System Automation for z/OS
Version 3 Release 4

Planning and Installation

SC34-2645-00

Note!

Before using this information and the product it supports, read the information in Appendix K, “Notices,” on page 237.

This edition applies to IBM Tivoli System Automation for z/OS (Program Number 5698-SA3) Version 3 Release 4, an IBM licensed program, and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC34-2571-02.

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Accessibility

Publications for this product are offered in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when using PDF files, you may view the information through the z/OS® Internet Library website or the z/OS Information Center. If you continue to experience problems, send an email to mhvrcfs@us.ibm.com or write to:

IBM® Corporation
Attention: MHVRCFS Reader Comments
Department H6MA, Building 707
2455 South Road
Poughkeepsie, NY 12601-5400
U.S.A.

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 or Library Server versions of z/OS books in the Internet library at:

`http://www.ibm.com/systems/z/os/zos/bkserv/`

Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users accessing the Information Center using a screen reader. In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line, because they can be considered as a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that your screen reader is set to read out punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number 3.1) are mutually exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, you know that your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The * symbol can be used next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is given the format 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol giving information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, this indicates a reference that is defined elsewhere. The string following the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you should refer to separate syntax fragment OP1.

The following words and symbols are used next to the dotted decimal numbers:

- ? means an optional syntax element. A dotted decimal number followed by the ? symbol indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that syntax elements NOTIFY and UPDATE are optional; that is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

- ! means a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicates that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the same dotted decimal number can specify a ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In this example, if you include the FILE keyword but do not specify an option, default option KEEP will be applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP only applies to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.
- * means a syntax element that can be repeated 0 or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1* data area, you know that you can include one data area, more than one data area, or no data area. If you hear the lines 3*, 3 HOST, and 3 STATE, you know that you can include HOST, STATE, both together, or nothing.

  Notes:

  1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
  2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you could write HOST STATE, but you could not write HOST HOST.
  3. The * symbol is equivalent to a loop-back line in a railroad syntax diagram.
- + means a syntax element that must be included one or more times. A dotted decimal number followed by the + symbol indicates that this syntax element must be included one or more times; that is, it must be included at least once and can be repeated. For example, if you hear the line 6.1+ data area, you must include at least one data area. If you hear the lines 2+, 2 HOST, and 2 STATE, you know that you must include HOST, STATE, or both. Similar to the * symbol, the + symbol can only repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the * symbol, is equivalent to a loop-back line in a railroad syntax diagram.

How to send your comments to IBM

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1. Send an email to s390id@de.ibm.com
2. Visit the SA z/OS home page at http://www.ibm.com/systems/z/os/zos/features/system_automation/
3. Visit the Contact z/OS web page at http://www.ibm.com/systems/z/os/zos/webqs.html
4. Mail the comments to the following address:
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5. Fax the comments to us as follows:
   From Germany: 07031-16-3456
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  SC34-2645-00
- The topic and page number related to your comment
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Do not use the feedback methods listed above. Instead, do one of the following:

- Contact your IBM service representative
- Call IBM technical support
- Visit the IBM zSeries support web page at www.ibm.com/systems/z/support/.

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.

It also describes how to migrate to the latest release of SA z/OS.

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 z/OS*.

Where to Find More Information

The System Automation for z/OS Library

Table 1 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	SC34-2645
IBM Tivoli System Automation for z/OS Customizing and Programming	SC34-2644
IBM Tivoli System Automation for z/OS Defining Automation Policy	SC34-2646
IBM Tivoli System Automation for z/OS User's Guide	SC34-2647
IBM Tivoli System Automation for z/OS Messages and Codes	SC34-2648
IBM Tivoli System Automation for z/OS Operator's Commands	SC34-2649
IBM Tivoli System Automation for z/OS Programmer's Reference	SC34-2650
IBM Tivoli System Automation for z/OS Product Automation Programmer's Reference and Operator's Guide	SC34-2643
IBM Tivoli System Automation for z/OS TWS Automation Programmer's Reference and Operator's Guide	SC34-2651
IBM Tivoli System Automation for z/OS End-to-End Automation Adapter	SC34-2652
IBM Tivoli System Automation for z/OS Monitoring Agent Configuration and User's Guide	SC34-2653

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/systems/z/os/zos/features/system_automation

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/systems/z/os/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®, z/VSE®, and Clusters for AIX® and Linux:

- The Internet. You can access IBM message explanations directly from the LookAt Website at www.ibm.com/systems/z/os/zos/bkserv/lookat/index.html
- 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* (SK3T-4271) 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 www.ibm.com/systems/z/os/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* (SK3T-4271).
- The LookAt Website (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.

Summary of Changes for SC34-2645-00

This document contains information previously presented in System Automation for z/OS V3.3.0 Planning and Installation, SC34-2571-02.

New Information

The following information has been added:

- A description of the zEnterprise® hardware environment is added in “The zEnterprise™ BladeCenter® Extension (zBX)” on page 16 of Chapter 3, “Planning to Install SA z/OS on Host Systems,” on page 13.
- A description of how Processor Operations uses HTTP connections for the HMCs and the WebServices API is added in “Understanding the Processor Operations HTTP Interface” on page 18 of Chapter 3, “Planning to Install SA z/OS on Host Systems,” on page 13.
- Details for handling firewall connections for zEnterprise ensembles are added in “TCP/IP Firewall-Related Information” on page 37 of Chapter 5, “Planning for Automation Connectivity,” on page 31.
- A new step is inserted for managing zEnterprise hardware installation. See “Step 8: Preparing Ensemble HMC Communication” on page 82 and a supporting appendix for Hardware Management Console setup is provided in Appendix H, “Ensemble Hardware Management Console Setup,” on page 225.
- Further security details for Processor Hardware Functions with Ensemble Access are added in “Controlling Access to the Processor Hardware Functions” on page 160 of Appendix A, “Security and Authorization,” on page 153.
- A new step is inserted for installing Relational Data Services (RDS). See “Step 29: Install Relational Data Services (RDS)” on page 124.
- Instructions for restricting access to the Joblog Monitoring Task INGJLM are given in “Restricting Access to Joblog Monitoring Task INGJLM” on page 157 to protect sensitive data.
- An new step for adding function packages for NetView and TSO is added as “Step 15: Install Function Packages for NetView and TSO” on page 98.
- An new step for configuring capacity changes within step 7 is added as “Step 7E Preparing the SE (Console Workplace 2.10 and Later Versions)” on page 82.
- The parameter ARMWAIT has been added to the HSAPRM00 sample member. See Appendix I, “Syntax for HSAPRM00,” on page 229.
- Step 12B has been added for logging modifications during APAR apply in “Step 13: Install ISPF Dialog Panels” on page 92.
- References to IMS™ module access for IMS type 2 commands have been added in “Step 31: Install IMS Automation in IMS” on page 127.

Changed Information

The following information has been changed:

- References to the Hierarchical File System (HFS) are amended to USS to reflect the zFS file system in use under z/OS.
- A new variable &*JOBNAME. replaces the &SUBSJOB variable as described in “NetView Automation Table Migration” on page 210.
- Details of the functional prerequisites have been updated for SA z/OS 3.4 , see “Functional Prerequisites” on page 5.

Moved Information

The information in the section “Supported Software” has been moved to the table in “Functional Prerequisites” on page 5.

Information about access authorization levels for I/O operations commands has been moved from *IBM Tivoli System Automation for z/OS Operator's Commands* and added to the section “Defining a RACF Profile for I/O Operations” on page 164.

A new appendix Appendix B, “Planning for the NMC Environment,” on page 171 is created from the contents of former Chapter 5 of this document.

You may notice changes in the style and structure of some content in this document—for example, headings that use uppercase for the first letter of initial words only, and procedures that have a different look and format. The changes are ongoing improvements to the consistency and retrievability of information in our documents.

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

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)

  I/O-Ops manages ESCON® and FICON® Directors (Switch Directors for short).

Refer to “Component Description” on page 13 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 Tivoli NetView for z/OS, Version 5 Release 3.

SA z/OS System Operations

The system operations base program can run on any processor supported by Tivoli NetView for z/OS, V5.3 and z/OS Version 1 Release 11.

SA z/OS I/O Operations

The I/O operations base program can run on any processor supported by z/OS V1.11.

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 z/OS, V5.3.

Functional Prerequisites

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

- System z®
- 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

Note: For CMOS-S/390 G3 and G4 processors, MCL support is no longer available.

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 V1.11 or later.
Tivoli NetView for z/OS, V5.3

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:	
HTML browser	For customization reports
z/VM 4.3, or later	For VM Second Level Systems support
PTF UA31443 on z/OS V1.7 or z/OS V1.8, or later with z/OS XML System Services	OMEGAMON® XE Support
IBM Tivoli OMEGAMON II for MVS V5.2, or later IBM Tivoli OMEGAMON II for CICS V5.2, or later IBM Tivoli OMEGAMON II for IMS V5.1, or later IBM Tivoli OMEGAMON II for DB2 V5.4, or later	For the following commands: • INGMTRAP • INGOMX
IBM Tivoli Monitoring Services (ITMS, 5698-A79)	SA z/OS Monitoring Agent for Tivoli Enterprise Portal support (FMID HKAH320, see also *IBM Tivoli System Automation for z/OS Monitoring Agent Configuration and User's Guide*)
IBM CICS Transaction Server for z/OS V3.1, or later	For integrated automation of CICS address spaces and CICSPlex®-based monitoring
IBM DB2 for z/OS V8.1, or later	For integrated automation of DB2 address spaces
IBM IMS V10.1, or later	For integrated automation of IMS address spaces
IBM TWS for z/OS V8.2, or later	For integrated automation of TWS address spaces
Workstation Prerequisites:	
IBM Tivoli Enterprise Console V3.9, or later	For event notification
IBM Tivoli Business Service Manager for z/OS V4.2	For event notification
IBM Tivoli Netcool/OMNIbus V7.1, or later	For event notification

Supported Hardware

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

- System z, zSeries and CMOS-S/390processors.
- 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 ISPF V4.2 or higher. This is required for access to SA z/OS I/O operations functions and the SA z/OS customization dialogs.

The SA z/OS customization dialogs must be used with a terminal type of 3278.

Supported Operating Systems

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 V2.2 or higher), z/VM
- VM/SP V6.0, VM/XA V2.1, VM/ESA® V1.1.0
- VSE/SP V4.1, VSE/ESA V1.1.0 or higher
- LINUX of distributions providing Linux for zSeries and S/390 support

Note: The above products may no longer be serviced.

Chapter 2. What Is New in SA z/OS 3.4

This chapter contains an overview of the major changes to SA z/OS for Version 3 Release 4. Use this information to check the impact on your user-written programming interfaces, such as automation procedures.

You should also see Appendix F, “Migration Information,” on page 203 for details of how to migrate to SA z/OS V3.4.

IBM zEnterprise BladeCenter Extension support

The IBM zEnterprise System offers a revolutionary system design that addresses the complexity and inefficiency in today’s multi-architecture data centers. The zEnterprise extends the strengths and capabilities of the mainframe—such as security, fault tolerance, efficiency, virtualization and dynamic resource allocation—to other systems and workloads running on AIX on POWER7®, and Microsoft Windows or Linux on System x®—fundamentally changing the way data centers can be managed. The zEnterprise GA2 HW deliverables add a number of new Operations Management functions (HMC Web Services API) representing the new multi-architecture capabilities. IBM zEnterprise BladeCenter® Extension support addresses these items in SA z/OS. The available automation in SA z/OS, GDPS®, and user-written automation based on the SA z/OS processor operations APIs, enables the management of these advanced HW features. These include:

- Discovering and querying of the zBX components
- Activating and deactivating of the zBX blades and virtual servers (power-vm and x-hyp)
- Monitoring and automating of the zBX component’s notifications.

ISQECMD zEnterprise Operator Command

A new command called ISQECMD has been introduced that allows the operator or automation script to query zBX object containers, such as Blade Centers, or manipulate zBX objects (Blades, Virtual Hosts, Virtual Servers and so on). The command can be used to activate/deactivate Blades and Virtual Servers or to query the settings of various objects.

Runmodes

The concept of runmodes is introduced that allows a staged IPL or system shutdown where only a subset of the resources are started or stopped. The concept can also be used to switch from one environment to another, for example from a normal mode into a disaster recovery mode. A new command named INGRUN is introduced enabling a switch from one mode to another.

Joblog Monitoring

Messages produced by an application and written to the Joblog or a spooled data set but not WTO'ed to syslog can be made available for automation. A new attribute for the APL policy object is added that defines whether joblog monitoring should be done and the filter criteria for such a message. Only messages matching the filter criteria are forwarded to automation.

TEP Topology View

A new workplace has been introduced in the Tivoli Enterprise Portal (TEP) showing the dependencies a given resource has to other resources including their status. The workspace helps the operator to notice unusual behaviour or to spot mis-configurations previously done in the customization dialog.

Rolling Recycle

The INGGROUP command has been enhanced enabling the recycle of multiple members of a server group in parallel.

Concurrent Batch Command Receiver

The Batch command receiver has been enhanced to enable concurrent usage of the command receiver. This allows parallel processing of the commands submitted from batch jobs.

Extended Status Command

New policy controls are introduced to take actions when the resource reaches the UP state based on the state (up or down) of another resource. This is useful for resources that are dependent on each other.

Garbage Collector

The INGCLEAN command has been introduced to remove policy objects that became obsolete from the runtime data model. The command can be used by the installation when required, usually after refreshing the configuration.

SDF Enhancements

The dynamic panel generation function has been enhanced to compose a panel showing different system aspects, for example, subsystem data, exceptional data and WTORs. This is done by supporting multiple BODY sections in a panel.

A new exit AOFEXX05 has been introduced that allows the installation to replace user variables defined in the SDF tree/panel definitions based on the system for which the tree/panels are generated.

ProcOps managed resources such as processors, LPARs and ensembles are stored in SDF.

Customization Dialogs Enhancements

The visualization of the minor resource automation flag and thresholds are changed to show whether the settings are inherited from the class definitions.

