issued.

- **DSNJ110E — Last active log data set is % full**

Situation in V2R3:
In SA z/OS 2.3, specific DB2 routine INGRD111 had been triggered by message DSNJ110E via an appropriate entry in the automation table INGMSG02. The DB2 routine compared the reported percentage full figure of the triggering message with the critical threshold defined in the "Log full threshold" field of the DB2 CONTROL policy item. If the value in the message exceeded this threshold, automation proceeded to issue the command defined in the automation policy item MESSAGES/USER DATA of the DB2 resource entry to message DSNJ110E with selection CRIT.

Changes in V3R1:
In SA z/OS 3.1, generic routine ISSUECMD is called instead of the DB2 specific routine and the command from the ACF is called without selection name.

Migration:
To migrate this functionality of SA z/OS 2.3 unchanged to SA z/OS 3.1, delete the selection name of the command, defined to message DSNJ110E in the policy item MESSAGES/USER DATA of the DB2 policy object.

- **DSNJ111E — All active log data sets full**

Situation in V2R3:
In SA z/OS 2.3, specific DB2 routine INGRD111 had been triggered by message DSNJ111E via an appropriate entry in the automation table INGMSG02. The DB2 routine issued message ING116I when the elapsed time interval since the last received message DSNJ111E has been greater than the value defined in the "Active log alerts" field of the DB2 CONTROL policy item. If furthermore the occurrence of the received DSNJ111E messages exceeded the defined threshold, automation proceeded to issue the command defined in the automation policy item MESSAGES/USER DATA of the DB2 resource entry to message DSNJ111E with selection CRIT.

Changes in V3R1:
In SA z/OS 3.1, generic routine ISSUECMD is called instead of the DB2 specific routine and the command from the ACF is called without selection name. Message ING116I is no longer issued.

Migration:
To migrate the functionality of SA z/OS 2.3 unchanged to SA z/OS 3.1, delete the selection name of the command, defined to message DSNJ111E in the policy item MESSAGES/USER DATA of the DB2 policy object.

- **DSNJ115I — Archive data set could not be allocated**

Situation in V2R3:
In SA z/OS 2.3, specific DB2 routine INGRD115 had been triggered by message DSNJ115I via an appropriate entry in the automation table INGMSG02. The DB2 routine issued message ING117I when the elapsed time interval since the last received message DSNJ115I has been greater than the value defined in the "Log offload interval" field of the DB2 CONTROL policy item. In addition automation issued the command defined in the automation policy item MESSAGES/USER DATA of the DB2 resourc entry to message DSNJ115I with selection CRIT.

Changes in V3R1:
In SA z/OS 3.1, generic routine ISSUECMD is called instead of the DB2 specific routine and the command from the ACF is called without selection name. Message ING117I is no longer issued.

Migration:
To migrate the functionality of SA z/OS 2.3 unchanged to SA z/OS 3.1, delete the selection name of the command, defined to message DSNJ115I in the policy item MESSAGES/USER DATA of the DB2 policy object.

- **DSN*nnnn*E — Generic alert**

Situation in V2R3:
In SA z/OS 2.3, specific DB2 routine INGRDREC has been triggered by messages DSNnnnnE via an appropriate entry in the automation table INGMSG02. The DB2 routine tracked the occurrence of incoming messages and issued either a command or a reply when a critical threshold was reached. The command to be issued had to be defined in the automation policy item MESSAGES/USER DATA of the DB2 resource entry to the relating message. The threshold had to be entered against the minor resource for the DB2 resource. The incoming messages had been captured.

Changes in V3R1:
In SA z/OS 3.1, generic routine ISSUECMD or ISSUEREP is called instead of the DB2 specific routine. ISSUECMD or ISSUEREP does not check the occurrence of the triggering message DSNJ002I. The command or reply defined in the automation policy is issued each time, when it is triggered by the relating message.

Migration:
If messages DSN*nnnn*S have to be captured even if they are not automated, define them in policy item MESSAGES/USER DATA and select "Capture" as the AT action.

IMS Automation: Define Restart Commands in Response to Message DFS810A

In SA z/OS 2.x automation table INGMSG02 included an entry for message DFS810A belonging to label group INGIMS and issuing the commands OUTREP and EVIEI00B. This statement had the effect that the automation issued a reply to an incoming DFS810A message, as defined in automation policy MESSAGES/USER DATA of the related application, selecting the reply to the start type as selection name. In the case of start type MANUAL, the value provided in input field Appl Parms of the INGREQ command, was given as the response to DFS810A.

In SA z/OS 3.1 an automation table entry for message DFS810A is only built if a reply to this message is defined in policy item MESSAGES/USER DATA to any application in the automation policy. The automation table statement that is created issues thegeneric routine ISSUEREP in response to the incoming DFS810A message. The standard ISSUEREP routine does not handle the start type MANUAL differently compared with the other start types. This means that the response to DFS810A for start type MANUAL is also taken from the policy item MESSAGES/USER DATA, using MANUAL as the selection name.

A new variable, &APPLPARMS, provides the value defined as Appl Parms in the INGREQ command and can be used when specifying commands and replies in the automation policy in response to incoming messages during the startup phase. For compatibility reasons variable &EHKVAR1 can still be used instead of &APPLPARMS.

To migrate to SA z/OS 3.1, define the replies to DFS810A for each start type as the selection name in policy item MESSAGES/USER DATA. If in case of start type MANUAL the value specified in Appl Parms of the INGREQ command has to be issued as response to DFS810A, define &APPLPARMS as the command to selection name MANUAL.

If policy item MESSAGES/USER DATA does not contain any definitions to message ID DFS810A, no automation table entry for this message will be included in the automation table that is automatically built.

Equivalents to Retired Commands

Table 29.

Command Retired in V3R1	Equivalent
CICSDLY	MDFYSHUT
CICSPOST	INGEVENT
EVEED003	AOFCPMSG
EVEEMIGR	—
EVIED003	AOFCPMSG
EVJSESHUT	INGREQ RESTART=YES
GWTRACE	—
IMSPOST	INGEVENT
INGHC	—
INGPW	GETPW
OPCSRST	SRSTAT
UPDPW	—

Coupling Facility Structures

When you no longer have any previous releases coexisting with SA z/OS 3.1, you can remove the ING_HEALTHCHKLOG structure from the CFRM policy. SA z/OS 3.1 only requires the HSA_LOG structure (see "Step 12: Customizing the System Logger" on page 117).

Incompatibilities

Be aware of the following incompatibilities when carrying out migration:

- The ASF command requires the DATE to be specified with a 4-digit year, for example:

  ```
  ASF  REQ=REPL,ID=resource,DATE=mm/dd/yyyy
  ```

- The following messages return the date in the `mm/dd/yyyy` format instead of `mm/dd/yy`:
  - AOF156I
  - AOF157I
  - AOF161I
- Message AOF150I (`STATISTICS DISPLAY REQUESTED FOR` *`from_resource`* `THRU` *`to_resource`*) is issued even when *from_resource* happens to equal *to_resource*.
- Message AOF151I (`ID=` *`resource`*`, TYPE=` *`type`*`, STATUS=` *`status`*) includes the TYPE and STATUS keywords both when issued by the ASF command and when issued by the ASFUSER command. For the ASFUSER command, however, the TYPE and STATUS fields are blank
- The trigger and schedule columns are not longer shown in the DISPSTAT command output.
- The EVIEX002 and EVIEX003 commands no longer support the following fields:
  - SERVSTARTDT
  - SERVENDDT
  - STARTOPT
  - STARTTYPE
- The CICS autotask logon feature is no longer supported.
- The AOFEXSTA exit is no longer invoked for WTOR reply handling and SDF updates.
- The following message IDs (Message/User data Policy) are reserved for SA z/OS usage:
  - VTAMDN
  - VTAMUP
- CICS VTAM ACB recovery has been removed.

Migrating to SA z/OS 2.3 from SA OS/390 2.2

Note:
SA z/OS 2.3 does not accept manually edited automation control files.

The following steps are required to migrate to SA z/OS 2.3.

ACF Migration

SA z/OS 2.3 requires that the automation control file and the associated automation manager configuration file are consistent and built from the policy database in one step.

1. Take a copy of the current policy database.
2. Edit the policy database with the customization dialog. This will convert it to the SA z/OS 2.3 format.
3. Define the HBOPER, POSTOPER, and POSTSLV auto operators.
4. Build the system operations configuration files (automation control file, automation manager configuration file, NetView Automation Tables, and MPFLST member) from the customization dialog. For more information, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.
5. The structure of the ProcOps control file (**.ISQCNTL) has changed. Therefore it must be built anew even if the configuration as such stays the same.

Automation Manager Migration

Carry out the following steps:

1. Specify the BLOCKOMVS=YES option in HSAPRMxx member.
2. Modify the automation manager startup procedure:
   a. Remove the DD-statement for the Takeover file (HSATKOVR)
3. Specify the TAKEOVERFILE= parameter in HSAPRM*xx* member.

NMC Migration

Carry out the following steps:

1. Define the NMC focal point and Backup in the policy database.
2. Define Anchors in the policy database. They are no longer in the TOPO file.

Incompatibilities

Be aware of the following incompatibilities when carrying out your migration:

- ACTIVMSG, HALTMSG and TERMMSG
  - If the generic routines are called with parameter MSGTYPE, the commands associated with the ENTRY-TYPE pair of MSGTYPE are issued *in addition* to the commands associated with the ENTRY-TYPE pair of the status that the application is placed into.
- Status commands are issued each time an application is placed into the specified status, regardless of how the status change occurred.
  - SA z/OS can now additionally react to status changes to RESTART, STARTED or AUTOTERM
  - SA z/OS can now react if the status of an application is changed to ACTIV or EXTSTART by AOFRSMOP and not by ACTIVMSG.
- INGPOST command:
  - Support for SCOPE, MAJRESNAME, MAJRESTYPE, MINRESNAME, MINRESTYPE and FROMPLEX parameters has been dropped
- Changed defaults for AAOs:
  - AOFSMARTMAT default changed from 0 to 2
  - AOFQUICKWTOR default changed from 0 to 1
  - AOFRESTARTALWAYS default changed from 1 to 0
- AAO AOFSENDGMFHSREQUEST has been retired
  - It has been replaced by AOFUPDRODM= YES
- AAO AOFCAPMSGLIM has been retired:

  - The maximum number of messages to be captured is now specified in the customization dialog when defining an application. The default is 0
- AAO AOFMINORCHK has been retired
- JES3 special monitoring has been retired and replaced by monitor resources (MTRs).
- The sysplex group name cannot be more than 8 characters in length because it is used as the TARGET= parameter.
- NNT sessions are no longer supported.
- SDF status forwarding via intermediate node is no longer supported:
  - This must be changed to a direct connection to the focal point.

Migrating to SA OS/390 2.2 from SA OS/390 2.1

Note:
SA OS/390 2.2 does not accept manually edited automation control files.

The following steps are required to migrate to SA OS/390 2.2.

ACF Migration

SA z/OS 2.3 requires that the automation control file and the associated automation manager configuration file are consistent and built from the policy database in one step.

1. Migrate any user include files into the current policy database. For details, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.
2. Change AT AOFMSG01 to INGMSG01 in the AUTOMATION SETUP of system policy object.

NMC Migration

Delete the following files on the NMC Topology Server:

```
files            directory
----------       --------------------
ING_NMCC_*.DDF   \usr\local\Tivoli\bin\w32-ix86\tds\server\config\ddf\
ISQ_NMCC_*.DDF   \usr\local\Tivoli\bin\w32-ix86\tds\server\config\ddf\
ING_NMCC_*.HTML  \usr\local\Tivoli\bin\w32-ix86\tds\server\db\current\help\
ISQ_NMCC_*.HTML  \usr\local\Tivoli\bin\w32-ix86\tds\server\db\current\help\
```

The following files used in SA OS/390 2.1 are replaced by files shipped with SA OS/390 2.2:

```
INGNMCJDial.jar
ING_NMCS_CMD.RSP
ISQ_NMCS_CMD.RSP
```

The files have identical names in both releases.