Relational Data Services

A new command INGRDS has been introduced that provides a simple relational data management facility for automation scripts running within NetView/SA. The INGRDS command provides basic access methods for relational data tables. It is close to the concept of relational data framework but without the full SQL language parser.

Autodiscovery Utility

A discovery utility has been introduced that creates the SA z/OS policy database from the installation environment. The utility extracts the relevant data for automation from the active address spaces and correlates the discovered data with the SA z/OS samples policy to build up the policy and make it ready for use. The main use of the discovery tool is for installing and setting up SA z/OS the first time.

Command Enhancements

- The Sys-Ops commands are changed to exploit all of the 3270 supported screen sizes (24/32/43*80, 27*132, 62*160).
- The AOFCPMSG command is enhanced to enable the deletion of one or more messages that became obsolete while capturing a new message.
- The DISPGW command is introduced showing additional information for the remote systems such as primary/backup focal point, sysplex name, system name, SMFid, and so on.
- The INGCFG command is introduced to allow the deletion of the history data associated with a resource.
- The INGDATA command is enhanced to support additional filter criteria similar to the filter parameters of the INGLIST command.
- The INGEXEC command is enhanced to support the resource description as filter criteria as well as enhanced wildcarding for the SUBTYPE parameter. The TERMMSG and CORRWAIT parameters are added to control the command submission more successfully.
- The INGIMS command is enhanced to display the IMS dependent control regions of the control region as well as the TCO information associated with the control region.
- The INGLIST command is enhanced to support additional filter criteria such as jobname, runtoken, description and so on.
- The INGMSGS command is enhanced to enable the deletion of previously captured messages based on several criteria such as message id and/or age.
- The INGSET command is enhanced by introducing the EXPIRED option that allows the cancellation of start/stop requests when exceeding a certain age.
- The INGTHRES command is enhanced to allow the deletion of the threshold definitions in linemode.
- The MDFYSHUT command is enhanced so it can be called from NetView Automation Table to shorten/enlarge the shutdown interval or to abort the shutdown process.

Status Display Facility (SDF) Message Set

The Status Display Facility (SDF) now has its own message set. Refer to the following table:

Table 4. SDF Message Table (AOF/AOFS)

Previous Message Number (AOF)	New Message Number (AOFS)
AOF001I	AOFS010I AOFS011I
AOF002I	AOFS095I
AOF008I	-

Table 4. SDF Message Table (AOF/AOFS) (continued)

Previous Message Number (AOF)	New Message Number (AOFS)
AOF009I	AOFS500I
AOF013I	AOFS501I AOFS502I
AOF014I	AOFS503I
AOF017I	AOFS504I
AOF020A	AOFS810I AOFS811I AOFS812I AOFS813I
AOF023I	AOFS020I
AOF025I	AOFS505I
AOF030I	AOFS002I
AOF031I	AOFS021I AOFS022I
AOF033I	AOFS506I
AOF034I	AOFS507I
AOF035I	AOFS820I
AOF036I	AOFS023I
AOF037I	AOFS508I
AOF038I	AOFS509I
AOF039I	AOFS510I
AOF041I	AOFS030I AOFS031I
AOF042I	AOFS511I
AOF043I	AOFS001I
AOF044I	AOFS002I
AOF045I	AOFS004I
AOF046I	AOFS800E
AOF047I	AOFS005I
AOF049I	AOFS801E
AOF050I	AOFS006I
AOF051I	AOFS802E
AOF054I	AOFS007I
AOF055I	AOFS008I
AOF056I	AOFS009I
AOF068I	AOFS512I
AOF069I	AOFS000I
AOF183I	AOFS513I
AOF190I	AOFS090I
AOF191I	AOFS091I
AOF192I	AOFS092I
AOF194I	AOFS093I
AOF195I	AOFS094I
AOF197I	AOFS514I
AOF198I	AOFS515I AOFS516I
AOF630I	AOFS098I

Table 4. SDF Message Table (AOF/AOFS) (continued)

Previous Message Number (AOF)	New Message Number (AOFS)
AOF631I	AOFS099I

Chapter 3. 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)

  I/O-Ops manages ESCON and FICON Directors (Switch Directors 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, zEnterprise BladeCenter Extensions hardware (zBX) and VM guest systems operations. It provides a connection from a focal point processor to a target processor or a HMC. With NetView on the focal point processor, processor operations automates operator and system consoles for monitoring and recovering target processors and blade centers.

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. With the ensemble processor operations commands you can discover, monitor and manage the advanced HW features like a blades, virtual servers and workloads.

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.

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.

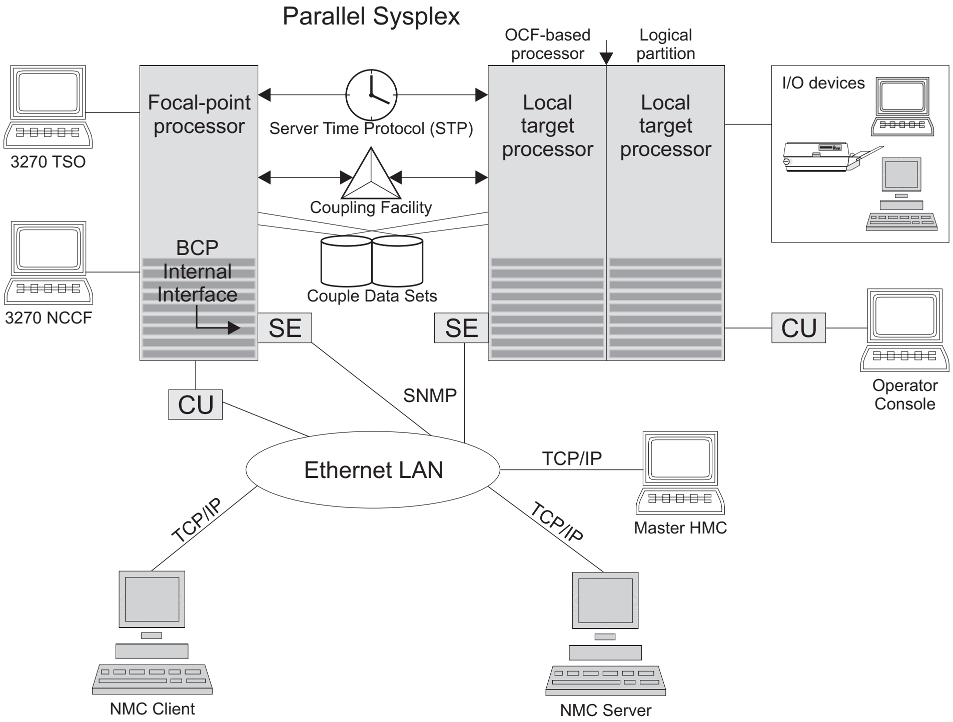


Figure 1. Basic Hardware Configuration

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.

Operators can also use SA z/OS Tivoli Enterprise Portal (TEP) support to monitor the status of automation on z/OS systems and z/OS sysplexes from a workstation that has a TEP client installed on it.

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 TCP-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 sections describe some relevant resources that are 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 sysplexwide 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”.

The zEnterprise™ BladeCenter® Extension (zBX)

An infrastructure component of the zEnterprise that houses and supports selected IBM blade servers and workload optimizers. zBX is the new infrastructure for extending System z qualities of service and management capabilities across a set of integrated, fit-for-purpose POWER7 and IBM® System x® compute elements in the zEnterprise System. For more information refer to:

http://www-03.ibm.com/systems/z/hardware/zenterprise/zbx.html

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 31.

SNMP

SNMP may be chosen as the protocol for communications between the processor operations focal point and the SE or HMC.

See also “Understanding the Processor Operations SNMP Interface” on page 19.

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 18.

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 20.

HTTP

HTTP may be chosen as the protocol for communications between the processor operations focal point and the ensemble HMC of a zEnterprise Ensemble supporting the zBX BladeCenters.

See "Understanding the Processor Operations HTTP Interface" on page 18.

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

Tivoli Enterprise Portal Support

SA z/OS Tivoli Enterprise Portal (TEP) support allows you to monitor the status of automation on z/OS systems and z/OS sysplexes using a TEP client. The client is the user interface for an SA z/OS monitoring agent. The monitoring agent uses Tivoli Monitoring Services infrastructure, which provides security, data transfer and storage, notification mechanisms, user interface presentation, and communication services for products in the IBM Tivoli Monitoring and OMEGAMON XE suites in an agent-server-client architecture.

The monitoring agent is installed on the systems or subsystems in the sysplex that you want to monitor and passes data to a hub Tivoli Enterprise Monitoring Server (monitoring server), which can be installed on z/OS, Windows, and some UNIX operating systems. The monitoring server communicates with the Tivoli Enterprise Portal Server (portal server), which then communicates with the portal client.

For more details, see *IBM Tivoli System Automation for z/OS Monitoring Agent Configuration and User's Guide*.

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 sysplexwide 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:

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

Using the BCP internal interface from MVS allows you to send hardware operations commands 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. Exceptions to this are the processor operations common commands for LPAR management, see the chapter “Common Commands” in *IBM Tivoli System Automation for z/OS Operator's Commands* for details.

Understanding the Processor Operations HTTP Interface

Using the HTTP interface of the processor operations, you can monitor and control ensemble zBX hardware from a processor operations focal point NetView in an IP network environment. With the processor operations HTTP interface, the following ensemble objects can be discovered and managed:

- zBX Blade Centers
- zBX Blades
- Virtualization hosts (“power-vm” and “x-hyp”)
- Virtual servers (“power-vm” and “x-hyp”)
- Workloads

As an extension to the BCP internal interface and SNMP, its purpose is to support the management commands (for example, ACTIVATE, DEACTIVATE) provided by the HMC Web Services API.

The Ensemble Hardware Management Console (HMC) of the ensemble you want to control must be configured for the Web Services API. Because this interface uses the SSL over IP network for communication between the processor operations focal point and the HMCs, the TCP/IP UNIX System Services stack with a running PAGENT and configured Application Transparent TLS (AT-TLS) are required to be active on the processor operations focal point system.

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:

- System z
- zSeries
- CMOS-S/390 G1 through G6

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 HW Console Automation Interface

The System z, zSeries, and CMOS-S/390 mainframes provide a console facility that the SA z/OS HW interfaces use to perform remotely either manual or automated operating system initialization and recovery. See Appendix E, “Using the HW Integrated Console of System z for External Automation with SA z/OS,” on page 191 for console definition, usage, performance, network, and basic information.

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 interface 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.