To apply the new response files for SA OS/390 2.2, use the same method that you use for installing fixes.

Coexistence of SA z/OS 3.1 with Previous Releases

It is not expected that you will cut over all your systems at the same time from previous releases to SA z/OS 3.1. This means that you may be running different releases at the same time.

Note: For coexistence SA z/OS 3.1 with previous releases, APAR OA10946 must be installed.

The following outlines the support that SA z/OS provides for such an environment:

- You do *not* need to maintain different versions of the policy database. Instead, the SA z/OS 3.1 customization dialog can be used to maintain the policy database. The ACF built by the V3R1 customization dialog can be used by a downlevel SA z/OS release that has APAR OA10946 installed, but only when no new SA z/OS 3.1 function has been selected.
- SA z/OS 3.1 systems can coexist with SA z/OS 2.3 and SA OS/390 2.2 systems within the same sysplex. Figure 28 illustrates this: it shows a sysplex with three automated systems and a separate automation manager (and its secondary).

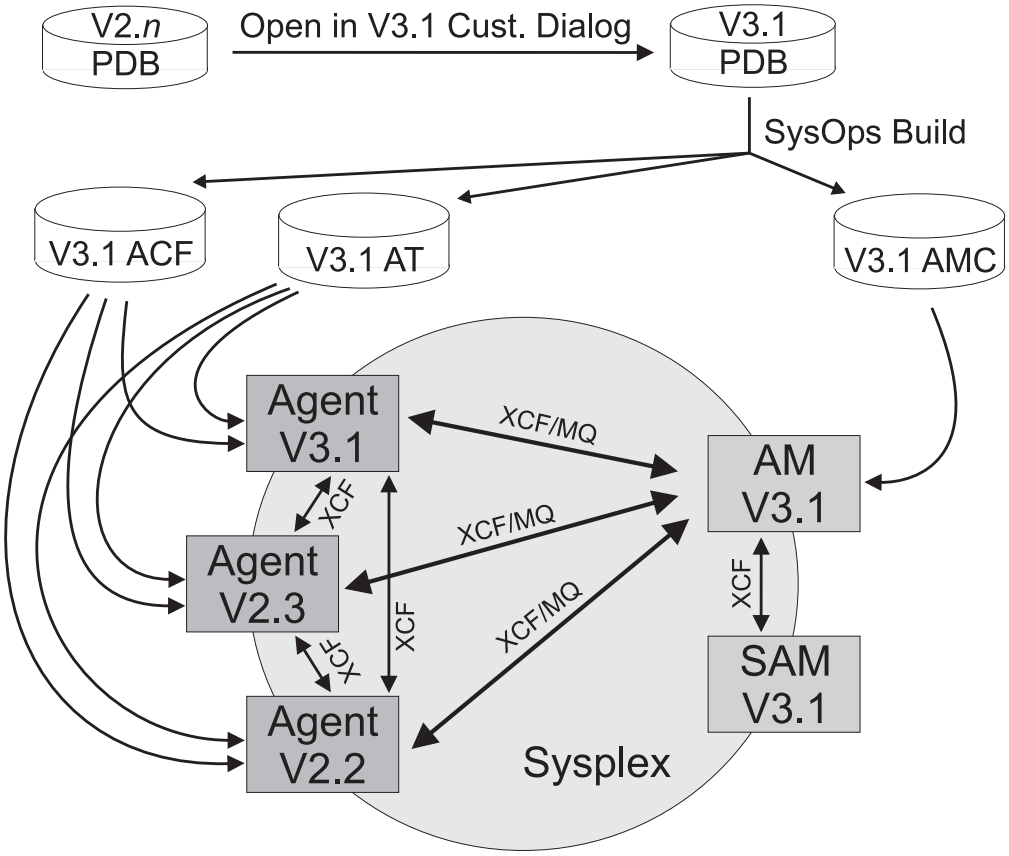


Figure 28. Coexistence of SA OS/390 2.2, SA z/OS 2.3, and SA z/OS 3.1

Any policy database created by a downlevel version of the customization dialog (that is, earlier than SA z/OS 3.1) is automatically converted into the SA z/OS 3.1 format when the policy database is opened the first time using the SA z/OS 3.1 customization dialog.

The ACF built by the SA z/OS 3.1 customization dialog can be used by any automation agent running either SA z/OS 3.1, SA z/OS 2.3 or SA OS/390 2.2. In other words, the ACF fragments that are built are compatible, so they can be used by any agent running a downlevel version of SA z/OS.

The NetView automation table (AT) created by the SA z/OS 3.1 customization dialog can be used by agents of any release.

Within a sysplex (that is, the same XCF group) automation agents running SA OS/390 2.2, SA z/OS 2.3 or SA z/OS 3.1 can communicate with an SA z/OS 3.1 automation manager. The communication is either via XCF or WebSphere MQ. The automation agents communicate with each other by means of XCF.

Coexistence of the Takeover File

The format of the takeover file is compatible between the various releases of SA z/OS. For example, the takeover file processed by an SA z/OS 3.1 automation manager can be read by an SA z/OS 2.3 automation manager when a PAM switch occurs.

Coexistence of the Agent and Automation Manager

An SA z/OS 3.1 automation agent can communicate with an SA z/OS 3.1, SA z/OS 2.3, and SA OS/390 2.2 automation manager.

Migrating to SA z/OS 3.1 from msys for Operations

If you are using msys for Operations and you are going to migrate to SA z/OS 3.1, you may migrate system by system. The msys for Operations functions will cooperate with SA z/OS 3.1 if the same XCF group ID is used. You can achieve this by setting GRPID in the INGXINIT member (for the automation agents) and in HSAPRM*xx* (for the automation manager) to `A0` ('A', zero) during the migration phase.

To migrate from msys for Operations to SA z/OS 3.1, you must perform the following steps:

1. Log on to msys for Operations and use the command INGCUST to migrate the entries of member AOFCUST to ACF fragments. Refer to "INGCUST" on page 220 for details.
2. Use the SA z/OS customization dialog to create a new policy database by selecting a sample database as a model (sample EMPTY is recommended). For detailed information, refer to the chapter that describes how to use the customization dialog in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.
3. Use the MIGRATE function of the SA z/OS customization dialog to add the automation definitions to the policy database. For details, refer to "Migration Functions" in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

   On the System Migration Definitions panel (AOFGMSYN), enter the *pds_library_name* you specified in INGCUST and member ACFZ999. MVS Sysname must be the name of a system in the sysplex. See Figure 29 on page 220 for an example.

```
  MENU  OPTIONS  HELP
 ------------------------------------------------------------------------------
AOFGMSYN                 System Migration Definitions
Option ===> 2

  1 Select Migration Objects
  2 Start Online Migration
  3 Start Batch Migration
  4 View Migration Report

Source definitions:
  Dataset & member. . 'key1.msysops.acf(acfz999)'

Target definitions:
  PolicyDB name     : MSYSOPERATIONS
  Dataset name      : 'KEY1.MSYSOPS.PDB'
  Report member . . . $RPTMIG              Member name in target data set
  Overwrite system. . NO                   YES NO
  System Entry Name . KEY1_system          Entry Name of new/changed system
  MVS Sysname . . . . key1                 MVS System Name
  Short Description . key1 system
```

Figure 29. System Migration Definitions Panel

Start processing the migration.

4. After having migrated one system with the migration function, you must now create the other systems of the sysplex (use entry type SYS of the customization dialog), and copy all entries from the migrated system to the new defined systems by using policy item COPY.
5. Make sure that all systems are linked to the sysplex group.
6. Customize your SA z/OS according to your requirements.

INGCUST

INGCUST is a service function that you can use on the systems where you have been using msys for Operations to migrate from msys for Operations to the licensed version of System Automation for z/OS. It converts the sections of AOFCUST to ACF fragments that must be stored in a PDS library.

Specify INGCUST with the partitioned data set (PDS) name, where the ACF fragments will be stored.

pds_library_name must be allocated with a fixed-block format (RECFM=FB), and a logical record length of 80 (LRECL=80). It also requires 3 directory blocks and 2 tracks.

The ACF fragments will be built and stored as PDS members within *pds_library_name*.

Note: The NetView operator must have write-access to this partitioned data set.

Appendix F. Syntax for HSAPRM00

Notes:

1. A sample member called HSAPRM00 is provided in the SINGSAMP sample library.
2. Records starting with a '*' in column 1 are treated as comments. Each parameter must be specified on a single line. Trailing comments are not supported.

```
BUILDTIMEOUT={ss | 180}
CFGDSN=<configuration file data set name>
COMM={XCF | MQ}
DELAY={ss | 0}
DIAGINFO=dsname
DIAGDUPMSG={nnnnn | 0}
GRPID={xx | '  '}
LEOPT={<any>}
LOGSTREAM={YES | NO}
MQM=ssid
NUMQTHDS={n | 3}
OVRDELETEDELAY={dd | 0}
PREF=number
PROMPT={YES | NO}
START={COLD | HOT | WARM}
STOPDELAY={ss | 30}
TAKEOVERFILE=name
TAKEOVERTIMEOUT=nn
```

BUILDTIMEOUT

May be used to specify a time limit for the completion of the data structure build process as used during COLD or WARM start of the primary automation manager. A value from 0-999 seconds may be specified, and a value of 180 (3 minutes) will be assumed if omitted. A specification of 0 suppresses timing of the data structure build process.

CFGDSN

The CFGDSN value will be used only on a COLD start, and may be overridden by an initialization prompt response. On other start types, the default CFGDSN will be the one that was in use when automation was last active.

COMM

This parameter specifies how communication between the automation manager and the automation agents is realized. The possible values are:

XCF Specifies that the automation manager will use XCF for communication with the automation agents. In this case, the takeover file provides the persistent storage medium for holding the current resource states and settings across automation manager sessions.

Using XCF for communication has the following risks:

- All workitems travelling to, queued in, or processed by the automation manager are lost when the automation manager terminates abnormally.
- Orders for the automation agents can be broken because some orders could already have been sent at the time when the automation manager terminated abnormally.

- A warmstart is required when an irrecoverable I/O error occurs while reading from or writing to the takeover file.

MQ This is the recommended option. It specifies that the automation manager will use MQSeries for communication with the automation agents, and also for holding the status information. With this option, the information in the header of the takeover file determines whether MQSeries or the takeover file is used for a HOT start or takeover.

The COMM parameter and the MQ parameter are mutually dependent. When you specify `COMM=XCF`, the MQ parameter must be left blank. With `COMM=MQ` you must specify an MQSeries subsystem for the MQ parameter.

DELAY
Is the number of seconds to be used as a default delay prior to determining the operational mode at when the automation manager instance is started. This value may by overridden on an individual instance basis by the start command parameter. A delay value from 0-999 seconds may be specified, and value of 0 (no delay) will be assumed if omitted. This parameter will be ignored when the automation manager instance is started by Automatic Restart Manager or with the specification of TYPE=HOT.

DIAGDUPMSG
This is the number of message buffer IDs that are validated before send and after receive. This is for diagnostic purposes. A value for *nnnnn* may be chosen between 0 (no validation) and 99999. The default is 0 and performance decreases with larger values.

DIAGINFO
Specifies that the automation manager starts workitem recording from the beginning. `dsname` is the name of the data set that will hold the workitems. The data set must be a sequential file. It must exist and must be catalogued.

Note: The data set name is accepted without checking if the data set exists or if it is accessed by another user.

GRPID
Is the same as that currently generated by the SA OS/390 1.3 customization dialog, and will be prefixed with the string INGXSG to create the XCF group name as used by the communication manager function. Note that this value cannot be overridden, and that a null value will be used if not specified. See “Defining the XCF Group” on page 43.

LEOPT
May be used to pass run-time options to the LE environment.

1. Options forced by the Automation Manager

   The following LE runtime options are set by the Automation Manager during initialization:

   ALL31(ON)
   POSIX(ON)

   Note: These options must not be overridden by installation default settings (CEEDOPT) with the NONOVR attribute.
2. Default options set by the Automation Manager during initialization

The following LE runtime options are set by the Automation Manager during initialization:

```
ANYHEAP(2m,256K,ANYWHERE,FREE)
DEPTHCONDLMT(4)
ERRCOUNT(0)
HEAP(6M,1M,ANYWHERE)
STACK(64K,64K,ANYWHERE,KEEP)
STORAGE(NONE,NONE,NONE,128K)
```

Note: These options may be overridden by the customer.

3. Recommended LE Options

   The following LE options are recommended for the System Automation Manager:

```
   NONIPTSTACK(4K,4K,ANYWHERE,KEEP)
or THREADSTACK(ON,4K,4K,ANYWHERE,KEEP,512K,128K)
          Note:  NONIPTSTACK was replaced by THREADSTACK in OS/390 LE 2.10
   PROFILE(OFF,'')
   RTLS(OFF)
   STORAGE(NONE,NONE,NONE,128K)
   THREADHEAP(4K,4K,ANYWHERE,KEEP)
   TRACE(OFF,4K,DUMP,LE=0)
   VCTRSAVE(OFF)
   XPLINK(OFF)
```

   The LE options below should be tuned using the LE storage reporting facility RPTSTG(ON). The initial value for HEAP storage can be calculated using the following formula:

   heapsize = 16 MB + (*nnn* • 8K),

   where *nnn* is the number of resources and resource groups.

```
ANYHEAP(3M,1M,ANYWHERE,FREE)
HEAP(100M,10M,ANYWHERE,KEEP)
HEAPPOOLS(ON,40,2,64,2,104,2,312,2,624,1,2024,1)
STACK(64K,64K,ANYWHERE,KEEP)
```

   The following option is used to direct output created as a result of specifying RPTOPTS(ON) or RPTSTG(ON). It is also used to direct diagnostic messages written to CEEMSG and CEEMOUT by the Automation Manager.

```
MSGFILE(SYSOUT,FBA,121,0,NOENQ)
```

   The following options are recommended for OS/390 LE Version 2 Release 10:

```
HEAP(100M,10M,ANYWHERE,KEEP,32K,16K)
THREADSTACK(ON,4K,4K,ANYWHERE,KEEP,512K,128K)
```

   The storage options for the below the line heap need to be tuned.

   The following options can be used to gather diagnostic and storage-usage information:

```
RPTSTG(ON)
RPTOPTS(ON)
```

Notes:

1. If an LEOPT= keyword is present in HSAPRM00, it replaces any LEOPT that may have been specified as an input parameter through JCL.
2. When specifying options in HSAPRMxx you may have LEOPT statements on a number of different lines, but the total length of all of the options cannot exceed 4096 characters.

Sample LEOPTS statements are supplied in sample member HSAPRM00.

LOGSTREAM
This defines whether or not the automation manager should establish a connection to the system logger at initialization time. The default is YES.

If NO is specified, no access to the log streams HSA.WORKITEM.HISTORY and HSA.MESSAGE.LOG will be established and subsequently no data will be written into them. No workitem history besides that shown in the INGINFO command is available and no detailed information or warning or error messages are available for problem determination.

MQM This value specifies the subsystem ID (SSID) of the current MQSeries manager.

The MQ parameter and the COMM parameter are mutually dependent. When you specify `COMM=XCF`, the MQ parameter must be left blank. With `COMM=MQ` you must specify an MQSeries subsystem for the MQ parameter.

NUMQTHDS
The NUMQTHDS parameter controls the number of query threads. This value limits the amount of parallel query activity that can be performed. If not specified, a default value of 3 will be used. A maximum of 15 query threads may be specified.

OVRDELETEDELAY
Is the number of days that a schedule override should be retained before being automatically deleted. A value of 0 days indicates that schedule overrides are not to be automatically deleted and is the default if no value is specified. A maximum of 366 days may be specified.

PREF Specifies the preference given to the instance of the automation manager when determining which of the SAMs should become primary automation manager. The number can range from 0 to 15, where 0 is the highest preference. The SAM will only participate in the escalation process when there is no other SAM active with higher preference. The default is 0.

PROMPT
Specifying YES lets you overwrite the *CFGDSN* parameter (the name of the automation manager configuration file). Message HSAM1302A will come up and wait for a response. You may now specify the keyword/value pair

```
CFGDSN=<fully.qualified.data.set.name>
```

or you may use a null or 'U' response to indicate no override values are to be applied.

START
Defines the start mode of the automation manager. During initialization, the automation manager retrieves input from:

1. parameter CFGDSN
2. schedule overrides
3. persistent data store (votes, triggers, resource states)

The following table shows where the automation manager retrieves initialization data for the possible values for parameter START.

	COLD	WARM	HOT
1	name of automation manager configuration file is taken from PARMLIB, the START command or via PROMPT=YES option	last used value taken	last used value taken
2	deleted	taken from last run	taken from last run
3	deleted	deleted	taken from last run

Recommendation: Use COLD for the very first time, or when the schedule override file should be cleared. Use WARM if the automation policy has changed, that is, the automation manager configuration file has been rebuilt. Use HOT in any other case.

The start mode does not affect the secondary automation managers.

The START parameter can also be specified in the Automation Manager JCL. If the HSAPRM00 values are to be used, the START= parameter must be removed from the JCL.

STOPDELAY

Is the number of seconds to be used when an MVS F <jobname>,STOP,DEFER command is entered for the primary automation manager. This delay will be invoked only if one or more secondary automation managers are active and ready when the command is received.

TAKEOVERFILE

This defines the data set name of the takeover file. It must be fully qualified.

Note that if the HSPRM*xx* member is shared among systems in the same XCF group and these systems host downlevel automation managers (lower than SA z/OS 2.3), APAR OA02723 must be installed on the downlevel systems. Otherwise the TAKEOVERFILE parameter will be rejected by means of message HSAM5200E and the automation manager is terminated.

TAKEOVERTIMEOUT

nn may range from 1 to 600 seconds. The default is 12 seconds.

If communication is MQ:

If the (secondary) automation manager performs a takeover, or an automation manager is started HOT, then it is examined whether MQSeries is ready. If this is not the case, the automation manager enters a retry loop. The TAKEOVERTIMEOUT parameter determines how many seconds the automation manager should wait (retry) until it switches from mode=HOT to mode=WARM.

If communication is XCF:

If the (secondary) automation manager performs a takeover, or an automation manager is started HOT, then it will wait for specified seconds before the takeover is done from the takeover file. This delay may be required in order to allow VSAM to perform its cleanup activities on the takeover file.

Syntax for HSAPRM00

Appendix G. INGDLG Command

The INGDLG command allocates required DD names and invokes the customization dialog. Its syntax is:

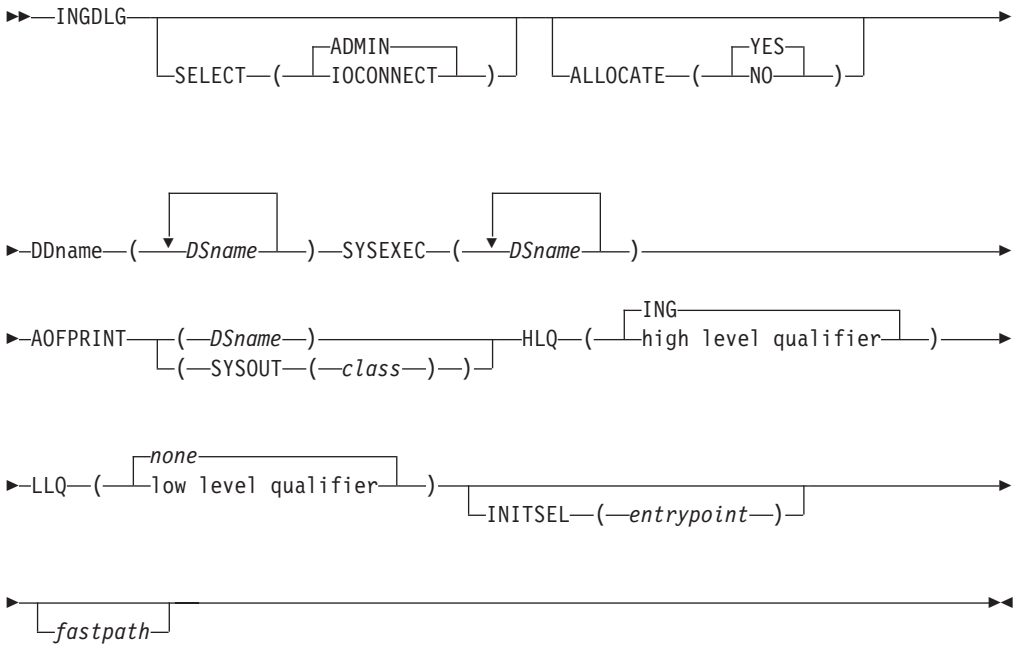


Figure 30. INGDLG Command Syntax

Its parameters are:

SELECT
Enables you to select either ADMIN or IOCONNECT. If the SELECT keyword is not specified, SELECT (ADMIN) is the default.

ADMIN
Enables the selection of automation policy dialogs. This is the default.

IOCONNECT
Enables the selection of I/O connectivity dialogs

ALLOCATE
Controls defining DD names. If ALLOCATE is not specified, ALLOCATE (YES) is the default.

YES Uses any defined DD names. This is the default.

NO Ignores any DD names that have been specified.

DDname (DSname)
Fully qualified data set name to associate. Prefixes and suffixes defined using this panel are not appended to this name. For the DD name AOFPRINT, the following syntax is also valid:

```
AOFPRINT(SYSOUT(class))
```

, where *class* is a valid output class, creating a DD statement with SYSOUT=class. In this case, the output is placed into the JES output class *class*.

SYSEXEC(DSname DSname DSname ...)
For DD name SYSEXEC, multiple data set names are supported: SYSEXEC(DSname DSname DSname ...). This will result in the following command:

```
TSO ALLOC ALTLIB ACTIVATE APPLICATION(EXEC)
        DATASET(DSname DSname DSname ...) UNCOND
```

AOFPRINT
For DD name AOFPRINT, *DSname* is a fully qualified data set name or a request to allocate a SYSOUT data set: AOFPRINT(SYSOUT(class))

HLQ Enables you to change the high level qualifier (HLQ) of the SMP/E data sets, which currently is ING, to a HLQ of your choice. If you do not specify this parameter, ING is retained as the default.

LLQ Enables you to establish a suffix for default data set names (The default is none).

INITSEL
may be used to provide a user-selected entry point to the customization dialog. If this keyword is specified, you will not see the ***Customization Dialog Primary Menu*** as the first panel when invoking the customization dialog, but it provides a fast path to some other panel, for example, the ***Entry Name Selection*** panel for a frequently used entry type. Valid values are those that you can specify as fast path within the customization dialog, for example, to reach the APPC application:

```
=APL; S APPC
```

or to reach application group ***CICS_APG***:

```
=APG; S CICS_APG
```

or to just reach the ***Entry Name Selection*** panel for *Application*s:

```
=APL;
```

fastpath
Any words that are not the reserved keywords. The fastpath words are passed as parameters to I/O operations dialogs, if selected.

Return codes for this routine are:

0 No errors encountered

4 ISPF is not active

8 Error in data set allocation

12 Error in data set de-allocation or a failed allocation

Glossary

This glossary includes terms and definitions from:

- The *IBM Dictionary of Computing* New York: McGraw-Hill, 1994.
- The *American National Standard Dictionary for Information Systems* , ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies can be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018. Definitions are identified by the symbol (A) after the definition.
- The *Information Technology Vocabulary* developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

The following cross-references are used in this glossary:

Contrast with. This refers to a term that has an opposed or substantively different meaning.

Deprecated term for. This indicates that the term should not be used. It refers to a preferred term, which is defined in its proper place in the glossary.

See. This refers the reader to multiple-word terms in which this term appears.