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 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=xxx
```

For more details, see “Step 14: Verify the Number of available REXX Environments” on page 98

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

z/OS Considerations

Prefixes

You should make sure you do not have any load modules, REXX parts or members with the following prefixes:

- AOF

- EVE
- EVI
- EVJ
- HSA
- IHV
- ING
- ISQ

Defining the XCF Group

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.

Systems with SA z/OS NetView instances that belong 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 that belong to the same XCF group must reside on different systems. Thus, when you run an SA z/OS 3.1 and an SA z/OS 3.2 agent 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 22). 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. In each subplex there must also be only one shared automation manager takeover file and one shared schedule override file.

With SA z/OS subplexes you can run automation on systems of sysplexes in the same way as 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.

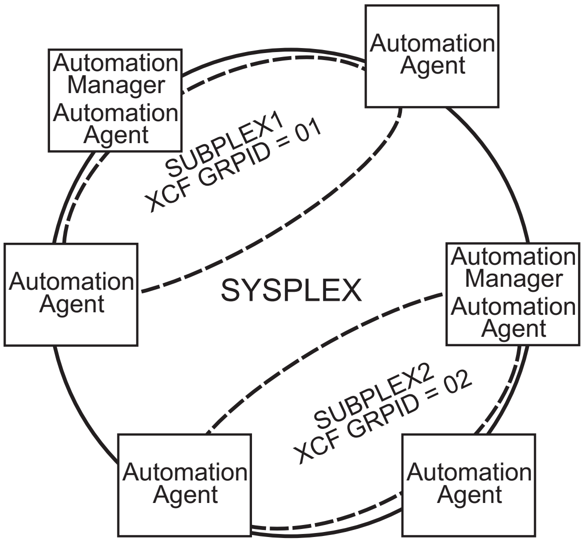


Figure 2. Using SA z/OS Subplexes

System Operations 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 the NetView style sheet, residing in the DSIPARM data set.

SA z/OS Hardware Interface: Important Considerations

The SA z/OS processor support commands and modules of Processor Operations and the BCP Internal Interface require a NetView task environment of CMD LOW to operate.

If you plan to use CMD HIGH task environments, be aware that ProcOps and BCPii function commands will not operate in such task environments. The ProcOps or BCPii function command will end prematurely with an error message that identifies the cause of the problem.

However you can still use NetView tasks with a CMD HIGH set for other purposes.

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 in 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 USS file system 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 18A: Build the Control Files” on page 104).

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, superuser authority cannot be evaluated until JES is up and consequently JES cannot be started by SA z/OS. With z/OS version 1.10 or higher this restriction is solved and the Automation

Manager can be initialized without JES and the need to be superuser. However BLOCKOMVS=YES still requires UID(0).

Recovery Concept for the Automation Manager

For sysplexwide 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 sysplexwide 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.

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.

Manager-Agent Communication and Status Backup

SA z/OS provides XCF for establishing communication between the automation manager and the automation agents, and a VSAM data set (the takeover file) for keeping a backup copy of the status of the automated resources.

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 3 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

Table 5 outlines the various recovery scenarios.

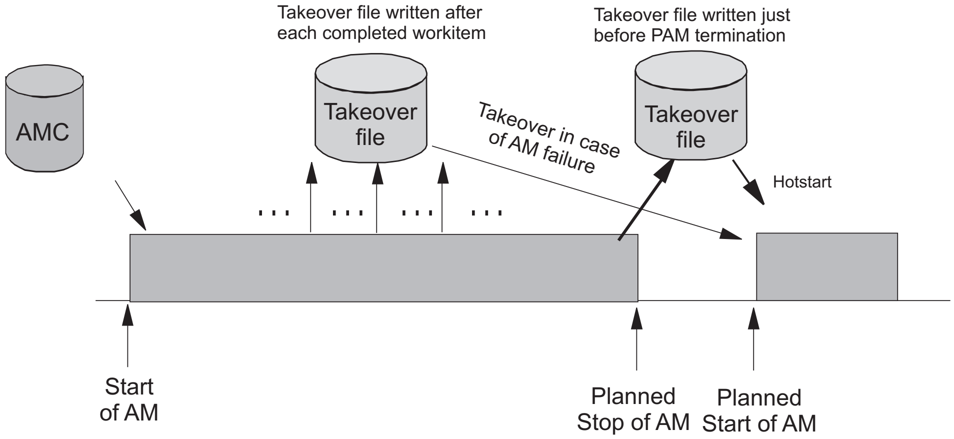

Takeover file written after each completed workitem
Takeover file written just before PAM termination
AMC
Takeover file
Takeover in case of AM failure
Takeover file
Hotstart
. . .
. . .
. . .
. . .
Start of AM
Planned Stop of AM
Planned Start of AM

Figure 3. Using Only the Takeover File for Status Backup

Table 5. 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 work item
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 hot start
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 hot start

Chapter 4. Planning to Install Alert Notification by SA z/OS

This section contains information required for the installation of alert notification by SA z/OS.

Introduction of Alert Notification by SA z/OS

SA z/OS alert notification is triggered by the invocation of the INGALERT command. It can be used to perform one ore more of the following tasks:

- Start notification escalation by IBM Tivoli System Automation for Integrated Operations Management (SA IOM)
- Display an event on a centralized operator console such as IBM Tivoli Enterprise Console (TEC) or IBM Tivoli Netcool/OMNIbus (OMNIbus)
- Create a trouble ticket in a service desk application such as IBM Tivoli Service Request Manager® (TSRM)
- Perform an arbitrary task in a user-defined alert handler

The following communication methods are available for alert notification:

- Use the peer-to-peer protocol of SA IOM to start a REXX script on the SA IOM server
- Send a Tivoli Event Integration Facility (EIF) event
- Send XML data the to IBM Tivoli Directory Integrator (TDI) and from there trigger the creation of the trouble ticket
- Pass parameters to the user-defined alert handler that is called as a NetView command

Note: EIF events and the TDI interface can be used to perform a variety of tasks or to integrate other operator consoles or service desk applications. The ones listed above are provided by SA z/OS as samples.

The behavior of INGALERT is controlled with the INGCNTL command at the system level, by a resource's Inform List at the resource level and even more granularly by CODE entries for the INGALERT entry in the MESSAGES/USER DATA policy item.

For details about the INGALERT and INGCNTL commands see *IBM Tivoli System Automation for z/OS Programmer's Reference*.

Alert Notification Infrastructure in SA z/OS

When INGALERT is called in a SA z/OS subplex the system tries to reach all specified targets by passing the request from one agent to another. If, for instance, INGALERT is called on SYS1 in order to start an SA IOM notification escalation, but SYS1 has no connection to the SA IOM server, the request is routed to SYS2 and SYS3 etc. until the SA IOM server can be reached.

This implies that you need not have all the connectivity to your distributed products on each system in the subplex, although you should have it at least on one, of course. This is true for all of the communication methods mentioned in "Introduction of Alert Notification by SA z/OS."

For details about the alert notification infrastructure see *IBM Tivoli System Automation for z/OS Customizing and Programming*.

Integration via SA IOM Peer-To-Peer Protocol

The integration of SA z/OS with SA IOM is based on the SA IOM peer-to-peer protocol. This requires that the SA IOM server must accept the system running the SA z/OS agent (or agents) as valid peers. For details about setting up SA IOM see *IBM Tivoli System Automation for Integrated Operations Management User's Guide*.

Through this protocol a REXX script is triggered on the SA IOM server that starts the notification escalation process asynchronously. A return code and eventually an error message are passed back to SA z/OS indicating whether the notification escalation could be started.

Note that it is not verified whether an operator can actually be notified by SA IOM.

To use integration via the SA IOM peer-to-peer protocol you must be able to set up a TCP/IP connection to the SA IOM server from at least one system that is running an SA z/OS agent.

See “Enabling Alert Notification via SA IOM Peer-To-Peer Protocol” on page 100.

Integration via EIF Events

SA z/OS can send out EIF events as the result of an INGALERT invocation. To create such an EIF event the message adapter of the IBM Tivoli Event/Automation Service (EAS) is used via the program-to-program interface (PPI).

To use integration via EIF events there must be an EAS on at least one system that is running an SA z/OS agent.

Because SA z/OS communicates only with EAS it does not matter which product receives the EIF event and which platform it is running on. There is, however, some customization required for these products.

For more details about how to set up the EAS and customize TEC and OMNIbus on Windows, see “Enabling Alert Notification via EIF Events” on page 100.

Integration via Trouble Ticket Information XML

When the creation of a trouble ticket is desired INGALERT sends XML data to a known URL (host and port). It is expected that the server sends back a response indicating success or failure and possibly an error message. It is irrelevant what kind of server this is and which platform it runs on. However, it is recommended that the server is a TDI Runtime Server. Samples are provided for this server and the customization is described in “Enabling Alert Notification via XML” on page 102.

To use integration via trouble ticket XML you must be able to set up a TCP/IP connection to a TDI server from at least one system that is running an SA z/OS agent.

Integration by User-defined Alert Handler

When INGALERT is told to inform a user-defined alert handler it calls the specified command synchronously in the NetView environment. Parameters are passed to the alert handler and a convention regarding return code and output messages must be obeyed. For details about the user-defined alert-handler see INGALERT in *IBM Tivoli System Automation for z/OS Programmer's Reference*.

To use integration by user-defined alert handler the code must be accessible from at least one system that is running an SA z/OS agent.

For more details see "Enabling Alert Notification via User-Defined Alert Handler" on page 102.

Chapter 5. 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 XCF 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. It is your decision whether you want to run the *Networking Automation* and the *System Automation* on separate NetViews.

Overview of Paths and Sessions

This section provides an overview of the following:
- “Message Forwarding Path” on page 32
- “Gateway Sessions” on page 32

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 4 shows a single gateway between two SA z/OS agents, ING01 and ING02.

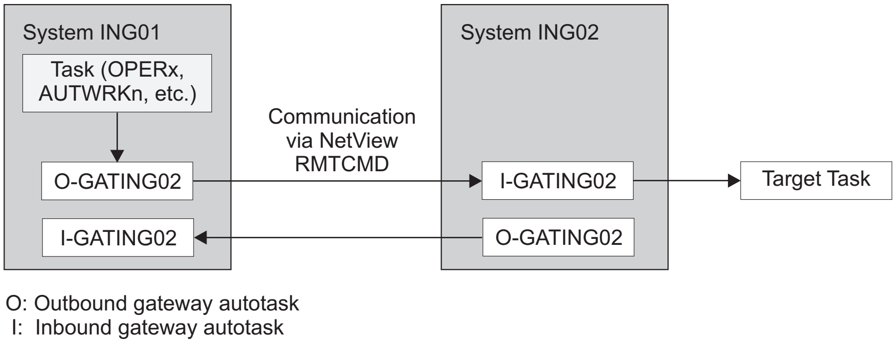

System ING01
Task (OPERx, AUTWRKn, etc.)
O-GATING02
I-GATING02
Communication via NetView RMTCMD
System ING02
I-GATING02
O-GATING02
Target Task
O: Outbound gateway autotask
I: Inbound gateway autotask

Figure 4. Single Gateway Example

There is one task handling all outbound data. This task is set up at SA z/OS initialization time. Normally the task has a name that begins with GAT and ends with the domain name. So for ING01, the gateway task is GATING01.

When VTAM becomes active, the gateway task (GATOPER) issues a CONNECT call to the remote system, ING02 in our example. If the GATING01 task on the remote system is not already active, it will be started automatically by NetView.

All requests initiated by system ING01 and destined for system ING02 use the task pair GATING01. Likewise all requests that originate on system ING02 and are destined for system ING01 use the pair GATING02. 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 5 on page 34 shows three systems: CHI01, ATL01, and ATL02. System CHI01 is the focal point for forwarding messages from target systems ATL01 and ATL02. In Figure 5 on page 34, gateways are designated as follows:

O Outbound gateway autotask

I Inbound gateway autotask.

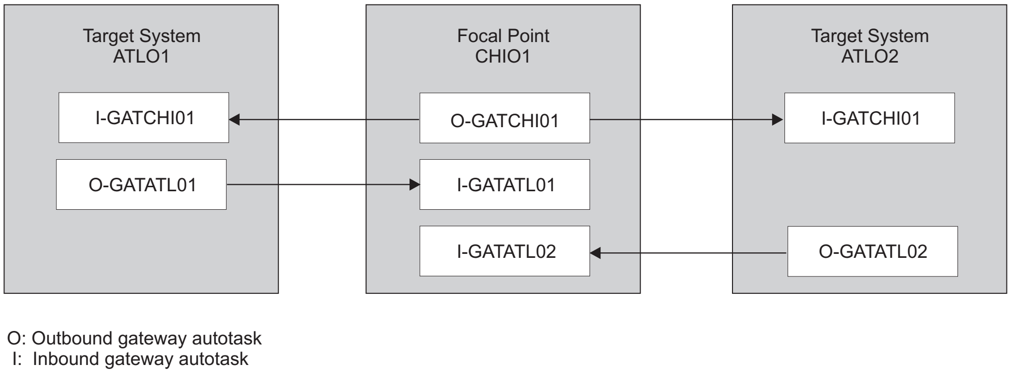


Figure 5. Example Gateways

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 that is executed periodically. The time interval is set in the **Gateway Monitor Time** field in the SYSTEM INFO 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) Fullscreen Sessions

Using the FULL SESSIONS policy item of the Network policy object, you can set up automatically-initiated terminal access facility (TAF) fullscreen 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 autotasksand TAF fullscreen 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:

- HTTP over TCP/IP (SSL)
- 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 System for HTTP Connections

If you plan to use a second focal point system for your processor operations HTTP connections, make sure that the TCP/IP stack and the PAGENT are always up and that your IP network allows the SSL communication between the alternate focal point and the ensemble HMCs.

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, TCP/IP and HTTP connections only)
- Recovery task
- Start task
- Polling 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

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

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

Recovery, Start, Polling and General Management 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.

The general management task is used for message automation in case the recovery task is not available because of other workloads.

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” and “Preparing the Alternate Focal Point System Connections” for focal point system connections
- “Preparing the Target System Connections” on page 38 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:

- HTTP over TCP/IP(SSL)
- 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 System z 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.

The TCP/IP HTTP ensemble connections of ProcOps use port numbers 6167 and 61612. These are the port numbers that the Hardware Management Consoles use to communicate with SA z/OS ProcOps or other applications using the Web Services API. In case you have firewalls installed between the processor LAN and the LAN that SA z/OS ProcOps belongs to, make sure ports 6167 and 61612 are registered to prevent HMC connections 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:

- HTTP over TCP/IP (SSL)
- SNMP
- TCP/IP

Connection Example

Figure 6 shows an alternate focal point system as well as a primary focal point system connected from an IP network to the processor hardware LAN.

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.

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

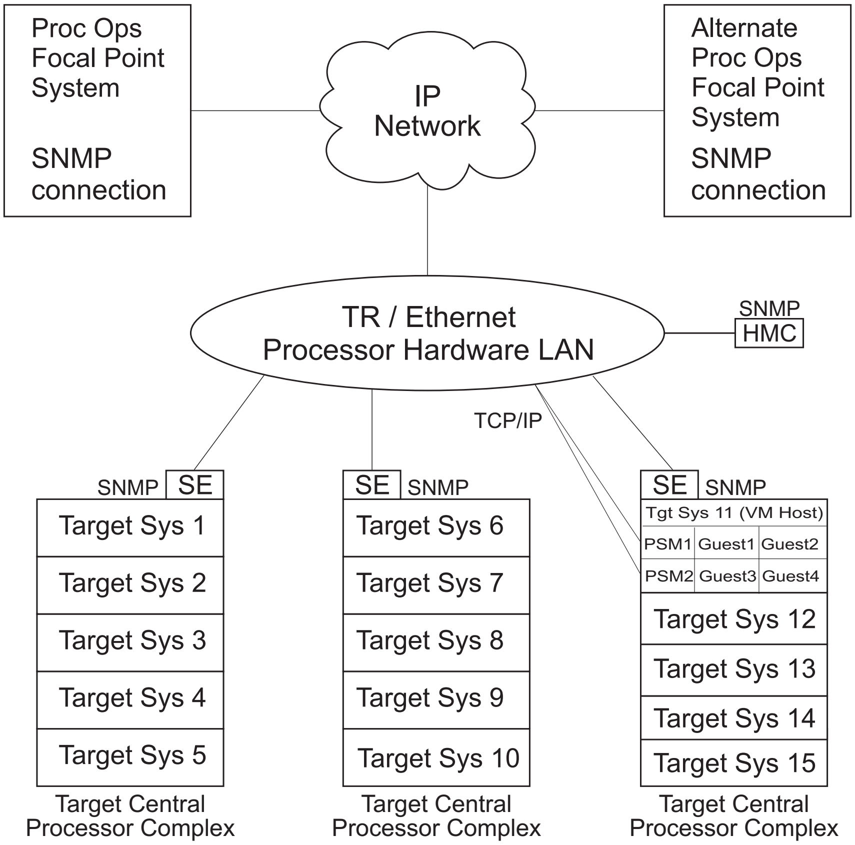


Figure 6. Alternate and Primary Focal Point System Connections from an IP Network to the Processor Hardware LAN

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 I/O-Ops on one system to make an operational change to an I/O resource, such as a shared Switch Director, it coordinates the change with other copies of I/O-Ops on other systems. This is especially important when the result of the action you are taking removes connectivity, that is, disables I/O paths, so that the systems do not lose access to critical resources. Each copy of I/O-Ops interacts with its local system image (for example, through VARY) so that the operating system has the chance to *vote* on the changes. If one system fails in VARYing the path of a device, I/O-Ops interprets this as a vote of *no* and fails the operation. This behavior is called *safe-switching* (see “Safe Switching” in *IBM Tivoli System Automation for z/OS Operator's Commands*). The copy of I/O-Ops that you initiated the operation from then interacts with the other copies on the affected system images to back out VARYs that were successful.

The copies of I/O-Ops 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 I/O-Ops functions on each system image need to intercommunicate by establishing TCP/IP or VTAM sessions between each other. All systems that share access to a given Switch Director should run I/O-Ops to provide safe-switching protection. Those copies of I/O-Ops 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-Ops to force two copies of I/O-Ops that do not share any Switch Directors to establish communications. This is useful if you want to benefit from the I/O-Ops 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 Switch Directors or have no reason to share them.

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

To enable the VTAM sessions, you must create VTAM definitions as described in “Step 19B: Perform VTAM Definitions” on page 105 to support communications between I/O-Ops 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 Switch Directors, you should plan local procedures to use the I/O-Ops Reset Host function to force I/O-Ops applications to start the sessions.

Chapter 6. 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 in 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 because 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.

Switch Director Ports

This section offers suggestions for naming Switch Director ports (dynamic switch ports) and fully utilizing these names in I/O-Ops 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-Ops 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 43.
- Allows you, when issuing I/O-Ops 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 44.

Suggestions for Naming Switch 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.

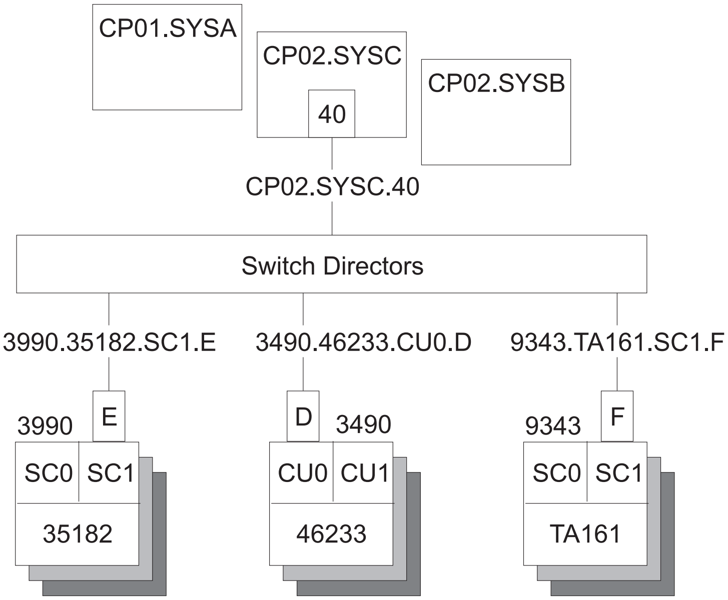


Figure 7. Examples of Port Names in a Configuration

Methods of Naming Ports

You can assign names to ports using the following methods:

- The WRITE command.

  You can use the following command to write the name CP01.SYSB.CHP38 to port D3 on switch 100:

  ```
  WRITE CP01.SYSB.CHP38 (D3) 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 to send a series of name assignments to a dynamic switch with, for example, the following commands:

  ```
  WRITE CP01.SYSB.CHP38 (D3) 100
  WRITE 3990.35182.SC1.E (F1) 100
  ```
- 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 following command blocks the port named 3490.46233.CU1.F on switch 100:

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

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

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

The following command looks for any switch that has both names, CP02.SYSC.CHP42 and 3490.46233.CU1.F:

```
PROHIBIT CP02.SYSC.CHP42 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

I/O-Ops 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, suppose you issue the following command:

```
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-Ops 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-Ops 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 7, “Installing SA z/OS on Host Systems,” on page 49
- Chapter 8, “Installing SA z/OS Workstation Components,” on page 139

Chapter 7. 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 8 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 document, 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 61 and “Step 4E: Update LNKLST*xx*” on page 61.

Overview of Installation Tasks

The major tasks required for installing SA z/OS on a focal point are listed in Table 6.

Table 6. Installation Tasks for SA z/OS Host Systems. ✓=Required, *=Optional

Task	SysOps	ProcOps	I/O Ops
“Step 1: SMP/E Installation” on page 52	✓	✓	✓
“Step 2: Allocate System-Unique Data Sets” on page 55	✓		✓
“Step 3: Allocate Data Sets for the ISPF Dialog” on page 58	✓	✓	✓
“Step 4: Customize SYS1.PARMLIB Members” on page 59	✓	✓	✓
“Step 5: Customize SYS1.PROCLIB Members” on page 63	✓	✓	✓
“Step 6: Customize NetView” on page 66	✓	✓	
“Step 7: Preparing the Hardware” on page 73	✓	✓	
“Step 8: Preparing Ensemble HMC Communication” on page 82		✓	
“Step 9: Preparing the VM PSM” on page 85		*	
“Step 10: Customizing the Automation Manager” on page 88	✓		
“Step 11: Customizing the Component Trace” on page 90	✓		✓
“Step 12: Customizing the System Logger” on page 91	*		
“Step 13: Install ISPF Dialog Panels” on page 92	✓	✓	✓
“Step 14: Verify the Number of available REXX Environments” on page 98	✓	✓	
“Step 15: Install Function Packages for NetView and TSO” on page 98	*		

Table 6. Installation Tasks for SA z/OS Host Systems (continued). ✓=Required, *=Optional

Task	SysOps	ProcOps	I/O Ops
"Step 16: Customization of Alert Notification for SA z/OS" on page 99	*		
"Step 17: Compile SA z/OS REXX Procedures" on page 102	*	*	
"Step 18: Defining Automation Policy" on page 103	✓	✓	
"Step 19: Define Host-to-Host Communications" on page 104	✓	✓	✓
"Step 20: Enabling SA z/OS to Restart Automatic Restart Manager Enabled Subsystems" on page 109	✓		
"Step 21: Define Security" on page 110	✓	✓	
"Step 22: Customize the Status Display Facility (SDF)" on page 111	*		
"Step 23: Check for Required IPL" on page 111	✓	✓	✓
"Step 24: Automate System Operations Startup" on page 112	✓	✓	
"Step 25: Verify Automatic System Operations Startup" on page 113	*		
"Step 26: Install an SA z/OS Satellite" on page 114	*		
"Step 27: Installing and Customizing the NMC Focal Point" on page 115	*	*	
"Step 28: Copy and Update Sample Exits" on page 124	*	*	
"Step 29: Install Relational Data Services (RDS)" on page 124	*		
"Step 30: Install CICS Automation in CICS" on page 125	*		
"Step 31: Install IMS Automation in IMS" on page 127	*		
"Step 32: Install TWS Automation in TWS" on page 128	*		
"Step 33: Install USS Automation" on page 131	*		
"Step 34: Customizing GDPS" on page 133	*		
"Step 35: Customizing I/O Operations" on page 135			✓
"Step 36: Installing Tivoli Enterprise Portal Support" on page 137	*		

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 about 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 7 shows a list of target data sets as provided by the SMP/E installation process to be used for production on your system.

Table 7. 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
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.SINGTREX	TSO REXX execs 4
ING.SINGPWS1	NMC exploitation code 5
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
| ING.SINGIMAP	Mapper files for Autodiscovery 7
ITM.TKANCUS	Installation CLISTs for Tivoli Enterprise Portal (TEP) support 8
ITM.TKANMODL	Load modules for TEP support 8
ITM.TKANDATV	Data files for TEP support 8
| ITM.TKANPAR	Parameter files for TEP support 8

Table 8 on page 54 shows a list of the USS directories that are provided by the SMP/E installation process.

Table 8. USS Paths

USS Path	Description
/usr/lpp/ing/adapter	Shell script 9
/usr/lpp/ing/adapter/lib	Executable 9
/usr/lpp/ing/adapter/config	Configuration file 9
/usr/lpp/ing/adapter/data	Customer data/empty at installation 9
/usr/lpp/ing/adapter/ssl	Customer data/empty at installation 9
/usr/lpp/ing/ussauto	Customer data/empty at installation 9
/usr/lpp/ing/ussauto/lib	USS automation executable file 9
/usr/lpp/ing/doc	SA z/OS-related documentation
/usr/lpp/ing/doc/policies	Best practice policy diagrams
/usr/lpp/ing/dist	For distributed connectors
/usr/lpp/ing/dist/tec	Tivoli Enterprise Console (TEC) related code
/usr/lpp/ing/dist/tdi	Tivoli Directory Integrator (TDI) related code
/usr/lpp/ing/dist/omnibus	Tivoli Netcool/OMNIbus-related code
/usr/lpp/ing/sap	SAP-related code

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 everyone that uses 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 everyone that uses the SA TSO REXX environment.

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

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

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

8 Data sets of this category are required for the Automated Discovery function.

9 These data sets are required for Tivoli Enterprise Portal support, where *&shilev* is the high-level qualifier of the SMP/E target libraries used. See also *IBM Tivoli System Automation for z/OS Monitoring Agent Configuration and User's Guide*.

10 Files in these directories are used for USS Automation and the end-to-end automation 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 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:

- INGALLC0
- INGALLC1
- INGALLC2
- INGALLC3
- INGALLC4
- INGALLC5
- INGALLC6

Prerequisite for running the jobs:

Before you run these jobs, you need to edit them to make them runnable in your specific environment. To do so, first copy them into your private user library and then follow the instructions that are given in the comments in the jobs.

Note that 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 NetView

SysOps	ProcOps	I/O Ops
✓		

The data sets in Table 9 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 5: Customize SYS1.PROCLIB Members” on page 63.

Table 9. Data Sets for Each Individual Automation Agent

Purpose	Sample job to allocate the data set	Organization	DD name in the NetView startup procedure
User-modified NetView system definitions.	INGALLC0	Partitioned	DSIPARM
Stores the NetView reports, listings, files, and output from the security migration tool as well as the reports from the style sheet report generator.	INGALLC0	Library	DSILIST
Contains the members to be used when testing the automation table.	INGALLC0	Partitioned	DSIASRC

Table 9. Data Sets for Each Individual Automation Agent (continued)

Purpose	Sample job to allocate the data set	Organization	DD name in the NetView startup procedure
Stores the output report produced from running tests of the automation table.	INGALLC0	Partitioned	DSIARPT
Contains VTAM source definitions for the sample network.	INGALLC0	Partitioned	DSIVTAM
NetView log data sets	INGALLC0	VSAM	DSILOGP, DSILOGS
NetView trace data set	INGALLC0	VSAM	DSITRCP, DSITRCS
DVIPA Workload Statistics	INGALLC0	Sequential	CNMDVIPP, CNMDVIPS
NetView save/restore data set	INGALLC0	VSAM	DSISVRT

Step 2B: Data Sets for I/O Operations

SysOps	ProcOps	I/O Ops
		✓

The data set in Table 10 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 5: Customize SYS1.PROCLIB Members” on page 63.

Table 10. Data Sets for I/O Operations

Purpose	Sample job to allocate the data set	Organization	DD name in the I/O operations startup procedure
HCD trace file	INGALLC1	Sequential	HCDTRACE

Step 2C: Data Sets for Automation Agents

SysOps	ProcOps	I/O Ops
✓		

The data sets in Table 11 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 5: Customize SYS1.PROCLIB Members” on page 63.

Table 11. Data Sets for Each Individual Automation Agent

Purpose	Sample job to allocate the data set	Organization	DD name in the NetView startup procedure
Automation status file	INGALLC2	VSAM	AOFSTAT
Dump file for diagnostic information	INGALLC2	Sequential	INGDUMP

The data set in Table 12 is required once per sysplex and cannot be shared across sysplex boundaries. It needs to be referred to in the startup procedure for each automation agent's NetView in “Step 5: Customize SYS1.PROCLIB Members” on page 63.

Table 12. Data Set for Each Sysplex

Purpose	Sample job to allocate the data set	Organization	DD name in the NetView startup procedure
IPL data collection	INGALLC4	VSAM	HSAIPL

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

SysOps	ProcOps	I/O Ops
✓		

The data sets in Table 13 are required once per sysplex or standalone system. In 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 5: Customize SYS1.PROCLIB Members” on page 63.

Each subplex requires one separate set of the following:

- The schedule override file
- The configuration information data set
- The automation manager takeover file

Table 13. Data Sets for All Automation Managers in a Sysplex or Standalone System

Purpose	Sample job to allocate the data set	Organization	DD name in the automation manager startup procedure
Schedule override file	INGALLC3	VSAM	HSAOVR
Configuration information data set	INGALLC3	Sequential	HSACFGIN
PARMLIB	INGALLC3	Partitioned	HSAPLIB
Takeover file	INGALLC3	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.			

The data sets in Table 14 on page 58 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.

Step 2: Allocate System-Unique Data Sets

These files also need to be referred to in the automation manager startup procedure in "Step 5: Customize SYS1.PROCLIB Members" on page 63.

Table 14. Data Sets for Each Individual Automation Manager

Purpose	Sample job to allocate the data set	Organization	DD name in the automation manager startup procedure
Internal trace files (optional)	INGALLC5	Sequential	TRACET0
	INGALLC5	Sequential	TRACET1
ALLOCOUT data set	INGALLC5	Sequential	SYSOUT
ALLOCPRT data set	INGALLC5	Sequential	SYSPRINT
DUMP data set for LE environment	INGALLC5	Sequential	CEEDUMP

The generation data groups (GDGs) in Table 15 must be created 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 create the GDGs for a particular sysplex or standalone system, make sure that you include a new set of GDG definitions for each automation manager that you plan to have on that particular sysplex or standalone system. For more details, see the comments in the INGALLC6 sample.

These files also need to be referred to in the automation manager startup procedure in "Step 5: Customize SYS1.PROCLIB Members" on page 63.