See also. This refers the reader to terms that have a related, but not synonymous, meaning.

Synonym for. This indicates that the term has the same meaning as a preferred term, which is defined in the glossary.

Synonymous with. This is a backward reference from a defined term to all other terms that have the same meaning.

A

ACF. Automation control file.

ACF/NCP. Advanced Communications Function for the Network Control Program. See *Advanced Communications Function* and *Network Control Program*.

ACF/VTAM. Advanced Communications Function for the Virtual Telecommunications Access Method. Synonym for *VTAM*. See *Advanced Communications Function* and *Virtual Telecommunications Access Method*.

active monitoring. In SA z/OS, the acquiring of resource status information by soliciting such information at regular, user-defined intervals. See also *passive monitoring*.

adapter. Hardware card that enables a device, such as a workstation, to communicate with another device, such as a monitor, a printer, or some other I/O device.

Address Space Workflow. In RMF, a measure of how a job uses system resources and the speed at which the job moves through the system. A low workflow indicates that a job has few of the resources it needs and is contending with other jobs for system resources. A high workflow indicates that a job has all the resources it needs to execute.

adjacent hosts. Systems connected in a peer relationship using adjacent NetView sessions for purposes of monitoring and control.

adjacent NetView. In SA z/OS, the system defined as the communication path between two SA z/OS systems that do not have a direct link. An adjacent NetView is used for message forwarding and as a communication link between two SA z/OS systems. For example, the adjacent NetView is used when sending responses from a focal point to a remote system.

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

advanced program-to-program communication (APPC). A set of inter-program communication services that support cooperative transaction processing in a Systems Network Architecture (SNA) network. APPC is the implementation, on a given system, of SNA's logical unit type 6.2.

alert. (1) In SNA, a record sent to a system problem management focal point or to a collection point to communicate the existence of an alert condition. (2) In NetView, a high-priority event that warrants immediate

attention. A database record is generated for certain event types that are defined by user-constructed filters.

alert condition. A problem or impending problem for which some or all of the process of problem determination, diagnosis, and resolution is expected to require action at a control point.

alert focal-point system. See entry for NPDA focal-point system under *focal—point system*.

alert threshold. An application or volume service value that determines the level at which SA z/OS changes the associated icon in the graphical interface to the alert color. SA z/OS may also issue an alert. See *warning threshold*.

AMC. (1) Automation Manager Configuration (2) The Auto Msg Classes entry type

APF. Authorized program facility.

API. Application programming interface.

APPC. Advanced program-to-program communications.

application. An z/OS subsystem or job monitored by SA z/OS.

Application entry. A construct, created with the customization dialogs, used to represent and contain policy for an application.

application group. A named set of applications. An application group is part of an SA z/OS enterprise definition and is used for monitoring purposes.

ApplicationGroup entry. A construct, created with the customization dialogs, used to represent and contain policy for an application group.

application program. (1) A program written for or by a user that applies to the user's work, such as a program that does inventory or payroll. (2) A program used to connect and communicate with stations in a network, enabling users to perform application-oriented activities.

ARM. Automatic restart management.

ASCB. Address space control block.

ASCB status. An application status derived by SA z/OS running a routine (the ASCB checker) that searches the z/OS address space control blocks (ASCBs) for address spaces with a particular job name. The job name used by the ASCB checker is the job name defined in the customization dialog for the application.

ASCII (American National Standard Code for Information Interchange). The standard code, using a coded character set consisting of 7-bit coded characters (8-bit including parity check), for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters. (A)

ASF. Automation status file.

assist mode facility. An SA z/OS facility that uses SDF and enables interaction with automation before SA z/OS takes an automation action. SDF prompts the operator with a suggested action, then provides options for using that action, modifying and using the action, or canceling the action. Also called assist mode, it is enabled using the customization dialogs, or dynamically.

authorized program facility (APF). A facility that permits identification of programs that are authorized to use restricted functions.

automated function. SA z/OS automated functions are automation operators, NetView autotasks that are assigned to perform specific automation functions. However, SA z/OS defines its own synonyms, or *automated function names*, for the NetView autotasks, and these function names are referred to in the sample policy databases provided by SA z/OS. For example, the automation operator AUTBASE corresponds to the SA z/OS automated function BASEOPER.

automated console operations (ACO). The concept (versus a product) of using computers to perform a large subset of tasks ordinarily performed by operators, or assisting operators in performing these tasks.

automatic restart management. A z/OS recovery function that improves the availability of specified subsystems and applications by automatically restarting them under certain circumstances. Automatic restart management is a function of the Cross-System Coupling Facility (XCF) component of z/OS.

automatic restart management element name. In MVS 5.2 or later, z/OS automatic restart management requires the specification of a unique sixteen character name for each address space that registers with it. All automatic restart management policy is defined in terms of the element name, including SA z/OS's interface with it.

automation. The automatic initiation of actions in response to detected conditions or events. SA z/OS provides automation for z/OS applications, z/OS components, and remote systems that run z/OS. SA z/OS also provides tools that can be used to develop additional automation.

automation agent. In SA z/OS, the automation function is split up between the automation manager and the automation agents. The observing, reacting and doing parts are located within the NetView address

space, and are known as the ***automation agents***. The automation agents are responsible for:

- recovery processing
- message processing
- active monitoring: they propagate status changes to the automation manager

automation configuration file. The data set that consists of:

- the automation control file (ACF)
- the automation manager configuration file (AMC)
- the NetView automation table (AT)
- the MPFLSTSA member

automation control file (ACF). In SA z/OS, a file that contains system-level automation policy information. There is one master automation control file for each NetView system on which SA z/OS is installed. Additional policy information and all resource status information is contained in the policy database (PDB). The SA z/OS customization dialogs must be used to build the automation control files. They must not be edited manually.

automation flags. In SA z/OS, the automation policy settings that determine the operator functions that are automated for a resource and the times during which automation is active. When SA z/OS is running, automation is controlled by automation flag policy settings and override settings (if any) entered by the operator. Automation flags are set using the customization dialogs.

automation manager. In SA z/OS, the automation function is split up between the automation manager and the automation agents. The coordination, decision making and controlling functions are processed by each sysplex's ***automation manager***.

The automation manager contains a model of all of the automated resources within the sysplex. The automation agents feed the automation manager with status information and perform the actions that the automation manager tells them to.

The automation manager provides ***sysplex-wide*** automation.

Automation Manager Configuration. The Automation Manager Configuration file (AMC) contains an image of the automated systems in a sysplex or of a standalone system.

Automation NetView. In SA z/OS the NetView that performs routine operator tasks with command procedures or uses other ways of automating system and network management, issuing automatic responses to messages and management services units.

automation operator. NetView automation operators are NetView autotasks that are assigned to perform specific automation functions. See also *automated function*. NetView automation operators may receive messages and process automation procedures. There are no logged-on users associated with automation operators. Each automation operator is an operating system task and runs concurrently with other NetView tasks. An automation operator could be set up to handle JES2 messages that schedule automation procedures, and an automation statement could route such messages to the automation operator. Similar to *operator station task*. SA z/OS message monitor tasks and target control tasks are automation operators.

automation policy. The policy information governing automation for individual systems. This includes automation for applications, z/OS subsystems, z/OS data sets, and z/OS components.

automation policy settings. The automation policy information contained in the automation control file. This information is entered using the customization dialogs. You can display or modify these settings using the customization dialogs.

automation procedure. A sequence of commands, packaged as a NetView command list or a command processor written in a high-level language. An automation procedure performs automation functions and runs under NetView.

automation status file. In SA z/OS, a file containing status information for each automated subsystem, component or data set. This information is used by SA z/OS automation when taking action or when determining what action to take. In Release 2 and above of AOC/MVS, status information is also maintained in the operational information base.

automation table (AT). See *NetView automation table*.

autotask. A NetView automation task that receives messages and processes automation procedures. There are no logged-on users associated with autotasks. Each autotask is an operating system task and runs concurrently with other NetView tasks. An autotask could be set up to handle JES2 messages that schedule automation procedures, and an automation statement could route such messages to the autotasks. Similar to *operator station task*. SA z/OS message monitor tasks and target control tasks are autotasks. Also called *automation operator*.

available. In VTAM programs, pertaining to a logical unit that is active, connected, enabled, and not at its session limit.

B

basic mode. A central processor mode that does not use logical partitioning. Contrast with *logically partitioned (LPAR) mode*.

BCP Internal Interface. Processor function of CMOS-390, zSeries processor families. It allows the communication between basic control programs such as z/OS and the processor support element in order to exchange information or to perform processor control functions. Programs using this function can perform hardware operations such as ACTIVATE or SYSTEM RESET.

beaconing. The repeated transmission of a frame or messages (beacon) by a console or workstation upon detection of a line break or outage.

BookManager. An IBM product that lets users view softcopy documents on their workstations.

C

central processor (CP). The part of the computer that contains the sequencing and processing facilities for instruction execution, initial program load (IPL), and other machine operations.

central processor complex (CPC). A physical collection of hardware that consists of central storage, one or more central processors, timers, and channels.

central site. In a distributed data processing network, the central site is usually defined as the focal point for alerts, application design, and remote system management tasks such as problem management.

CFR/CFS and ISC/ISR. I/O operations can display and return data about integrated system channels (ISC) connected to a coupling facility and coupling facility receiver (CFR) channels and coupling facility sender (CFS) channels.

channel. A path along which signals can be sent; for example, data channel, output channel. See also *link*.

channel path identifier. A system-unique value assigned to each channel path.

CHPID. In SA z/OS, channel path ID; the address of a channel.

CHPID port. A label that describes the system name, logical partitions, and channel paths.

channel-attached. (1) Attached directly by I/O channels to a host processor (for example, a channel-attached device). (2) Attached to a controlling unit by cables, rather than by telecommunication lines. Contrast with *link-attached*. Synonymous with *local*.

CI. Console integration.

CICS/VS. Customer Information Control System for Virtual Storage.

CLIST. Command list.

clone. A set of definitions for application instances that are derived from a basic application definition by substituting a number of different system-specific values into the basic definition.

clone ID. A generic means of handling system-specific values such as the MVS SYSCLONE or the VTAM subarea number. Clone IDs can be substituted into application definitions and commands to customize a basic application definition for the system that it is to be instantiated on.

CNC. A channel path that transfers data between a host system image and an ESCON control unit. It can be point-to-point or switchable.

command. A request for the performance of an operation or the execution of a particular program.

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

command list (CLIST). (1) A list of commands and statements, written in the NetView command list language or the REXX language, designed to perform a specific function for the user. In its simplest form, a command list is a list of commands. More complex command lists incorporate variable substitution and conditional logic, making the command list more like a conventional program. Command lists are typically interpreted rather than being compiled. (2) In SA z/OS, REXX command lists that can be used for automation procedures.

command procedure. In NetView, either a command list or a command processor.

command processor. A module designed to perform a specific function. Command processors, which can be written in assembler or a high-level language (HLL), are issued as commands.

Command Tree/2. An OS/2-based program that helps you build commands on an OS/2 window, then routes the commands to the destination you specify (such as a 3270 session, a file, a command line, or an application program). It provides the capability for operators to build commands and route them to a specified destination.

common commands. The SA z/OS subset of the CPC operations management commands.

common routine. One of several SA z/OS programs that perform frequently used automation functions. Common routines can be used to create new automation procedures.

Common User Access (CUA) architecture. Guidelines for the dialog between a human and a workstation or terminal.

communication controller. A type of communication control unit whose operations are controlled by one or more programs stored and executed in the unit or by a program executed in a processor to which the controller is connected. It manages the details of line control and the routing of data through a network.

communication line. Deprecated term for *telecommunication line*.

connectivity view. In SA z/OS, a display that uses graphic images for I/O devices and lines to show how they are connected.

console automation. The process of having NetView facilities provide the console input usually handled by the operator.

console connection. In SA z/OS, the 3270 or ASCII (serial) connection between a PS/2 computer and a target system. Through this connection, the workstation appears (to the target system) to be a console.

console integration (CI). A hardware facility that if supported by an operating system, allows operating system messages to be transferred through an internal hardware interface for display on a system console. Conversely, it allows operating system commands entered at a system console to be transferred through an internal hardware interface to the operating system for processing.

consoles. Workstations and 3270-type devices that manage your enterprise.

Control units. Hardware units that control I/O operations for one or more devices. You can view information about control units through I/O operations, and can start or stop data going to them by blocking and unblocking ports.

controller. A unit that controls I/O operations for one or more devices.

couple data set. A data set that is created through the XCF couple data set format utility and, depending on its designated type, is shared by some or all of the z/OS systems in a sysplex. See also *sysplex couple data set* and *XCF couple data set*.

coupling facility. The hardware element that provides high-speed caching, list processing, and locking functions in a sysplex.

CP. Central processor.

CPC. Central processor complex.

CPC operations management commands. A set of commands and responses for controlling the operation of System/390 CPCs.

CPC subset. All or part of a CPC. It contains the minimum *resource* to support a single control program.

CPCB. Command processor control block; an I/O operations internal control block that contains information about the command being processed.

CPU. Central processing unit. Deprecated term for *processor*.

cross-system coupling facility (XCF). XCF is a component of z/OS that provides functions to support cooperation between authorized programs running within a sysplex.

CTC. The channel-to-channel (CTC) channel can communicate with a CTC on another host for intersystem communication.

Customer Information Control System (CICS). A general-purpose transactional program that controls online communication between terminal users and a database for a large number of end users on a real-time basis.

customization dialogs. The customization dialogs are an ISPF application. They are used to customize the enterprise policy, like, for example, the enterprise resources and the relationships between resources, or the automation policy for systems in the enterprise. How to use these dialogs is described in *IBM Tivoli System Automation for z/OS Customizing and Programming*.

CVC. A channel operating in converted (CVC) mode transfers data in blocks and a CBY channel path transfers data in bytes. Converted CVC or CBY channel paths can communicate with a parallel control unit. This resembles a point-to-point parallel path and dedicated connection, regardless whether it passes through a switch.

D

DASD. Direct access storage device.

data services task (DST). The NetView subtask that gathers, records, and manages data in a VSAM file or a network device that contains network management information.

data set. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

data set members. Members of partitioned data sets that are individually named elements of a larger file that can be retrieved by name.

DBCS. Double-byte character set.

DCCF. Disabled console communication facility.

DCF. Document composition facility.

DELAY Report. An RMF report that shows the activity of each job in the system and the hardware and software resources that are delaying each job.

Devices. You can see information about all devices (such as printers, tape or disk drives, displays, or communications controllers) attached to a particular switch, and control paths and jobs to devices.

DEVR Report. An RMF report that presents information about the activity of I/O devices that are delaying jobs.

dialog. Interactive 3270 panels.

direct access storage device (DASD). A device in which the access time is effectively independent of the location of the data; for example, a disk.

disabled console communication facility (DCCF). A z/OS component that provides limited-function console communication during system recovery situations.

display. (1) To present information for viewing, usually on the screen of a workstation or on a hardcopy device. (2) Deprecated term for *panel*.

disk operating system (DOS). (1) An operating system for computer systems that use disks and diskettes for auxiliary storage of programs and data. (2) Software for a personal computer that controls the processing of programs. For the IBM Personal Computer, the full name is Personal Computer Disk Operating System (PCDOS).

distribution manager. The component of the NetView program that enables the host system to use, send, and delete files and programs in a network of computers.

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

double-byte character set (DBCS). A character set, such as Kanji, in which each character is represented by a 2-byte code.

DP enterprise. Data processing enterprise.

DSIPARM. This file is a collection of members of NetView's customization.

DST. Data Services Task.

E

EBCDIC. Extended binary-coded decimal interchange code. A coded character set consisting of 8-bit coded characters.

ECB. Event control block. A control block used to represent the status of an event.

EMCS. Extended multiple console support.

enterprise. An organization, such as a business or a school, that uses data processing.

enterprise monitoring. Enterprise monitoring is used by SA z/OS to update the *NetView Management Console (NMC)* resource status information that is stored in the *Resource Object Data Manager (RODM)*. Resource status information is acquired by enterprise monitoring of the *Resource Measurement Facility (RMF) Monitor III* service information at user-defined intervals. SA z/OS stores this information in its operational information base, where it is used to update the information presented to the operator in graphic displays.

entries. Resources, such as processors, entered on panels.

entry type. Resources, such as processors or applications, used for automation and monitoring.

environment. Data processing enterprise.

error threshold. An automation policy setting that specifies when SA z/OS should stop trying to restart or recover an application, subsystem or component, or offload a data set.

ESA. Enterprise Systems Architecture.

eServer. Processor family group designator used by the SA z/OS customization dialogs to define a target hardware as member of the zSeries or 390-CMOS processor families.

event. (1) In NetView, a record indicating irregularities of operation in physical elements of a network. (2) An occurrence of significance to a task; for example, the completion of an asynchronous operation, such as an input/output operation. (3) Events are part of a trigger condition, in a way that if all events of a trigger condition have occurred, a *STARTUP* or *SHUTDOWN* of an application is performed.

exception condition. An occurrence on a system that is a deviation from normal operation. SA z/OS monitoring highlights exception conditions and allows an SA z/OS enterprise to be managed by exception.

extended recovery facility (XRF). A facility that minimizes the effect of failures in z/OS, VTAM, the host processor, or high availability applications during sessions between high availability applications and designated terminals. This facility provides an alternate subsystem to take over sessions from the failing subsystem.

F

fallback system. See *secondary system*.

field. A collection of bytes within a record that are logically related and are processed as a unit.

file manager commands. A set of SA z/OS commands that read data from or write data to the automation control file or the operational information base. These commands are useful in the development of automation that uses SA z/OS facilities.

focal point. In NetView, the focal-point domain is the central host domain. It is the central control point for any management services element containing control of the network management data.

focus host. A processor with the role in the context of a unified system image

focal point system. (1) A system that can administer, manage, or control one or more target systems. There are a number of different focal point system associated with IBM automation products. (2) **NMC focal point system**. The NMC focal point system is a NetView system with an attached workstation server and LAN that gathers information about the state of the network. This focal point system uses RODM to store the data it collects in the data model. The information stored in RODM can be accessed from any LAN-connected workstation with NetView Management Console installed. (3) **NPDA focal point system.** This is a NetView system that collects all the NPDA alerts that are generated within your enterprise. It is supported by NetView. If you have SA z/OS installed the NPDA focal point system must be the same as your NMC focal point system. The NPDA focal point system is also known as the *alert focal point system*. (4) **SA z/OS Processor Operations focal point system.** This is a NetView system that has SA z/OS host code installed. The SA z/OS Processor Operations focal point system receives messages from the systems and operator consoles of the machines that it controls. It provides full systems and operations console function for its target systems. It can be used to IPL these systems. Note that some restrictions apply to the Hardware Management Console for an S/390 microprocessor cluster. (5) **SA z/OS SDF focal point system.** The SA z/OS SDF focal point system is an SA z/OS NetView system that collects status information from other SA z/OS NetViews within your enterprise. (6) **Status focal point system.** In NetView, the system to which STATMON, VTAM and NLDM send status information on network resources. If you have a NMC focal point, it must be on the same system as the Status focal point. (7) **Hardware Management Console.** Although not listed as a focal point, the Hardware Management Console acts as a focal point for the console functions of an S/390 microprocessor cluster. Unlike all the other focal points in this definition, the Hardware Management Console runs on a LAN-connected workstation,

frame. For a System/390 microprocessor cluster, a frame contains one or two central processor complexes (CPCs), support elements, and AC power distribution.

full-screen mode. In NetView, a form of panel presentation that makes it possible to display the contents of an entire workstation screen at once. Full-screen mode can be used for fill-in-the-blanks prompting. Contrast with *line mode*.

G

gateway session. An NetView-NetView Task session with another system in which the SA z/OS outbound gateway operator logs onto the other NetView session without human operator intervention. Each end of a gateway session has both an inbound and outbound gateway operator.

generic alert. Encoded alert information that uses code points (defined by IBM and possibly customized by users or application programs) stored at an alert receiver, such as NetView.

generic routines. In SA z/OS, a set of self-contained automation routines that can be called from the NetView automation table, or from user-written automation procedures.

group. A collection of target systems defined through configuration dialogs. An installation might set up a group to refer to a physical site or an organizational or application entity.

group entry. A construct, created with the customization dialogs, used to represent and contain policy for a group.

group entry type. A collection of target systems defined through the customization dialog. An installation might set up a group to refer to a physical site or an organizational entity. Groups can, for example, be of type STANDARD or SYSPLEX.

H

Hardware Management Console. A console used by the operator to monitor and control a System/390 microprocessor cluster.

Hardware Management Console Application (HWMCA). A direct-manipulation object-oriented graphical user interface that provides single point of control and single system image for hardware elements. HWMCA provides customer grouping support, aggregated and real-time system status using colors, consolidated hardware messages support, consolidated operating system messages support, consolidated

service support, and hardware commands targeted at a single system, multiple systems, or a customer group of systems.

heartbeat. In SA z/OS, a function that monitors the validity of the status forwarding path between remote systems and the NMC focal point, and monitors the availability of remote z/OS systems, to ensure that status information displayed on the SA z/OS workstation is current.

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

hierarchy. In the NetView program, the resource types, display types, and data types that make up the organization, or levels, in a network.

high-level language (HLL). A programming language that does not reflect the structure of any particular computer or operating system. For the NetView program, the high-level languages are PL/I and C.

HLL. High-level language.

host system. In a coupled system or distributed system environment, the system on which the facilities for centralized automation run. SA z/OS publications refer to target systems or focal-point systems instead of hosts.

host (primary processor). The processor at which you enter a command (also known as the *issuing processor*).

HWMCA. Hardware Management Console Application. Application for the graphic hardware management console that monitors and controls a central processor complex. It is attached to a target processor (a system 390 microprocessor cluster) as a dedicated system console. This microprocessor uses OCF to process commands.

I

images. A grouping of processors and I/O devices that you define. You can define a single-image mode that allows a multiprocessor system to function as one central processor image.

IMS/VS. Information Management System/Virtual Storage.

inbound. In SA z/OS, messages sent to the focal-point system from the PC or target system.

inbound gateway operator. The automation operator that receives incoming messages, commands, and responses from the outbound gateway operator at the sending system. The inbound gateway operator handles communications with other systems using a gateway session.

Information Management System/Virtual Storage (IMS/VS). A database/data communication (DB/DC) system that can manage complex databases and networks. Synonymous with IMS.

INGEIO PROC. The I/O operations default procedure name; part of the SYS1.PROCLIB.

initial program load (IPL). (1) The initialization procedure that causes an operating system to commence operation. (2) The process by which a configuration image is loaded into storage at the beginning of a workday or after a system malfunction. (3) The process of loading system programs and preparing a system to run jobs.

initialize automation. SA z/OS-provided automation that issues the correct z/OS start command for each subsystem when SA z/OS is initialized. The automation ensures that subsystems are started in the order specified in the automation control file and that prerequisite applications are functional.

input/output support processor (IOSP). The hardware unit that provides I/O support functions for the primary support processor and maintenance support functions for the processor controller.

Interactive System Productivity Facility (ISPF). An IBM licensed program that serves as a full-screen editor and dialog manager. Used for writing application programs, it provides a means of generating standard screen panels and interactive dialogs between the application programmer and the terminal user.

interested operator list. The list of operators who are to receive messages from a specific target system.

internal token. A *logical token* (LTOK); name by which the I/O resource or object is known; stored in IODF.

IOCDS. I/O configuration data set. The data set that describes the I/O configuration.

I/O Ops. I/O operations.

IOSP. Input/Output Support Processor.

I/O operations. The part of SA z/OS that provides you with a single point of logical control for managing connectivity in your active I/O configurations. I/O operations takes an active role in detecting unusual conditions and lets you view and change paths between a processor and an I/O device, using dynamic switching (the ESCON director). Also known as I/O Ops.