Table 15. Generation Data Groups for Each Individual Automation Manager

Purpose	Sample job to create the GDG	Organization	DD name in the automation manager startup procedure
Internal trace files	INGALLC6	Sequential	TRACET0
	INGALLC6	Sequential	TRACET1
ALLOCOUT data set	INGALLC6	Sequential	SYSOUT
ALLOCPRT data set	INGALLC6	Sequential	SYSPRINT
DUMP data set for LE environment	INGALLC6	Sequential	CEEDUMP

Step 3: Allocate Data Sets for the ISPF Dialog

SysOps	ProcOps	I/O Ops
✓	✓	✓

Use the sample job INGEDLGA in SINGSAMP to allocate data sets that are required for 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 and processor operations:**
  - The ISPF table library data set that contains the values you enter in the customization dialog
  - The SA z/OS configuration file: this is the output data set for the customization dialog when building the SA z/OS configuration.

Data Set Name	Purpose
ING.CUSTOM.AOFTABL	ISPF table output library for the customization dialog
ING.CUSTOM.SOCNTL	SA z/OS configuration files

- **For processor operations:**
  - The ISPF table library data set that contains the values you enter in the customization dialog
  - The SA z/OS configuration file: this is the output data set for the customization dialog when building the SA z/OS configuration.
  - The processor operations control file for SA z/OS 3.2 or earlier, generated using the customization dialog, which provides information about your processor operations configuration

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

- **For I/O operations:**
  - The I/O operations configuration file. Because 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. Because they do not support multisystem commands for I/O operations functions, you must install them on each system, focal point or target, where you want to use them.

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

Note: Make a note of these data set names. They are used in "Step 13: Install ISPF Dialog Panels" on page 92. If you rename the data sets, you need to adapt the corresponding names in that step.

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

The following sections describe the SYS1.PARMLIB data set members that need to be changed and provide information about how to achieve this.

Step 4A: Update IEAAPF*xx*

SysOps	ProcOps	I/O Ops
✓	✓	✓

| Define authorized libraries to the authorized program facility (APF) in an IEAAPFxx member.

Edit the IEAAPF*xx* member to add the following to the APF:

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

> **You can avoid an IPL:**
> You can also code a PROGxx member to add authorized libraries to the authorized program facility (APF). If you do this, no IPL is required. For a complete description of dynamic APF and PROGxx, see *z/OS MVS Initialization and Tuning Reference*.

Note: Do not include SYS1.NUCLEUS.

Step 4B: Update SCHED*xx*

SysOps	ProcOps	I/O Ops
✓		✓

Sample: INGESCH

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

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

I/O operations exploits the MVS component trace and stores intermediate trace records in a data space. Because some trace entries are recorded outside the I/O operations address space, the data space must be common to all users. However, a common data space requires the owning address space to be non-swappable.

Step 4C: Update MPFLST*xx*

SysOps	ProcOps	I/O Ops
✓	✓	

Sample: INGEMPF

It is recommended that you update the MPFLST*xx* member *after* having installed the ISPF Customization Dialog (see “Step 18: Defining Automation Policy” on page 103). Using the customization dialog you can obtain a list of the messages that are 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.

In addition SA z/OS provides a sample member called INGEMPF in the SINGSAMP sample library. This contains the IDs of all of the messages that occur in the INGMSGSA NetView automation table that is delivered with SA z/OS. Thus if you concatenate both the INGEMPF member and the dynamically-created MPFLSTSA member, you obtain a list of all of the messages that are used in the INGMSGSA and INGMSG01 automation tables.

Alternatively, update the content of your MPFLST*xx* member based on INGEMPF and INGMSGSA, and make sure that all of the messages that are listed there are forwarded to automation.

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:**
>
> Because 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. If you do this, no IPL is required. For a complete description of dynamic LPA and PROGxx, see *z/OS MVS Initialization and Tuning Reference*.

Notes:

1. Make sure that the SA z/OS load library is cataloged in the master catalog, or copy the members in ING.SINGMOD3 to a data set that 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, or HSA in these members.
3. If ING.SINGMOD3 is to be placed in SYS1.PARMLIB member LPALST*xx*, ensure the data set organization is of type PDS.

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 startup time.

Add SINGMOD1 (recommended) and SINGMOD2 (mandatory) to the LNKLST concatenation. There is no other choice for these libraries: they **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 that is 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 that are cataloged in user catalogs.

Edit the LNKLSTxx member to add the following to the LNKLST concatenation: ING.SINGMOD1, ING.SINGMOD2.

> **You can avoid an IPL:**
> You can also code a PROGxx member to add libraries to the LNKLST concatenation. If you do this, no IPL is required. For a complete description of dynamic LSTLNK and PROGxx, see *z/OS MVS Initialization and Tuning Reference*.

Step 4F: Update IEFSSN*xx*

SysOps	ProcOps	I/O Ops
✓	✓	

Sample: INGESSN

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 started task names. The four-character prefix that you specify must match the four-character prefix of the NetView started task names. For example, if you specify SYSV, the names of the NetView job name must be SYSV*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. Please adapt the content of your IEFSSNxx member accordingly. If you run NetView 5.x then define:

  ```
  SUBSYS SUBNAME(SYSV)       /* NETVIEW-SA SUBSYSTEM NAME             */
  ```

  If you run NetView 6.x, then define:

  ```
  SUBSYS SUBNAME(SYSV) /* NETVIEW-SA SUBSYSTEM NAME             */
    INITRTN(DSI4LSIT)
  ```

- To prevent JESx from starting before SA z/OS during the IPL process, indicate that in your IEFSSNxx member accordingly.

  ```
  SUBSYS SUBNAME(JES2)       /* JES2 IS THE PRIMARY SUBSYSTEM  NAME    */
     PRIMARY(YES) START(NO)
  ```

  However if you plan to start JESx before NetView, remove the START(NO) option from your definitions in the IEFSSNxx member. For the correct syntax of your environment check the *z/OS MVS Initialization and Tuning Reference*.

Step 4G: Update JES3IN*xx*

SysOps	ProcOps	I/O Ops
✓		

Sample: INGEJES3

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 4H: Update SMFPRM*xx*

SysOps	ProcOps	I/O Ops
*		

If you plan to use SMF records for availability reporting you must update the SMFPRM*xx* member in the SYS1.PARMLIB library by adding type 114 to the SYS(TYPE statement :

```
SYS(TYPE(30,...,114)
```

For the correct syntax of your environment check the *z/OS MVS Initialization and Tuning Reference*.

Step 5: Customize SYS1.PROCLIB Members

SysOps	ProcOps	I/O Ops
✓	✓	✓

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

Step 5A: 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:

  - Ensure that the PPIOPT parameter is set to PPI. Several SA z/OS functions use PPI communication as a base, for example, USS automation and Tivoli Enterprise Portal Support.
- **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 (for the focal point system as well as for the target systems).

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

– 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 55.

Note: Adaptation of the JCL procedure names to meet the four-character prefix defined in the IEFSSnxx member will be done in "Step 24: Automate System Operations Startup" on page 112 when defining the jobnames for Automation NetView.

If you do not make ING01 your domain name, make a note of what your NetView domain name is. This information is needed 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 about how to modify the NetView startup procedure.

Step 5B: 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 all systems where System Automation will be installed and run.

  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 55 include the data sets that you allocated there. In addition, consider customizing the following point:

  – 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 88):

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

  In place of `ING.PARMLIB`, use the PARMLIB data set that you allocated in "Step 2: Allocate System-Unique Data Sets" on page 55.

- **Other System Operations Startup Procedures**

  Copy the following members from the SINGSAMP data set to members of the SYS1.PROCLIB of all systems where System Automation will be installed and run:

  HSAPIPLC This procedure gathers IPL statistics and stores the information in the IPLDATA file. Once set up, you can view sysplex-wide IPL data with the command `INGPLEX IPL`.

  You can give the procedure any name.

It is recommended that you define this procedure in your automation policy as an application with the option 'START ON IPL ONLY'.

Alternatively, you can start this procedure during every IPL. This can be accomplished by adding `COM='S HSAPIPLC,SUB=MSTR'` to a COMMAND*xx* parmlib member that is shared by all systems in the sysplex.

INGPHOM This procedure is used internally by SA z/OS to process sysplex data for CF paths.

The procedure name must *not* be changed.

INGPIPLC This procedure is used internally by SA z/OS to compare IPL data.

The procedure name must *not* be changed.

INGPIXCU The procedure is used internally by SA z/OS to process sysplex data for Sysplex utilities (for example, Couple Data Set management, Coupling Facility management, and so on.). Once set up, you can view and manage related Sysplex CDS and CF data with the commands `INGPLEX CDS` and `INGPLEX CF`.

The procedure name must *not* be changed.

Follow the customization instructions that are contained in the HSAPIPLC member.

Note: 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 153.

- *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 5C: 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 (for the focal point system as well as for the target systems).

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

- 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 55.

Because 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 information about how to create that data set.

Step 6: Customize NetView

SysOps	ProcOps	I/O Ops
✓	✓	

This section discusses how to customize several aspects of NetView:

- "Step 6A: Customize NetView Alert Information"
- "Step 6B: Customize NetView DSIPARM Data Set"
- "Step 6C: Modifying NetView DSIPARM Definitions for an Automation Network" on page 71
- "Step 6D: Customize NetView for Processor Operations" on page 71
- "Step 6E: Customize the NetView Message Translation Table" on page 72
- "Step 6F: Add the INGRXFPG REXX Function Package" on page 72

Step 6A: 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.

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 in a startup CLIST or exit because they need to be issued after every NetView startup.

If you do not want to use the `SRF AREC PASS N *` command to allow *all* alerts to pass, you should, as a minimum, allow the NTFY event type (*etype*s) to pass.

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

Step 6B: Customize NetView DSIPARM Data Set

SysOps	ProcOps	I/O Ops
✓	✓	

Sample: INGSTGEN

A sample is provided for this step in the INGSTGEN member of the SINGSAMP library. Copy the contents of INGSTGEN to your C*xx*STGEN or C*xx*STUSR and customize it to match your installation. See the INGSTGEN sample for further details.

Copy any DSIPARM and SINGNPRM member that you need to customize into a data set allocated in DSIPARM before 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:

NetView Style Sheet

Tower Statements: The various SA z/OS components or environments are activated with the following TOWER.SA statements.

`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 Geographically Dispersed Parallel Sysplex (GDPS) to run under SA z/OS. Use this definition regardless of the specific GDPS product that is running (GDPS/PPRC, GDPS/PPRC HM, GDPS/XRC or GDPS/GM).

Additionally the following GDPS subtowers are available to distinguish between the GDPS product running on the system:

PPRC	For GDPS/PPRC
HM	For GDPS/PPRC HM
XRC	For GDPS/XRC
GM	For GDPS/GM

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

To enable SA z/OS, make sure that the following TOWER statements are activated in the NetView style sheet (that is, uncomment them):

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

Kanji Support: If you plan to use Kanji support make sure that you update the NetView style sheet as follows:

1. `transTbl =DSIKANJI` must be specified.
2. `transMember =CNMTRMSG` must be uncommented.

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

Automation Operator AUTO1 and AUTO2: AUTO1 and AUTO2 refer to the NetView autotasks AUTO1 and AUTO2 supplied as samples by NetView. They are used in the initialization of SA z/OS and they should not be used by NetView for NETCONV sessions or resource discovery. To prevent the AUTO2 sample automation operator being used by NetView, do the following in the style sheet:

1. For NETCONV sessions, blank out AUTO2 in the following statement:
   ```
   function.autotask.NetConv = AUTO2
   ```
   The statement should then be:
   ```
   function.autotask.NetConv = *NONE*
   ```
2. For resource discovery, choose an autotask *other* than AUTO2 in the following statement:
   ```
   function.autotask.autoip = AUTO2
   ```

Timer Catchup Processing: SA z/OS requires `init.TIMER=NO` for its timer catchup processing. If you do not have any timers defined in the SA z/OS policy or none of the defined timers has the `CATCHUP=YES` option, you can code `init.TIMER=YES` to cause your saved timers to be restored at NetView startup time.

Refer to the NetView documentation for details about customizing the NetView style sheet.

AOFMSGSY (optional)

If you have renamed any automation tasks in AOFOPFxx, you will need to make corresponding changes to the AOFMSGSY member.

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

1. If you want to define actions for messages that the SA z/OS NetView Automation Table does not trigger any actions for, you can use the symbol %AOFALWAYSACTION%.

   This synonym contains the action statement that is used for all messages in 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 in the same AT.

   See "Generic Synonyms: AOFMSGSY" in *IBM Tivoli System Automation for z/OS Customizing and Programming* for a description of these synonyms.