I/O resource number. Combination of channel path identifier (CHPID), device number, etc. See internal token.

IPL. Initial program load.

ISA. Industry Standard Architecture.

ISPF. Interactive System Productivity Facility.

ISPF console. From this 3270-type console you are logged onto ISPF to use the runtime panels for I/O operations and SA z/OS customization panels.

issuing host. See *primary host*; the base program at which you enter a command for processing.

J

JCL. Job control language.

JES. Job entry subsystem.

job. (1) A set of data that completely defines a unit of work for a computer. A job usually includes all necessary computer programs, linkages, files, and instructions to the operating system. (2) An address space.

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

job entry subsystem (JES). A facility for spooling, job queuing, and managing I/O. In SA z/OS publications, JES refers to JES2 or JES3, unless distinguished as being either one or the other.

K

Kanji. An ideographic character set used in Japanese. See also *double-byte character set*.

L

LAN. Local area network.

line mode. A form of screen presentation in which the information is presented a line at a time in the message area of the terminal screen. Contrast with *full-screen mode*.

link. (1) In SNA, the combination of the link connection and the link stations joining network nodes; for example, a System/370 channel and its associated protocols, a serial-by-bit connection under the control of synchronous data link control (SDLC). (2) In SA z/OS, link connection is the physical medium of transmission.

link-attached. Describes devices that are physically connected by a telecommunication line. Contrast with *channel-attached*.

Linux for zSeries and S/390. UNIX-like open source operating system conceived by Linus Torvalds and developed across the internet.

local. Pertaining to a device accessed directly without use of a telecommunication line. Synonymous with *channel-attached*.

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

logical partition (LP). A subset of the processor hardware that is defined to support an operating system. See also *logically partitioned (LPAR) mode*.

logical switch number (LSN). Assigned with the switch parameter of the CHPID macro of the IOCP.

logical token (LTOK). Resource number of an object in the IODF.

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

logical unit (LU) 6.2. A type of logical unit that supports general communications between programs in a distributed processing environment. LU 6.2 is characterized by (a) a peer relationship between session partners, (b) efficient use of a session for multiple transactions, (c) comprehensive end-to-end error processing, and (d) a generic application program interface (API) consisting of structured verbs that are mapped into a product implementation. Synonym for advanced program-to-program communications (APPC).

logically partitioned (LPAR) mode. A central processor mode that enables an operator to allocate system processor hardware resources among several logical partitions. Contrast with *basic mode*.

LOGR. The sysplex logger.

LP. Logical partition.

LPAR. Logically partitioned (mode).

LU. Logical unit.

LU-LU session. In SNA, a session between two logical units (LUs) in an SNA network. It provides communication between two end users, or between an end user and an LU services component.

LU 6.2. Logical unit 6.2.

LU 6.2 session. A session initiated by VTAM on behalf of an LU 6.2 application program, or a session initiated by a remote LU in which the application program specifies that VTAM is to control the session by using the APPCCMD macro.

M

MAT. Deprecated term for NetView Automation Table.

MCA. Micro Channel* architecture.

MCS. Multiple console support.

member. A specific function (one or more modules/routines) of a multisystem application that is defined to XCF and assigned to a group by the multisystem application. A member resides on one system in the sysplex and can use XCF services to communicate (send and receive data) with other members of the same group.

message automation table (MAT). Deprecated term for NetView Automation Table.

message class. A number that SA z/OS associates with a message to control routing of the message. During automated operations, the classes associated with each message issued by SA z/OS are compared to the classes assigned to each notification operator. Any operator with a class matching one of the message's classes receives the message.

message forwarding. The SA z/OS process of sending messages generated at an SA z/OS target system to the SA z/OS focal-point system.

message group. Several messages that are displayed together as a unit.

message monitor task. A task that starts and is associated with a number of communications tasks. Message monitor tasks receive inbound messages from a communications task, determine the originating target system, and route the messages to the appropriate target control tasks.

message processing facility (MPF). A z/OS table that screens all messages sent to the z/OS console. The MPF compares these messages with a customer-defined list of messages on which to automate, suppress from the z/OS console display, or both, and marks messages to automate or suppress. Messages are then broadcast on the subsystem interface (SSI).

message suppression. The ability to restrict the amount of message traffic displayed on the z/OS console.

Micro Channel architecture. The rules that define how subsystems and adapters use the Micro Channel bus in a computer. The architecture defines the services that each subsystem can or must provide.

microprocessor. A processor implemented on one or a small number of chips.

migration. Installation of a new version or release of a program to replace an earlier version or release.

MP. Multiprocessor.

MPF. Message processing facility.

MPFLSTSA. The MPFLST member that is built by SA z/OS.

Multiple Virtual Storage (MVS). An IBM licensed program. MVS, which is the predecessor of OS/390, is an operating system that controls the running of programs on a System/390 or System/370 processor. MVS includes an appropriate level of the Data Facility Product (DFP) and Multiple Virtual Storage/Enterprise Systems Architecture System Product Version 5 (MVS/ESA SP5).

multiprocessor (MP). A CPC that can be physically partitioned to form two operating processor complexes.

multisystem application. An application program that has various functions distributed across z/OS images in a multisystem environment.

multisystem environment. An environment in which two or more z/OS images reside in one or more processors, and programs on one image can communication with programs on the other images.

MVS. Multiple Virtual Storage, predecessor of z/OS.

MVS image. A single occurrence of the MVS/ESA operating system that has the ability to process work.

MVS/JES2. Multiple Virtual Storage/Job Entry System 2. A z/OS subsystem that receives jobs into the system, converts them to internal format, selects them for execution, processes their output, and purges them from the system. In an installation with more than one processor, each JES2 processor independently controls its job input, scheduling, and output processing.

MVS/ESA. Multiple Virtual Storage/Enterprise Systems Architecture.

N

NAU. (1) Network accessible unit. (2) Network addressable unit.

NCCF. Network Communications Control Facility.

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

NetView. An IBM licensed program used to monitor a network, manage it, and diagnose network problems. NetView consists of a command facility that includes a presentation service, command processors, automation based on command lists, and a transaction processing structure on which the session monitor, hardware monitor, and terminal access facility (TAF) network management applications are built.

network accessible unit (NAU). A logical unit (LU), physical unit (PU), control point (CP), or system services control point (SSCP). It is the origin or the destination of information transmitted by the path control network. Synonymous with *network addressable unit*.

network addressable unit (NAU). Synonym for *network accessible unit*.

NetView automation procedures. A sequence of commands, packaged as a NetView command list or a command processor written in a high-level language. An automation procedure performs automation functions and runs under the NetView program.

NetView automation table (AT). A table against which the NetView program compares incoming messages. A match with an entry triggers the specified response. SA z/OS entries in the NetView automation table trigger an SA z/OS response to target system conditions. Formerly known as the message automation table (MAT).

NetView Command list language. An interpretive language unique to NetView that is used to write command lists.

NetView (NCCF) console. A 3270-type console for NetView commands and runtime panels for system operations and processor operations.

NetView Graphic Monitor Facility (NGMF). Deprecated term for NetView Management Console.

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

NetView log. The log in which NetView records events pertaining to NetView and SA z/OS activities.

NetView message table. See *NetView automation table*.

NetView Management Console (NMC). A function of the NetView program that provides a graphic, topological presentation of a network that is controlled by the NetView program. It provides the operator different views of a network, multiple levels of graphical detail, and dynamic resource status of the network. This function consists of a series of graphic windows that allows you to manage the network interactively. Formerly known as the NetView Graphic Monitor Facility (NGMF).

NetView-NetView task (NNT). The task under which a cross-domain NetView operator session runs. Each NetView program must have a NetView-NetView task to establish one NNT session. See also *operator station task*.

NetView-NetView Task session. A session between two NetView programs that runs under a NetView-NetView Task. In SA z/OS, NetView-NetView Task sessions are used for communication between focal point and remote systems.

NetView paths via logical unit (LU 6.2). A type of network-accessible port (VTAM connection) that enables end users to gain access to SNA network resources and communicate with each other. LU 6.2 permits communication between processor operations and the workstation.

network. (1) An interconnected group of nodes. (2) In data processing, a user application network. See *SNA network*.

Network Communications Control Facility (NCCF). The operations control facility for the network. NCCF consists of a presentation service, command processors, automation based on command lists, and a transaction processing structure on which the network management applications NLDM and NPDA are built. NCCF is a precursor to the NetView command facility.

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

Networking NetView. In SA z/OS the NetView that performs network management functions, such as managing the configuration of a network. In SA z/OS it is common to also route alerts to the Networking NetView.

Network Problem Determination Application (NPDA). An NCCF application that helps you identify network problems, such as hardware, software, and microcode, from a central control point using interactive display methods. The alert manager for the network. The precursor of the NetView hardware monitor.

NGMF. Deprecated term for NetView Management Console.

NGMF focal-point system. Deprecated term for NMC focal point system.

NIP. Nucleus initialization program.

NMC focal point system. See *focal point system*

NMC workstation. The NMC workstation is the primary way to dynamically monitor SA z/OS systems. From the windows, you see messages, monitor status, view trends, and react to changes before they cause problems for end users. You can use multiple windows to monitor multiple views of the system.

NNT. NetView-NetView task.

notification message. An SA z/OS message sent to a human notification operator to provide information about significant automation actions. Notification messages are defined using the customization dialogs.

notification operator. A NetView console operator who is authorized to receive SA z/OS notification messages. Authorization is made through the customization dialogs.

NPDA. Network Problem Determination Application.

NPDA focal-point system. See *focal-point system*.

NTRI. NCP/token-ring interconnection.

nucleus initialization program (NIP). The program that initializes the resident control program; it allows the operator to request last-minute changes to certain options specified during system generation.

O

objective value. An average Workflow or Using value that SA z/OS can calculate for applications from past service data. SA z/OS uses the objective value to calculate warning and alert thresholds when none are explicitly defined.

OCA. In SA z/OS, operator console A, the active operator console for a target system. Contrast with *OCB*.

OCB. In SA z/OS, operator console B, the backup operator console for a target system. Contrast with *OCA*.

OCF. Operations command facility.

OCF-based processor. A central processor complex that uses an operations command facility for interacting with human operators or external programs to perform operations management functions on the CPC.

OPC/A. Operations Planning and Control/Advanced.

OPC/ESA. Operations Planning and Control/Enterprise Systems Architecture.

operating system (OS). Software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominantly software, partial hardware implementations are possible. (T)

operations. The real-time control of a hardware device or software function.

operations command facility (OCF). A facility of the central processor complex that accepts and processes operations management commands.

Operations Planning and Control/Advanced (OPC/A). A set of IBM licensed programs that automate, plan, and control batch workload. OPC/A analyzes system and workload status and submits jobs accordingly.

Operations Planning and Control/ESA (OPC/ESA). A set of IBM licensed programs that automate, plan, and control batch workload. OPC/ESA analyzes system and workload status and submits jobs accordingly. The successor to OPC/A.

operator. (1) A person who keeps a system running. (2) A person or program responsible for managing activities controlled by a given piece of software such as z/OS, the NetView program, or IMS. (3) A person who operates a device. (4) In a language statement, the lexical entity that indicates the action to be performed on operands.

operator console. (1) A functional unit containing devices that are used for communications between a computer operator and a computer. (T) (2) A display console used for communication between the operator and the system, used primarily to specify information concerning application programs and I/O operations and to monitor system operation. (3) In SA z/OS, a console that displays output from and sends input to the operating system (z/OS, LINUX, VM, VSE). Also called *operating system console*. In the SA z/OS operator commands and configuration dialogs, OC is used to designate a target system operator console.

operator station task (OST). The NetView task that establishes and maintains the online session with the network operator. There is one operator station task for each network operator who logs on to the NetView program.

operator view. A set of group, system, and resource definitions that are associated together for monitoring purposes. An operator view appears as a graphic display in the graphical interface showing the status of the defined groups, systems, and resources.