NetView Automation Tables

If you need to build NetView Automation Tables (ATs) in a way that is not supported by the customization dialog, you can use the INGMSGU1 fragment for user entries. INGMSGU1 is included before INGMSG02. You can also use the INGMSGU2 fragment for user entries. INGMSGU2 is included after 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
```

Message Revision Table

During the build of the automation control file, a NetView Revision Table is being built by the customization dialog. For more information about activating the built Message Revision Table (MRT) refer to chapter 'How to Add a Message to Automation' in *IBM Tivoli System Automation for z/OS Customizing and Programming*.

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.

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.

LIFECYCLE

This parameter allows you to prepare for Life Cycle Recording in order to debug automation manager-related problems. Normally, SA z/OS Service will advise when Life Cycle Recording should be enabled.

The value of *nnnn* defines the size of the data space in number of megabytes (1 through 2097). A value of 500 is recommended and is sufficient in most situations.

The value of *dataset* specifies the fully-qualified DSN to be used when offloading the dataspace to disk.

Note: *nnnn* and *dataset* must be separated by a semicolon without intervening blanks The total length of '*nnnn;dataset*' can be a maximum of 60 bytes.

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):

- 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 *IBM Tivoli 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.

You can specify a GRPID 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 @).

The GRPID is prefixed with the string INGXSG to construct the XCF group name that is used for cross system synchronization, for example, INGXSG*xy*.

If you do not specify a GRPID, the default group name INGXSG is 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*.

An example of a valid syntax is:

```
GRPID=XY,LIFECYCLE=500,LOGSTREAM=YES
```

An example of an invalid syntax is:

```
GRPID = 34 , LIFECYCLE = 500
```

INGCMD

If you want to use the SA z/OS SETTIMER command instead of the NetView SETTIMER command, use the following in the CNMCMDU member:

```
CMDDEF.EZLE600A.CMDSYN=TIMER,TIMERS,TIMR
CMDDEF.AOFRAATA.CMDSYN=SETTIMER
```

Step 6C: Modifying NetView DSIPARM Definitions for an Automation Network

SysOps	ProcOps	I/O Ops
✓	✓	

Note: The following information refers to setting up a single NetView automation network.

To support an automation network, you need to add or modify NetView definitions in the NetView DSIPARM data set member AOFOPFGW.

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 5 on page 34, the gateway autotask definitions in AOFOPFGW on domain CHI01 are:

```
GATCHI01 OPERATOR PASSWORD=GATCHI01
PROFILEN AOFPRFAO
GATCHI02 OPERATOR PASSWORD=GATCHI02
PROFILEN AOFPRFAO
GATCHI03 OPERATOR PASSWORD=GATCHI03
PROFILEN AOFPRFAO
```

Step 6D: 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 the NetView style sheet:

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

For SNMP, BCP internal interface connections, and HTTP connections, it is mandatory to make the security definitions described in “Controlling Access to the Processor Hardware Functions” on page 160.

Processor operations uses automation table entries for its operation. Make sure that 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 deactivated, 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.

Step 6E: 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 NetView style sheet 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 6F: Add the INGRXFPG REXX Function Package

SysOps	ProcOps	I/O Ops
✓	✓	

SA z/OS has its own REXX function package, INGRXFPG, that must be made declared to NetView. Add it to the function package table in the NetView DSIRXPRM module. Refer to the CNMSJM11 sample for the default NetView DSIRXPRM module that includes the function package table, and modify it.

The following example shows the package table containing the NetView REXX function package and the SA z/OS REXX function package:

```
*                                      PACKTB entry
PACKTB_SYSTEM_TOTAL DC F'2'            Total number of SYSTEM PACKTB
*                                       entries
PACKTB_SYSTEM_USED  DC F'2'            Number of used SYSTEM PACKTB
*                                       entries
...
          SPACE
PACKTB_USER_ENTRY  DS 0C               REXX USER Function Package Table
*                                        Entry
PACKTB_USER_NAME     DC CL8'DSIRXUFP'  Name of USER Function Package
PACKTB_LOCAL_ENTRY DS 0C               REXX LOCAL Function Package
*                                        Table Entry
PACKTB_LOCAL_NAME    DC CL8'DSIRXLFP'  Name of LOCAL Function Package
PACKTB_SYSTEM      DS 0C               REXX SYSTEM Function Package
*                                        Table Entry
                     DC CL8'INGRXFPG'  Name of SA z/OS Func Package
PACKTB_NAME          DC CL8'DSIRXFPG'  Name of SYSTEM Function Package
         SPACE 3
         END DSIRXPRM                  End of DSIRXPRM module
```

If you plan to use the CICSplex System Manager REXX API, EYU9AR00, edit the package table as shown in the following example containing the NetView REXX function package, the SA z/OS REXX function package, and the CICSplex System Manager REXX API:

```
*                                      PACKTB entry
PACKTB_SYSTEM_TOTAL DC F'3'            Total number of SYSTEM PACKTB
*                                       entries
PACKTB_SYSTEM_USED  DC F'3'            Number of used SYSTEM PACKTB
*                                       entries
...
          SPACE
PACKTB_USER_ENTRY  DS 0C               REXX USER Function Package Table
*                                        Entry
PACKTB_USER_NAME     DC CL8'DSIRXUFP'  Name of USER Function Package
PACKTB_LOCAL_ENTRY DS 0C               REXX LOCAL Function Package
*                                        Table Entry
PACKTB_LOCAL_NAME    DC CL8'DSIRXLFP'  Name of LOCAL Function Package
PACKTB_SYSTEM      DS 0C               REXX SYSTEM Function Package
*                                        Table Entry
                     DC CL8'EYU9AR00'  Name of SA z/OS CICS related
                     DC CL8'INGRXFPG'  Name of SA z/OS Func Package
PACKTB_NAME          DC CL8'DSIRXFPG'  Name of SYSTEM Function Package
         SPACE 3
         END DSIRXPRM                  End of DSIRXPRM module
```

Remember to update the total number of system packages and user function packages accordingly.

Step 7: 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 18.

In addition, refer to the publications *Hardware Management Console Guide* and *Support Element Operations Guide* for details about your HMC and SE.

The following customization information addresses different versions of the SE or HMC Console Workplace. You can identify the Console Workplace version of your HMC or SE in its main window title line. Choose the installation step that applies to your Console Workplace version.

Step 7A: Preparing the HMC (Console Workplace 2.8 and Earlier Versions)

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 its 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 its 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.” 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 when it is configured for connection protocol SNMP, using the Processor (CPC) entry in the SA z/OS Customization Dialog. See “Step 13: Install ISPF Dialog Panels” on page 92 and “Step 18: Defining Automation Policy” on page 103 for further details on maintaining the SA z/OS Policy Database.

Protocol	Select UDP from the drop-down list.
Name	PROCOPS (Use the community name that will be 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.

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).

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 7B: Preparing the HMC (Console Workplace 2.9 and Later Versions)

Enable the HMC API and Set SNMP Community Names

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 an HMC to control your CPCs over the TCP/IP SNMP ProcOps interface, omit this task. To complete this task:

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.
3. Click on the **Customize API Settings** icon. Make sure the **Enable SNMP APIs** check box is set in the Customize API Settings window.
4. **Important:** The window field SNMP agent parameters must be empty. Any data in this field will prevent the console application from establishing an API session successfully.

For SNMP connections to the HMC, the community names must be defined. After that, you can use native SNMP commands to query and set HMC object attributes, or you can use SA z/OS ProcOps to manage CPCs defined on the HMC and to execute CPC HW commands over the SA z/OS ProcOps SNMP interface.

A CPC is controlled over the SNMP interface when it is configured for connection protocol SNMP, using the Processor (CPC) entry in the SA z/OS Customization Dialog. See “Step 13: Install ISPF Dialog Panels” on page 92 and “Step 18: Defining Automation Policy” on page 103 for further details on maintaining the SA z/OS Policy Database.

5. The Customize API Settings window must be open. For a new ProcOps SNMP interface community name, select the Community Names table **Add** push button. In the Community Name data entry window enter the following information:

   Name
   Specify the name in uppercase. Record this name and use it when you go to define the processor entry for the CPC in your SA z/OS policy database with connection type SNMP.

   Address
   Use the IP address of your SA z/OS ProcOps 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 with the same community name. 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 defined.

   Access Type
   Select the **Read/write** radio button.
6. Select the **OK** push button to save the changed settings and close the data entry window.
7. If you have finished the SNMP API settings, select the **Apply** push button of the Customize API Settings window to save the changes.
8. The SNMP Configuration Info window is displayed to inform you that the HMC console must be restarted to activate your configuration changes.

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* or *ACSADMIN* authority. The HMC must have the CPC objects of your sysplex in its Defined CPCs Group.
2. Select **Console Actions** and click on the **Hardware Management Console Services** icon.
3. Select the **Customize Console Services** icon.
4. Make sure the **LIC Change** field in the Console Services window is set to **Enabled**.
5. Select the **OK** push button to save the change, or the **Cancel** push button if the **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 its Defined CPCs Group.

CPC Object Definitions on the HMC

Depending on the processor hardware interfaces, the CPCs that are to be managed must be defined to the HMC. For SA z/OS's BCP internal interface, the master HMC, which must have the 'LIC Change' service enabled, is used as a router between the CPC where SA z/OS is running, and other targeted CPCs.

For SA z/OS's ProcOps SNMP connection, the HMC serves as a single point of control. Alternatively, SA z/OS ProcOps can be configured to communicate directly with a CPC, by addressing its Support Element.

For detailed information about how to add, change, or remove CPC object definitions on a HMC, refer to the current *Hardware Management Console Operations Guide* (SC28-6821). Note that this manual is also available in the Books Work Area on the HMC.

Step 7C: Preparing the SE (Console Workplace 2.8 and Earlier Versions)

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 79
- “Set the Cross Partition Flags” on page 80 (LPAR mode)

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 when it is configured for connection protocol INTERNAL, using the Processor (CPC) entry of the SA z/OS Customization Dialog. See “Step 13: Install ISPF Dialog Panels” on page 92 and “Step 18: Defining Automation Policy” on page 103 for further details on maintaining the SA z/OS Policy Database.

   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 will define 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 when it is configured for connection protocol SNMP, using the Processor (CPC) entry of the SA z/OS Customization Dialog. See “Step 13: Install ISPF Dialog Panels” on page 92 and “Step 18: Defining Automation Policy” on page 103 for further details on maintaining the SA z/OS Policy Database.

   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 that you intend to specify 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.

Step 7D: Preparing the SE (Console Workplace 2.9 and Later Versions)

Enable the SE API and Set the Community Name

To control a CPC with the SA z/OS hardware interfaces BCPii or SNMP ProcOps directly, the CPC Support Element API function must be enabled. To complete this task:

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 **Support Element Settings** icon.
3. Click on the **Customize API Settings** icon. Make sure the **Enable SNMP APIs** check box is set in the Customize API Settings window.
4. **Important:** The window field SNMP agent parameters must be empty. Any data in this field will prevent the console application from establishing an API session successfully.

Set the Community Name for SNMP and ProcOps Connections.

For SNMP connections to the SE, the community names must be defined. After that, you can use native SNMP commands to query and set SE object attributes, or you can use SA z/OS ProcOps to manage the CPC and to execute CPC HW commands using the SA z/OS ProcOps SNMP interface.

A CPC is controlled over the SNMP interface when it is configured with connection protocol SNMP in the Processor (CPC) entry of the SA z/OS Customization Dialog. See “Step 13: Install ISPF Dialog Panels” on page 92 and “Step 18: Defining Automation Policy” on page 103 for further details on maintaining the SA z/OS Policy Database.

5.
   a. The Customize API Settings window must be open. For a new ProcOps SNMP interface community name, select the Community Names table **Add** push button. In the Community Name data entry window enter the following information:

      Name Specify the name in uppercase. Record this name and use it when you are going to specify the processor entry for the CPC in your SA z/OS policy database with connection type SNMP.

Address
Use the IP address of your SA z/OS ProcOps 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 with the same community name. Specify 0.0.0.0 as the address and network mask if you want to allow access from any location in your network to the SE, using the community name defined.

Access Type
Select the **Read/write** radio button.

Set the Community Name for a BCP Internal Interface Connection

For BCPii connections to the SE, a community name must be defined.

A CPC is controlled over the BCPii when it is configured with a connection protocol INTERNAL, using the Processor (CPC) entry of the SA z/OS Customization Dialog. See “Step 13: Install ISPF Dialog Panels” on page 92 and “Step 18: Defining Automation Policy” on page 103 for further details on maintaining the SA z/OS Policy Database.

b. The Customize API Settings window must be open. For a new BCP internal interface community name, select the Community Names table **Add** push button. In the Community Name data entry window enter the following information:

Name
Use the community name you will specify in the processor entry for the CPC in your SA z/OS policy database for ProcOps that has the connection type INTERNAL.

Address
The required address is 127.0.0.1

Network Mask
The required value is 255.255.255.255

Access Type
Select the **Read/write** radio button.

6. Select the **OK** push button to save the changed settings and close the data entry window.
7. If you have finished the API settings, select the **Apply** push button of the Customize API Settings window to save the changes.
8. The SNMP Configuration Info window is displayed to inform you that the SE console must be restarted to activate your configuration changes.

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.

Step 7E Preparing the SE (Console Workplace 2.10 and Later Versions)

Enabling Capacity Change API Requests

To be able to perform capacity changes (for example, CBU) using the SA z/OS hardware interfaces BCPii or SNMP ProcOps, the 'Allow Capacity Change API requests' flag must be set:

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 Support Element Settings icon.
3. Click on the Customize API Settings icon. Make sure the 'Allow Capacity Change API Requests' check box is set in the Customize API Settings window.

Step 7F: 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 8: Preparing Ensemble HMC Communication

SysOps	ProcOps	I/O Ops
	*	

The steps described in this section are necessary to prepare your environment to communicate with the ensemble Hardware Management Console (HMC). For details about planning the hardware interface, refer to “Planning the Hardware Interfaces” on page 18. If you do not plan to manage your zEnterprise zBX Blade Centers using ProcOps interface, omit this step.

In addition, refer to the publications: *System z Hardware Management Console Operations Guide Version 2.11.1 (SC28-6905-01)* or later as well as to the *zEnterprise System Hardware Management Console Operations Guide for Ensembles Version 2.11.1 (SC27-2615-01)* or later.

Step 8A: Setting up the Ensemble Hardware Management Console for use with System Automation for z/OS

Refer to Appendix H, “Ensemble Hardware Management Console Setup,” on page 225 for further details.

Step 8B: Setting up AT-TLS for the SSL socket connection

In order to communicate to the Web Services API of the zEnterprise System Hardware Management Console (HMC), the following setup actions are required on the z/OS system where the ProcOps focal point can run.

1. Policy agent (PAGENT) setup.

Please refer to the *z/OS Communication Server* documentation for details. Be aware that the TCP/IP profile selected for the ensemble zBX management has to contain the statement "TCPCONFIG TTLS" to result in the activation of the processed policy definitions and the statement “AUTOLOG PAGENT ENDAUTOLOG” to result in the automatic start of the PAGENT.

2. AT-TLS Policy

Modify PAGENT environment variables to run with the AT-TLS configuration required for the SSL communication. For information on the environment variables, refer to the *IP Configuration Guide*.

Figure 8 on page 84 is a sample AT-TLS policy with the TCPIP trace level 4. Please specify <tlsKeyring> and <ip_addr> accordingly. The minimal required cipher suite is the TLS_RSA_WITH_RC4_128_MD5.