OperatorView entry. A construct, created with the customization dialogs, used to represent and contain policy for an operator view.

OS. Operating system.

z/OS component. A part of z/OS that performs a specific z/OS function. In SA z/OS, component refers to entities that are managed by SA z/OS automation.

z/OS subsystem. Software products that augment the z/OS operating system. JES and TSO/E are examples of z/OS subsystems. SA z/OS includes automation for some z/OS subsystems.

z/OS system. A z/OS image together with its associated hardware, which collectively are often referred to simply as a system, or z/OS system.

OSA. I/O operations can display the open system adapter (OSA) channel logical definition, physical attachment, and status. You can configure an OSA channel on or off.

OST. Operator station task.

outbound. In SA z/OS, messages or commands from the focal-point system to the target system.

outbound gateway operator. The automation operator that establishes connections to other systems. The outbound gateway operator handles communications with other systems through a gateway session. The automation operator sends messages, commands, and responses to the inbound gateway operator at the receiving system.

P

page. (1) The portion of a panel that is shown on a display surface at one time. (2) To transfer instructions, data, or both between real storage and external page or auxiliary storage.

panel. (1) A formatted display of information that appears on a terminal screen. Panels are full-screen 3270-type displays with a monospaced font, limited color and graphics. (2) By using SA z/OS panels you can see status, type commands on a command line using a keyboard, configure your system, and passthru to other consoles. See also *help panel*. (3) In computer graphics, a display image that defines the locations and characteristics of display fields on a display surface. Contrast with *screen*.

parallel channels. Parallel channels operate in either byte (BY) or block (BL) mode. You can change connectivity to a parallel channel operating in block mode.

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

partition. (1) A fixed-size division of storage. (2) In VSE, a division of the virtual address area that is available for program processing. (3) On an IBM Personal Computer fixed disk, one of four possible storage areas of variable size; one can be accessed by DOS, and each of the others may be assigned to another operating system.

partitionable CPC. A CPC that can be divided into 2 independent CPCs. See also *physical partition, single-image mode, MP, side*.

partitioned data set (PDS). A data set in direct access storage that is divided into partitions, called *members*, each of which can contain a program, part of a program, or data.

passive monitoring. In SA z/OS, the receiving of unsolicited messages from z/OS systems and their resources. These messages can prompt updates to resource status displays. See also *active monitoring.*

PCE. Processor controller. Also known as the “support processor” or “service processor” in some processor families.

PDB. Policy Database

PDS. Partitioned data set.

physical partition. Part of a CPC that operates as a CPC in its own right, with its own copy of the operating system.

physical unit (PU). In SNA, the component that manages and monitors the resources (such as attached links and adjacent link stations) of a node, as requested by a system services control point (SSCP) through an SSCP-PU session. An SSCP activates a session with the physical unit to indirectly manage, through the PU, resources of the node such as attached links.

physically partitioned (PP) configuration. A mode of operation that allows a multiprocessor (MP) system to function as two or more independent CPCs having separate power, water, and maintenance boundaries. Contrast with *single-image (SI) configuration*.

POI. Program operator interface.

policy. The automation and monitoring specifications for an SA z/OS enterprise. See *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

policy database. The database where the automation policy is recorded. Also known as the PDB.

POR. Power-on reset.

port. (1) System hardware to which the I/O devices are attached. (2) On an ESCON switch, a port is an addressable connection. The switch routes data through the ports to the channel or control unit. Each port has a name that can be entered into a switch matrix, and you

can use commands to change the switch configuration. (3) An access point (for example, a logical unit) for data entry or exit. (4) A functional unit of a node through which data can enter or leave a data network. (5) In data communication, that part of a data processor that is dedicated to a single data channel for the purpose of receiving data from or transmitting data to one or more external, remote devices. (6) power-on reset (POR) (7) A function that re-initializes all the hardware in a CPC and loads the internal code that enables the CPC to load and run an operating system.

PP. Physically partitioned (configuration).

PPT. Primary POI task.

primary host. The base program at which you enter a command for processing.

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

primary system. A system is a primary system for an application if the application is normally meant to be running there. SA z/OS starts the application on all the primary systems defined for it.

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

processor controller. Hardware that provides support and diagnostic functions for the central processors.

processor operations. The part of SA z/OS that monitors and controls processor (hardware) operations. Processor operations provides a connection from a focal-point system to a target system. Through NetView on the focal-point system, processor operations automates operator and system consoles for monitoring and recovering target systems. Also known as ProcOps.

processor operations control file. Named by your system programmer, this file contains configuration and customization information. The programmer records the name of this control file in the processor operations file generation panel ISQDPG01.

Processor Resource/Systems Manager (PR/SM). The feature that allows the processor to use several operating system images simultaneously and provides logical partitioning capability. See also *LPAR*.

ProcOps. Processor operations.

ProcOps Service Machine (PSM). The PSM is a CMS user on a VM host system. It runs a CMS multitasking application that serves as ″virtual hardware″ for ProcOps. ProOps communicates via the PSM with the VM guest systems that are defined as target systems within ProcOps.

product automation. Automation integrated into the base of SA z/OS for the products DB2, CICS, IMS, OPC (formerly called *features*).

program to program interface (PPI). A NetView function that allows user programs to send or receive data buffers from other user programs and to send alerts to the NetView hardware monitor from system and application programs.

protocol. In SNA, the meanings of, and the sequencing rules for, requests and responses used for managing the network, transferring data, and synchronizing the states of network components.

proxy resource. A resource defined like an entry type APL representing a processor operations target system.

PR/SM. Processor Resource/Systems Manager.

PSM. ProcOps Service Machine.

PU. Physical unit.

R

remote system. A system that receives resource status information from an SA z/OS focal-point system. An SA z/OS remote system is defined as part of the same SA z/OS enterprise as the SA z/OS focal-point system to which it is related.

requester. A requester is a workstation software, which enables users to log on to a domain, that is, to the server(s) belonging to this domain, and use the resources in this domain. After the log on to a domain, users can access the shared resources and use the processing capability of the server(s). Because the bigger part of shared resources is on the server(s), users can reduce hardware investment.

resource. (1) Any facility of the computing system or operating system required by a job or task, and including main storage, input/output devices, the processing unit, data sets, and control or processing programs. (2) In NetView, any hardware or software that provides function to the network. (3) In SA z/OS, any z/OS application, z/OS component, job, device, or target system capable of being monitored or automated through SA z/OS.

Resource Access Control Facility (RACF). A program that can provide data security for all your resources. RACF protects data from accidental or deliberate unauthorized disclosure, modification, or destruction.

resource group. A physically partitionable portion of a processor. Also known as a *side*.

Resource Monitoring Facility (RMF) Monitor III. A program that measures and reports on the availability and activity of system hardware and software resources, such as processors, devices, storage, and address spaces. RMF can issue online reports about system performance problems as they occur.

Resource Object Data Manager (RODM). A data cache manager designed to support process control and automation applications. RODM provides an in-memory data cache for maintaining real-time data in an address space that is accessible by multiple applications. RODM also allows an application to query an object and receive a rapid response and act on it.

resource token. A unique internal identifier of an ESCON resource or resource number of the object in the IODF.

restart automation. SA z/OS-provided automation that monitors subsystems to ensure that they are running. If a subsystem fails, SA z/OS attempts to restart it according to the policy in the automation control file.

Restructured Extended Executor (REXX). An interpretive language used to write command lists.

return code. A code returned from a program used to influence the issuing of subsequent instructions.

REXX. Restructured Extended Executor.

REXX procedure. A command list written with the Restructured Extended Executor (REXX), which is an interpretive language.

RMF. Resource Measurement Facility.

RODM. Resource Object Data Manager.

S

SAF. Security Authorization Facility.

SA z/OS. System Automation for z/OS

SA z/OS customization dialogs. An ISPF application through which the SA z/OS policy administrator defines policy for individual z/OS systems and builds automation control data and RODM load function files.

SA z/OS customization focal point system. See *focal point system*.

SA z/OS data model. The set of objects, classes and entity relationships necessary to support the function of SA z/OS and the NetView automation platform.

SA z/OS enterprise. The group of systems and resources defined in the customization dialogs under one enterprise name. An SA z/OS enterprise consists of connected z/OS systems running SA z/OS.

SA z/OS focal point system. See *focal point system*.

SA z/OS policy. The description of the systems and resources that make up an SA z/OS enterprise, together with their monitoring and automation definitions.

SA z/OS policy administrator. The member of the operations staff who is responsible for defining SA z/OS policy.

SA z/OS satellite. If you are running two NetViews on an z/OS system to split the automation and networking functions of NetView, it is common to route alerts to the Networking NetView. For SA z/OS to process alerts properly on the Networking NetView, you must install a subset of SA z/OS code, called an *SA z/OS satellite* on the Networking NetView.

SA z/OS SDF focal point system. See *focal point system*.

SCA. In SA z/OS, system console A, the active system console for a target hardware. Contrast with *SCB*.

SCB. In SA z/OS, system console B, the backup system console for a target hardware. Contrast with *SCA*.

screen. Deprecated term for display panel.

screen handler. In SA z/OS, software that interprets all data to and from a full-screen image of a target system. The interpretation depends on the format of the data on the full-screen image. Every processor and operating system has its own format for the full-screen image. A screen handler controls one PS/2 connection to a target system.

SDF. Status Display Facility.

SDLC. Synchronous data link control.

SDSF. System Display and Search Facility.

secondary system. A system is a secondary system for an application if it is defined to automation on that system, but the application is not normally meant to be running there. Secondary systems are systems to which an application can be moved in the event that one or more of its primary systems are unavailable. SA z/OS does not start the application on its secondary systems.

server. A server is a workstation that shares resources, which include directories, printers, serial devices, and computing powers.

service language command (SLC). The line-oriented command language of processor controllers or service processors.

service processor (SVP). The name given to a processor controller on smaller System/370 processors.

service period. Service periods allow the users to schedule the availability of applications. A service period is a set of time intervals (service windows), during which an application should be active.

service threshold. An SA z/OS policy setting that determines when to notify the operator of deteriorating service for a resource. See also *alert threshold* and *warning threshold*.

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

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

shutdown automation. SA z/OS-provided automation that manages the shutdown process for subsystems by issuing shutdown commands and responding to prompts for additional information.

side. A part of a partitionable CPC that can run as a physical partition and is typically referred to as the A-side or the B-side.

Simple Network Management Protocol (SNMP). An IP based industry standard protocol to monitor and control resources in an IP network.

single image. A processor system capable of being physically partitioned that has not been physically partitioned. Single-image systems can be target hardware processors.

single-image (SI) mode. A mode of operation for a multiprocessor (MP) system that allows it to function as one CPC. By definition, a uniprocessor (UP) operates in single-image mode. Contrast with *physically partitioned (PP) configuration*.

SLC. Service language command.

SMP/E. System Modification Program Extended.

SNA. Systems Network Architecture.

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

SNMP. Simple Network Management Protocol (a TCP/IP protocol). A protocol that allows network management by elements, such as gateways, routers, and hosts. This protocol provides a means of communication between network elements regarding network resources.

solicited message. An SA z/OS message that directly responds to a command. Contrast with *unsolicited message*.

SSCP. System services control point.

SSI. Subsystem interface.

start automation. SA z/OS-provided automation that manages and completes the startup process for subsystems. During this process, SA z/OS replies to prompts for additional information, ensures that the startup process completes within specified time limits, notifies the operator of problems, if necessary, and brings subsystems to an UP (or ready) state.

startup. The point in time at which a subsystem or application is started.

status. The measure of the condition or availability of the resource.

status focal-point system. See *focal—point system*.

status display facility (SDF). The system operations part of SA z/OS that displays status of resources such as applications, gateways, and write-to-operator messages (WTORs) on dynamic color-coded panels. SDF shows spool usage problems and resource data from multiple systems.

steady state automation. The routine monitoring, both for presence and performance, of subsystems, applications, volumes and systems. Steady state automation may respond to messages, performance exceptions and discrepancies between its model of the system and reality.

structure. A construct used by z/OS to map and manage storage on a coupling facility. See cache structure, list structure, and lock structure.

subgroup. A named set of systems. A subgroup is part of an SA z/OS enterprise definition and is used for monitoring purposes.