```
TTLSRule                           NV_ENS_HMC1
 {
   LocalAddr                       ALL
   RemoteAddrRef                   addr_ENS_HMC
   LocalPortRange                  0
   RemotePortGroupRef              port_ENS_HMC
   Direction                       Outbound
   Priority                        255
   TTLSGroupActionRef              HMC1GRP
   TTLSEnvironmentActionRef        HMC1ENV
   TTLSConnectionActionRef         HMC1CON
  }
  Portgroup                        port_HMC
  {
   Portrange
   {
     Port  6794
   }
   Portrange
   {
     Port  61612
   }
  }
TTLSGroupAction                    HMC1GRP
 {
   TTLSEnabled                     On
 }
TTLSEnvironmentAction              HMC1ENV
 {
   HandshakeRole                   Client
   EnvironmentUserInstance         0
   TTLSKeyringParmsRef             keyR1
   TTLSEnvironmentAdvancedParmsRef HMC1ADV
   Trace                           4
 }
TTLSConnectionAction               HMC1CON
 {
   HandshakeRole                   Client
   Trace                           4
   TTLSCipherParmsRef              Cipher_for_HMC
 }
 TTLSCipherParms                   Cipher_for_HMC
 {
    V3CipherSuites                 TLS_RSA_WITH_RC4_128_MD5
 }
 TTLSEnvironmentAdvancedParms      HMC1ADV
 {
   ApplicationControlled           Off
   ClientAuthType                  PassThru
 }
 TTLSKeyringParms                  keyR1
 {
   Keyring                         <tlsKeyring>
 }
 IpAddr                            addr_ENS_HMC
 {
   Addr                            <ip_addr>
 }
```

Figure 8. Sample AT-TLS policy

3. Certificate registration in keyring

Upload the HMC certificate file (prepared in “Step 8A: Setting up the Ensemble Hardware Management Console for use with System Automation for z/OS” on page 82) to z/OS with ASCII to EBCDIC translation and add it to the NetView userid’s keyring.

For RACF users, the following commands would complete the job:

```
racdcert id(stcuser) addring(<tlsKeyring>)
racdcert id(stcuser) add ('<UID.HMC.CERT') WITHLABEL ('<label>') TRUST
racdcert id(stcuser) connect (ID(stcuser) RING(<<tlsKeyring>>) LABEL(' <label>') USAGE(CERTAUTH)
setropts raclist (digtring) refresh
setropts raclist (digtcert) refresh
```

If you start NetView as a regular job, the keyring should be added to the user ID submitting the job.

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 87.

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 in 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 for IPv4 connections, or in the preferred conventional form for IPv6 connections. If a node name is specified and that node name has several addresses, all addresses that are returned are used.

Note node names cannot be used to validate IPv6 connections and are ignored if the PSM is running an IPv6 environment.

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
* Normal focal point Netview IPv6
    FD00:9:152:40:840:FFFF:80:253
/* the backup IPv6
FD00:9:152:40:840:FFFF:80:254
```

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.

PSMIPV4
You should set this keyword to Y to indicate that PSM should enforce IPv4 sockets in an IPv6-enabled environment. Supported values are Y or N. If PSMIPV4 is not specified, default value N is used by the PSM and IPv6 will be preferred.

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: XCF Characteristics

SA z/OS uses XCF characteristics with any communication method. Ensure that transport classes for CLASSLEN(956) and CLASSLEN(4028) are defined. An XCF group name should not be assigned to the transport classes.

When setting up the sysplex you need to be aware that SA z/OS has a maximum XCF message length of 3500 bytes. You can either use an existing transport class with the appropriate class length, or define a new transport class.

Step 10B: 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 in the automation subplex.

Alternatively you can put the automation manager PARMLIB member in any partitioned data set. Then, you need to specify the HSAPLIB DD statement in the automation manager startup procedure member.

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 55. Refer to Appendix I, "Syntax for HSAPRM00," on page 229 for the contents of this sample and the description of the parameters.

Step 10C: ARM Instrumentation of the Automation Manager

The automation manager can be enabled for Automatic Restart Manager (ARM). However, this is optional and not recommended if you use the *BASE best practice policy.

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 automation managers that survived 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 or the restarted instance will take over.

SA z/OS provides a policy sample with the following major options:

- Restart only for an address space ABEND (Option ELEMTERM). 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 10D: Security Considerations

The started task that invokes the automation manager (see INGEAMSA in the sample library) must have the following access rights:

1. If the automation manager is to be started with option BLOCKOMVS=YES the started task must be defined by RACF as a superuser for UNIX System Services. For more information about BLOCKOMVS refer to Appendix I, "Syntax for HSAPRM00," on page 229.
2. If you are not a superuser, you must have access to the OMVS segment.
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
   - The schedule override file
   - The configuration information file (DDname HSACFGIN)
   - The takeover file

Step 11: Customizing the Component Trace

SysOps	ProcOps	I/O Ops
✓		✓

Both the system operations component and 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 to SYS1.PARMLIB. Do not change this member.
- Copy the CTIIHVZZ member from the SINGSAMP sample library to SYS1.PARMLIB. You may change this member to meet your requirements. Refer to "Appendix C. Problem Determination" in *IBM Tivoli System Automation for z/OS User's Guide* for more information.

- 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
*		

Although 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.

Notes:

1. The LOGSTREAM parameter in the HSAPRM*xx* parmlib member is set to YES by default. The automation manager connects to the logger address space at initialization time.
2. If you set the LOGSTREAM parameter to NO, no access will be established to the system logger. Step 11 is then unnecessary.

To exploit the system logger, the following must be fulfilled:

- Systems in a sysplex must run in XCF mode and the following must be defined in SYS1.PARMLIB(IEASYS*xx*):
  ```
  PLEXCFG=MULTISYSTEM
  ```
- For standalone systems the following must be defined in SYS1.PARMLIB(IEASYS*xx*):
  ```
  PLEXCFG=MONOPLEX
  ```

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.

Use the following sample JCLs to define the log stream in different environments:

- For a single system environment, use the sample JCL provided in member HSAJDLGM (for the automation manager)
- For 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 HSAJD*xxx* members as input and make the changes accordingly.

Note: Do not change the provided `MAXBUFSIZE` values in the HSAJDxxx job. The provided values match the size of the expected data.

For a sysplex environment, you must additionally add the log structures to the CFRM policy:

```
STRUCTURE   NAME(HSA_LOG)
            SIZE(9216)
            FULLTHRESHOLD(0)
            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). Since System Logger manages the space of the structure there is no need for additional monitoring. The parameter FULLTHRESHOLD(0) disables XES monitoring and potential IXC588E messages.

If you are running on z/OS 1.9 or above you will need to increase the size of for the CFRM policy to a minimum of 9216K. The minimum size for z/OS 1.9 CF level 16 is 9216K. You will also need to modify the sample HSAJDLGS to increase the size as well. You may see message IXL015I STRUCTURE ALLOCATION INFORMATION indicating the size specified was not large enough.

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 about 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 address spaces of the NetView agents and automation manager need to be authorized to access the log streams. They need update access for the following:

```
RESOURCE(logstream_name)
CLASS(LOGSTRM)
```

Where *logstream_name* stands for HSA.MESSAGE.LOG and 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
✓	✓	✓

SA z/OS ships two types of ISPF dialogs:

- For defining automation policy: The customization dialog is used to create system operations and processor operations configuration and automation definitions.
- For I/O operations: The I/O operations command panels are used for I/O operations functions.

Both of these ISPF dialogs are 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 J, “INGDLG Command,” on page 235 for more details.

Because 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. Because they do not support multisystem commands for I/O operations functions, you must install them on each system, focal point or target, where you want to use them.

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

The recommended way to start the customization dialog is Alternative 1. SA z/OS provides a sample INGEDLG in the SINGSAMP library for this.

Remember:

Throughout this step use the names of the data sets that you created in “Step 3: Allocate Data Sets for the ISPF Dialog” on page 58.

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 Appendix J, “INGDLG Command,” on page 235 for the use of INGDLG to allocate libraries.

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 applications, 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 temporarily hold file tailoring output and to hold the JCL for batch jobs. 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. The table output data set must also be in the sequence of data sets allocated to ISPTLIB. Furthermore it is recommended that the first data set allocated to ISPTLIB is user-specific. This is guaranteed if INGDLG is called with the default of ALLOCATE(YES). Then the user's ISPPROF data set is automatically defined as the first data set, and the table output data set is allocated as well. If the first data set allocated to ISPTLIB is not-user specific, multiple users may experience enqueue problems if working with the same PDB concurrently. The reason is that 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. The AOFTABL DD statement (**1**) is required to store ISPF tables created when you use the customization dialog. Such tables are used, for example, during pdb import or when the administrator modifies the SA z/OS policy definitions from the SA z/OS customization dialog. 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 ISPF Dialog" on page 58).
6. 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.
7. The AOFIPDB DD statement (**3**) points to the SA z/OS sample library.

   The AOFIPDB DD statement is required for using best practice policies and for building system operations configuration files.
8. IHVCONF (**4**), is required for I/O operations. If you are not using I/O operations this DD statement is optional.
9. 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.
10. 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 want 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: Logging Modifications to Data Set

During APAR apply, a log of the modifications is created and it is written to that data set. If the data set does not exist a dynamic allocation is attempted using a default name. If this name does not fit the installation's naming conventions, or a data set allocation is not allowed at all, this data set should be pre-allocated. Besides the APAR apply, this data set is needed by the report functions which are invoked by the "Report Selection Menu".

Hint:
The Report Output Data Set is required for APAR apply.

Step 13C: Invoking the ISPF Dialogs

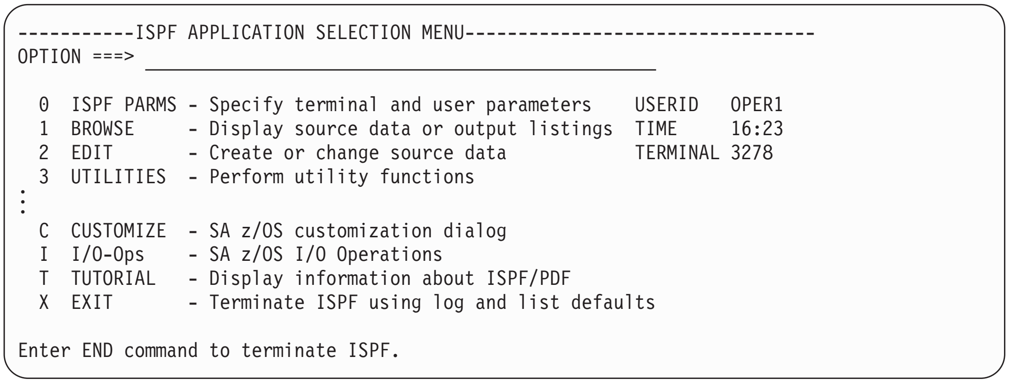
SysOps	ProcOps	I/O Ops
✓	✓	✓

The ISPF dialogs are invoked with the INGDLG command. Parameters of this command determine which set of dialogs is invoked (that is, system operations, processor operations, or I/O operations).

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 9 is an example of what a modified panel might look like.



```
-----------ISPF APPLICATION SELECTION MENU---------------------------------
OPTION ===> ________________________________________________

  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 9. ISPF Application Selection Menu

The options for the customization dialog and the I/O operations command 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.

There are two alternatives to invoke the ISPF dialog:

- "Using INGDLG." This is the recommended method.
- "Using TSO Logon or Your own Automation Procedure."

Using INGDLG

If you let INGDLG, described in Appendix J, "INGDLG Command," on page 235, 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)            ')"
```

A sample member called INGEDLG is provided in SINGSAMP sample library for invocation of INGDLG with data set allocation done by INGDLG.

Using TSO Logon or Your own Automation Procedure

This is the example to be followed if you allocated the data sets using the TSO logon procedure or an automation procedure 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
```

Step 13D: 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 13E: 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. On the Customization Dialog Primary Menu that will appear, verify the release in the panel header

If you run the REXX exec IOCONNECT shown on page 97, the I/O Operations ISPF Main Menu is displayed. You can use the information shown to verify your SA z/OS installation.

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 20.

Step 15: Install Function Packages for NetView and TSO

SysOps	ProcOps	I/O Ops
*		

This step is required if you would like to use the general purpose command receiver and if you would like to use the syntax checking for automation table overrides. The command receiver is used to pass NetView, SA z/OS or MVS commands to SA z/OS for execution. For more information, refer to the chapter "Command Receivers" in *IBM Tivoli System Automation for z/OS Customizing and Programming*. For more information about the syntax checking for the automation table overrides refer to the Message Automation Definition in the chapter "Application Entry Type" of *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

This step is also required if you are using Automated Discovery, and specifically its Preloader function.