SubGroup entry. A construct, created with the customization dialogs, used to represent and contain policy for a subgroup.

subplex. Situations where the physical sysplex has been divided into subentities, for example, a test sysplex and a production sysplex. This may be done to isolate the test environment from the production environment.

subsystem. (1) A secondary or subordinate system, usually capable of operating independent of, or asynchronously with, a controlling system. (2) In SA z/OS, an z/OS application or subsystem defined to SA z/OS.

subsystem interface. The z/OS interface over which all messages sent to the z/OS console are broadcast.

support element. A hardware unit that provides communications, monitoring, and diagnostic functions to a central processor complex (CPC).

support processor. Another name given to a processor controller on smaller System/370 processors; see *service processor*.

SVP. Service processor.

switches. ESCON directors are electronic units with ports that dynamically switch to route data to I/O devices. The switches are controlled by I/O operations commands that you enter on a workstation.

switch identifier. The switch device number (swchdevn), the logical switch number (LSN) and the switch name

symbolic destination name (SDN). Used locally at the workstation to relate to the VTAM application name.

synchronous data link control (SDLC). A discipline for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges may be duplex or half-duplex over switched or nonswitched links. The configuration of the link connection may be point-to-point, multipoint, or loop. SDLC conforms to subsets of the Advanced Data Communication Control Procedures (ADCCP) of the American National Standards Institute and High-Level Data Link Control (HDLC) of the International Standards Organization.

SYSINFO Report. An RMF report that presents an overview of the system, its workload, and the total number of jobs using resources or delayed for resources.

SysOps. System operations.

sysplex. A set of z/OS systems communicating and cooperating with each other through certain multisystem hardware components (coupling devices and timers) and software services (couple data sets).

In a sysplex, z/OS provides the coupling services that handle the messages, data, and status for the parts of a multisystem application that has its workload spread across two or more of the connected processors, sysplex timers, coupling facilities, and couple data sets (which contains policy and states for automation).

A Parallel Sysplex is a sysplex that includes a coupling facility.

sysplex application group. A sysplex application group is a grouping of applications that can run on any system in a sysplex.

sysplex couple data set. A couple data set that contains sysplex-wide data about systems, groups, and members that use XCF services. All z/OS systems in a sysplex must have connectivity to the sysplex couple data set. See also *couple data set*.

Sysplex Timer. An IBM unit that synchronizes the time-of-day (TOD) clocks in multiple processors or processor sides. External Time Reference (ETR) is the z/OS generic name for the IBM Sysplex Timer (9037).

system. In SA z/OS, system means a focal point system (z/OS) or a target system (MVS, VM, VSE, LINUX, or CF).

System Automation for z/OS. The full name for SA z/OS.

System Automation for OS/390. The full name for SA OS/390, the predecessor to System Automation for z/OS.

system console. (1) A console, usually having a keyboard and a display screen, that is used by an operator to control and communicate with a system. (2) A logical device used for the operation and control of hardware functions (for example, IPL, alter/display, and reconfiguration). The system console can be assigned to any of the physical displays attached to a processor controller or support processor. (3) In SA z/OS, the hardware system console for processor controllers or service processors of processors connected using SA z/OS. In the SA z/OS operator commands and configuration dialogs, SC is used to designate the system console for a target hardware processor.

System Display and Search Facility (SDSF). An IBM licensed program that provides information about jobs, queues, and printers running under JES2 on a series of panels. Under SA z/OS you can select SDSF from a pull-down menu to see the resources' status, view the z/OS system log, see WTOR messages, and see active jobs on the system.

System entry. A construct, created with the customization dialogs, used to represent and contain policy for a system.

System Modification Program/Extended (SMP/E). An IBM licensed program that facilitates the process of installing and servicing an z/OS system.

system operations. The part of SA z/OS that monitors and controls system operations applications and subsystems such as NetView, SDSF, JES, RMF, TSO, RODM, ACF/VTAM, CICS, IMS, and OPC. Also known as SysOps.

system services control point (SSCP). In SNA, the focal point within an SNA network for managing the configuration, coordinating network operator and problem determination requests, and providing directory support and other session services for end users of the network. Multiple SSCPs, cooperating as peers, can divide the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units and logical units within its domain.

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

System/390 microprocessor cluster. A configuration that consists of central processor complexes (CPCs) and may have one or more integrated coupling facilities.

T

TAF. Terminal access facility.

target. A processor or system monitored and controlled by a focal-point system.

target control task. In SA z/OS, target control tasks process commands and send data to target systems and workstations through communications tasks. A target control task (a NetView autotask) is assigned to a target system when the target system is initialized.

target hardware. In SA z/OS, the physical hardware on which a target system runs. It can be a single-image or physically partitioned processor. Contrast with *target system*.

target system. (1) In a distributed system environment, a system that is monitored and controlled by the focal-point system. Multiple target systems can be controlled by a single focal-point system. (2) In SA z/OS, a computer system attached to the focal-point system for monitoring and control. The definition of a target system includes how remote sessions are established, what hardware is used, and what operating system is used.

task. (1) A basic unit of work to be accomplished by a computer. (2) In the NetView environment, an operator station task (logged-on operator), automation operator (autotask), application task, or user task. A NetView task performs work in the NetView environment. All SA z/OS tasks are NetView tasks. See also *communications task*, *message monitor task*, and *target control task*.

telecommunication line. Any physical medium, such as a wire or microwave beam, that is used to transmit data.

terminal access facility (TAF). (1) A NetView function that allows you to log onto multiple applications either on your system or other systems. You can define TAF sessions in the SA z/OS customization panels so you don't have to set them up each time you want to use them. (2) In NetView, a facility that allows a network operator to control a number of subsystems. In a full-screen or operator control session, operators can control any combination of subsystems simultaneously.

terminal emulation. The capability of a microcomputer or personal computer to operate as if it were a particular type of terminal linked to a processing unit to access data.

threshold. A value that determines the point at which SA z/OS automation performs a predefined action. See *alert threshold*, *warning threshold*, and *error threshold*.

time of day (TOD). Typically refers to the time-of-day clock.

Time Sharing Option (TSO). An optional configuration of the operating system that provides conversational time sharing from remote stations. It is an interactive service on z/OS, MVS/ESA, and MVS/XA.

Time-Sharing Option/Extended (TSO/E). An option of z/OS that provides conversational timesharing from remote terminals. TSO/E allows a wide variety of users to perform many different kinds of tasks. It can handle short-running applications that use fewer sources as well as long-running applications that require large amounts of resources.

timers. A NetView command that issues a command or command processor (list of commands) at a specified time or time interval.

TOD. Time of day.

token ring. A network with a ring topology that passes tokens from one attaching device to another; for example, the IBM Token-Ring Network product.

TP. Transaction program.

transaction program. In the VTAM program, a program that performs services related to the processing of a transaction. One or more transaction programs may operate within a VTAM application program that is using the VTAM application program interface (API). In that situation, the transaction program would request services from the applications

program using protocols defined by that application program. The application program, in turn, could request services from the VTAM program by issuing the APPCCMD macro instruction.

transitional automation. The actions involved in starting and stopping subsystems and applications that have been defined to SA z/OS. This can include issuing commands and responding to messages.

translating host. Role played by a host that turns a resource number into a token during a unification process.

trigger. Triggers, in combination with events and service periods, are used to control the starting and stopping of applications in a single system or a parallel sysplex.

TSO. Time Sharing Option.

TSO console. From this 3270-type console you are logged onto TSO or ISPF to use the runtime panels for I/O operations and SA z/OS customization panels.

TSO/E. TSO Extensions.

U

UCB. The unit control block; an MVS/ESA data area that represents a device and that is used for allocating devices and controlling I/O operations.

unsolicited message. An SA z/OS message that is not a direct response to a command. Contrast with *solicited message*.

user task. An application of the NetView program defined in a NetView TASK definition statement.

Using. An RMF Monitor III definition. Jobs getting service from hardware resources (processors or devices) are **using** these resources. The use of a resource by an address space can vary from 0% to 100% where 0% indicates no use during a Range period, and 100% indicates that the address space was found using the resource in every sample during that period. See also *Workflow*.

V

view. In the NetView Graphic Monitor Facility, a graphical picture of a network or part of a network. A view consists of nodes connected by links and may also include text and background lines. A view can be displayed, edited, and monitored for status information about network resources.

Virtual Storage Extended (VSE). An IBM licensed program whose full name is Virtual Storage Extended/Advanced Function. It is an operating system that controls the execution of programs.

Virtual Telecommunications Access Method (VTAM). An IBM licensed program that controls communication and the flow of data in an SNA network. It provides single-domain, multiple-domain, and interconnected network capability. Its full name is Advanced Communications Function for the Virtual Telecommunications Access Method. Synonymous with *ACF/VTAM*.

VM/ESA. Virtual Machine/Enterprise Systems Architecture.

VM Second Level Systems Support. With this function, Processor Operations is able to control VM second level systems (VM guest systems) in the same way that it controls systems running on real hardware.

volume. A direct access storage device (DASD) volume or a tape volume that serves a system in an SA z/OS enterprise.

volume entry. A construct, created with the customization dialogs, used to represent and contain policy for a volume.

volume group. A named set of volumes. A volume group is part of a system definition and is used for monitoring purposes.

volume group entry. An construct, created with the customization dialogs, used to represent and contain policy for a volume group.

Volume Workflow. The SA z/OS Volume Workflow variable is derived from the RMF Resource Workflow definition, and is used to measure the performance of volumes. SA z/OS calculates Volume Workflow using:

```
                    accumulated
                       Using
Volume     =  ------------------------  * 100
Workflow %    accumulated + accumulated
                Using         Delay
```

The definition of **Using** is the percentage of time when a job has had a request accepted by a channel for the volume, but the request is not yet complete.

The definition of **Delay** is the delay that waiting jobs experience because of contention for the volume. See also *Address Space Workflow*.

VSE. Virtual Storage Extended.

VTAM. Virtual Telecommunications Access Method.

W

warning threshold. An application or volume service value that determines the level at which SA z/OS changes the associated icon in the graphical interface to the warning color. See *alert threshold*.

workflow. See *Address Space Workflow* and *Volume Workflow*.

workstation. In SA z/OS workstation means the *graphic workstation* that an operator uses for day-to-day operations.

write-to-operator (WTO). A request to send a message to an operator at the z/OS operator console. This request is made by an application and is handled by the WTO processor, which is part of the z/OS supervisor program.

write-to-operator-with-reply (WTOR). A request to send a message to an operator at the z/OS operator console that requires a response from the operator. This request is made by an application and is handled by the WTO processor, which is part of the z/OS supervisor program.

WTO. Write-to-Operator.

WTOR. Write-to-Operator-with-Reply.

WWV. The US National Institute of Standards and Technology (NIST) radio station that provides standard time information. A second station, known as WWVB, provides standard time information at a different frequency.

X

XCF. Cross-system coupling facility.

XCF couple data set. The name for the sysplex couple data set prior to MVS/ESA System Product Version 5 Release 1. See also *sysplex couple data set*.

XCF group. A set of related members that a multisystem application defines to XCF. A member is a specific function, or instance, of the application. A member resides on one system and can communicate with other members of the same group across the sysplex.

XRF. Extended recovery facility.

Numerics

390-CMOS. Processor family group designator used in the SA z/OS processor operations documentation and in the online help to identify any of the following S/390 CMOS processor machine types: 9672, 9674, 2003, 3000, or 7060. SA z/OS processor operations uses the OCF facility of these processors to perform operations management functions. See *OCF-based processor*.

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Planning and Installation
Version 3 Release 1

Publication No. SC33-8261-01

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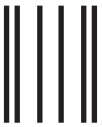

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