INGTXFPG must be made known to TSO

Add INGTXFPG to the function package table in the appropriate TSO module below. TSO/E provides the following samples in SYS1.SAMPLIB that you can use to code your load modules:

Table 16. TSO Load Modules for INGTXFPG

Sample name	Load module name
IRXREXX1	(IRXPARMS for MVS)
IRXREXX2	(IRXTSPRM for TSO/E)
IRXREXX3	(IRXISPRM)

There are various considerations for providing your own parameters modules. For further details, see Chapter 14 - Function Package of the *TSO REXX Reference*. The different considerations are based on whether you want to change a parameter value for an environment(s) initialized:

- for ISPF
- for both TSO/E and ISPF sessions
- in a non-TSO/E address space

Select the appropriate sample parameters modules, for example **IRXREXX2 for TSO/E and batch PGM=IKJEFT01** and make the highlighted and underlined changes similar to the example both:

```
PACKTB_SYSTEM_FIRST DC A(PACKTB_ENTRIES)        /* Address of the first*/
*                                               /* System Entry       */
PACKTB_SYSTEM_TOTAL DC F'3'                     /* Total number of    */
*                                               /* system entries     */
PACKTB_SYSTEM_USED DC F'3'                      /* Number of System   */
*                                               /* entries in use     */
PACKTB_LENGTH DC F'8'                   /* Length of each PACKTB entry */
PACKTB_FFFF DC X'FFFFFFFFFFFFFFFF       /* Set the PACKTB end marker   */
PACKTB_ENTRIES EQU *                    /* System Package Table entries */
PACKTB_ENTRY_MVS EQU *                   /* The MVS-PACKTB             */
PACKTB_NAME_MVS DC CL8 'IRXEFMVS'       /* 1. Set function package name */
PACKTB_NAME_MVS DS 0C                   /* Point to the next entry    */
PACKTB_ENTRY_TSO EQU *                   /* The TSO PACKTB entry       */
PACKTB_NAME_TSO DC CL8 'IRXEFPCK'       /* 2. Set function package name */
PACKTB_NEXT_TSO DS 0C                   /* Point to the next entry     */
PACKTB_ENTRY_SAM EQU *                  /* The SAM PACKTB entry        */
PACKTB_NAME_SAM DC CL8 'INGTXFPG'       /* 3. Set SA function package  */
PACKTB_NEXT_SAM DS 0C                   /* Point to next entry         */
```

1. Link-edit the REXX default parameters module with the corresponding names. For example, the load module for the sample IRXREXX2 must have the name IRXTSPRM
2. Place the resultant REXX default parameter module in the LPALST
3. Make sure that the function package INGTXFPG resides in the LinkList

Step 16: Customization of Alert Notification for SA z/OS

SysOps	ProcOps	I/O Ops
*		

This section describes the customization steps that are required for alert notification by SA z/OS.

In order to use alert notification the following must apply to the affected resource in your automation policy:

1. The inform list of the resource must contain at least one of the following communication methods (it can also be defaulted or inherited):
   - IOM: via the IBM Tivoli System Automation for Integrated Operations Management (SA IOM) peer-to-peer protocol
   - EIF: via a Tivoli Event Integration Facility (EIF) event
   - TTT: via XML
   - USR: via a user-defined alert handler
2. Codes must be present on the reserved message ID, INGALERT, that are suitable for the chosen communication methods.

For full details about the installation of related workstation components, refer to Chapter 8, “Installing SA z/OS Workstation Components,” on page 139. Additionally for further information, see *IBM Tivoli System Automation for z/OS Defining Automation Policy* and *IBM Tivoli System Automation for z/OS Customizing and Programming*.

Furthermore, for each system that is able to trigger an alert (that is, to issue an INGALERT command), the ALERTMODE parameter must be set to the chosen communication methods with the INGCNTL command, for example:

```
INGCNTL SET ALERTMODE='IOM EIF TTT USR'
```

You can also use the following command to set alerting for all available communication methods:

```
INGCNTL SET ALERTMODE=ON
```

The available communication methods are:

- IOM: via the SA IOM peer-to-peer protocol
- EIF: via EIF events
- TTT: via XML
- USR: via a user-defined alert handler

For more details about INGCNTL, see *IBM Tivoli System Automation for z/OS Programmer's Reference*.

Depending on the chosen communication methods, additional customization is required. This is described in the following sections. Note that you can combine the INGCNTL calls shown in this section in one single invocation.

Enabling Alert Notification via SA IOM Peer-To-Peer Protocol

On each system that can connect to an SA IOM server you must set the host name and port number with INGCNTL, for example:

```
INGCNTL SET ALERTHOST=IOMSRV1:1040
```

For more details about INGCNTL, see *IBM Tivoli System Automation for z/OS Programmer's Reference*.

Enabling Alert Notification via EIF Events

Alert notification uses the message adapter service of the event/automation service (EAS) component of NetView to create EIF events and to integrate SA z/OS and products such as:

- IBM Tivoli Enterprise Console (TEC)

- IBM Tivoli Netcool® OMNIbus (OMNIbus)

On each system that is able to send EIF events you must set the PPI receiver name of the EAS with INGCNTL, for example:

```
INGCNTL SET EIFPPI=INGEVOMN
```

For more details about INGCNTL, see *IBM Tivoli System Automation for z/OS Programmer's Reference*.

Starting the Event/Automation Service

The EAS and the steps to enable it are described in the chapter, "Setting Up UNIX System Services for the NetView Program" in *IBM Tivoli NetView for z/OS Installation: Configuring Additional Components*. The following section only provides additional information about how to enable the NetView message adapter service of EAS for alert notification.

The EAS can be started either with a job from an MVS system console, or from a UNIX System Service command shell. In either case, startup parameters must be provided in the form of the following initialization files:

1. Global initialization file (Default: IHSAINIT)
2. Message adapter configuration file (Default: IHSAMCFG)

A sample for starting EAS as a job is located in NETVIEW.CNMSAMP as the member IHSAEVNT. The initialization files are assumed to be located in a data set that is allocated to the DD name IHSSMP3. Perform the following updates to the sample to meet the requirements of your installation:

1. If you do not use the default name IHSAINIT for the global initialization file, pass the name of your file via the parameter INITFILE.
2. If you do not use the default name IHSAMCFG for the message adapter configuration file, pass the name of your file via the parameter MSGCFG.
3. In the DD statement, specify the data set names of your installation.

Configuring the Global Initialization File

To configure the global initialization file:

1. Make sure that the NetView message adapter service is also started when you start the EAS. This is done by commenting out the following statement:

   ```
   NOSTART TASK=MESSAGEA
   ```

   The other services are not needed by alert notification, so prevent them from starting.
2. Specify INGEVOMN, or any other name of the PPI receiver ID, in the following statement:

   ```
   PPI=INGEVOMN
   ```

   You can also pass the PPI receiver ID as a parameter when starting EAS. Make sure that you define the same name that you specified with INGCNTL.

Configuring the NetView Message Adapter Service

Configuration of the NetView message adapter service is done in the message adapter configuration file, as follows:

1. Provide the IP address or host name and, optionally, the port address of the event receiver. This can be virtually any kind of server that can handle EIF events but SA z/OS supplies integration with:
   - IBM Tivoli Enterprise Console (TEC)

- IBM Tivoli Netcool OMNIbus (OMNIbus)

2. Specify the name of the NetView message adapter format file. The version of this file that is to be used by alert notification is delivered in ING.SINGSAMP(INGMFMTO). If this is in its own data set, copy it to a data set that is concatenated to IHSSMP3.

Enabling Alert Notification via XML

Alert notification can help with creating trouble tickets automatically. Thus SA z/OS collects details about the failed resource and stores it in a details data set. It also creates XML data with overview information.

You must use the INGCNTL command to set the host name and port number to send the XML data to on each system that is able to create trouble ticket information, for example:

```
INGCNTL SET TTTHOST=TDISRV1:8000
```

You must also specify allocation data for the details data set, for example:

```
INGCNTL SET TTTDATA='ING.TTT.DATA 1 1'
```

For more details about INGCNTL, see *IBM Tivoli System Automation for z/OS Programmer's Reference*.

Enabling Alert Notification via User-Defined Alert Handler

SA z/OS allows you handle an alert in any other way that you choose.

On each system that is able to run a user-defined alert handler you must specify the command to be executed with INGCNTL, for example:

```
INGCNTL SET USRHANDLER=MYHANDLER
```

For more details about INGCNTL, see *IBM Tivoli System Automation for z/OS Programmer's Reference*.

For details about the parameters that are passed and the return codes, see the sample handler delivered in ING.SINGSAMP(AOFEXALT).

Step 17: 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.

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.

Notes®

1. A compiler return code of 4 can be expected and is acceptable.
2. SA z/OS has *not* been tested to run with the REXX Alternate Library. Officially, this is not a supported environment.
3. The NOTESTHALT compiler option should not be used when compiling System Automation REXX.

Step 18: 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.

If you start from scratch:

1. Use the IBM best practice policies that are delivered with SA z/OS, *BASE and any others as required, and create your new policy database. Read the information in the section “Creating a New Policy Database” in *IBM Tivoli System Automation for z/OS Defining Automation Policy*. There is also an application automated discovery function that generates a simple automation policy based on a snapshot of all applications that were active at the time of the discovery. Using that tool in combination with the best practice policies may help you to get your policy customized faster. Refer to the chapter "Automated System Resource Discovery" in *IBM Tivoli System Automation for z/OS Customizing and Programming*.
2. Next adjust and extend your automation policy. Start by working with the following policy objects:
   - Applications
   - Application groups
   - Monitor Resources
   - Processors
   - Systems
   - A group for each sysplex

You can find detailed information about 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.

If you already have a policy database, make a copy or backup, then complete the following steps.

Step 18A: Build the Control Files

This step is required only for systems that are running SA z/OS 3.2, or earlier.

IBM recommends that you use the SA z/OS best practice sample policies to define your SA z/OS components. When you have defined the policies for the SA z/OS components, use the BUILD command to create the configuration files. The BUILD command is available from various panels of the customization dialog. For more information about how to perform this step, refer to *IBM Tivoli System Automation for z/OS Defining Automation Policy*. You can use the sample job INGEBBLD in the SINGSAMP sample library to create the configuration files in batch.

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 configuration files manually.

A manually edited automation control file may damage your automation.

Step 18B: Distribute System Operations Configuration Files

You need to make the configuration files available to the automation agents and automation managers on the target systems. All automation managers and automation agents in 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 managers it can either be placed in the automation managers' current configuration data set or the automation managers can be told to use a new configuration data set.

Step 19: 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 19A: 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 operators that you defined in the DSIOPF member of the NetView DSIPARM data set.
2. SA z/OS uses the NetView BGNSESS command with the parameter SRCLU=* to create terminal access facility (TAF) fullscreen sessions for communication with OMEGAMON monitors, if requested.

   Note: It is expected that OMEGAMON classic is installed and has been configured for VTAM.

   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 thus to be available to NetView.

   If, however, you have another NetView defined as a primary program operator application program (PPO), it receives unsolicited messages first and messages do not reach the NetView that is defined as a secondary program operator application program (SPO). See *Tivoli NetView for z/OS Installation and Administration* for information on PPO and SPO definitions.

Step 19B: 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 or I/O operations, these definitions remain the same.

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 unless you use APPN. I/O operations uses the LU 0 protocol for the communication between hosts.

Because 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), 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 is shown in Figure 10.

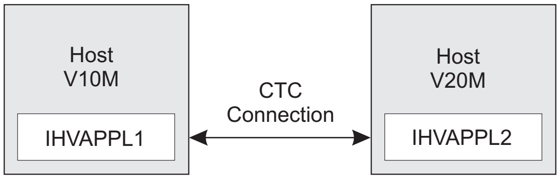


Figure 10. VTAM Definition Statements

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.

Cross-domain definitions

```
V10M

VTAMA    VBUILD TYPE=CDRM
V10M     CDRM   SUBAREA=10
V20M     CDRM   SUBAREA=20
```

```
V20M

VTAMB    VBUILD TYPE=CDRM
V10M     CDRM   SUBAREA=10
V20M     CDRM   SUBAREA=20
```

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 user-specified names must be unique in the network. These are the names that the other I/O operations hosts will know each I/O operations by.

The ACBNAME parameter is required for I/O operations. This name must be IHVISC, and 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 DLOGMOD and MODETAB parameters given in the example below, or equivalent definitions, should be used. Note that an 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,
               DLOGMOD=INTERACT,   |                 DLOGMOD=INTERACT,
               SONSCIP=YES,        |                 SONSCIP=YES,
               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, as follows:

```
         VBUILD TYPE=CDRSC         |            VBUILD TYPE=CDRSC
IHVAPPL2 CDRSC CDRM=V20M           |   IHVAPPL1 CDRSC CDRM=V10M
```

The communication paths between the I/O operations hosts must be defined, as follows:

```
         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 (COS) definition is:

```
ISTSDCOS COSTAB                    |   ISTSDCOS COSTAB
         :                         |            :
IHVAPPL1 COS VR=((0,2),(1,2))      |   IHVAPPL2 COS VR=((0,2),(1,2))
         :                         |            :
         COSEND                    |            COSEND
```

APPN Definitions

Assuming that both hosts reside in the same domain, XYZ, the equivalent APPN definitions are:

```
 VTAM A                            | VTAM B
                                   |
___________________________________|___________________________________
                   APPN Transport Resource List
_______________________________________________________________________
         VBUILD TYPE=LOCAL         |          VBUILD TYPE=LOCAL
XYZANTRL PU TRLE=XYZATRLN,         | XYZBNTRL PU TRLE=XYZBTRLN,
            CONNTYPE=APPN,         |             CONNTYPE=APPN,
            CPCP=YES               |             CPCP=YES
___________________________________|___________________________________
                   Channel to Channel Adapter
_______________________________________________________________________
         VBUILD TYPE=TRL           |          VBUILD TYPE=TRL
XYZATRLN TRLE LNCTL=MPC,           | XYZBTRLN TRLE LNCTL=MPC,
               READ=(cua),         |               READ=(cua),
              WRITE=(cua),         |               WRITE=(cua),
              MPCLEVEL=NOHPDT      |               MPCLEVEL=NOHPDT
```

```
_____________________________________|_____________________________________
                    I/O operations / VTAM
___________________________________________________________________________
         VBUILD TYPE=APPL            |          VBUILD TYPE=APPL
IHVAPPL1 APPL ACBNAME=IHVISC,        | IHVAPPL2 APPL ACBNAME=IHVISC,
              AUTH=ACQ,              |               AUTH=ACQ,
              DLOGMOD=INTERACT,      |               DLOGMOD=INTERACT,
              SONSCIP=YES,           |               SONSCIP=YES,
              MODETAB=ISTINCLM       |               MODETAB=ISTINCLM
```

For details of the channel unit address (CUA) refer to the section “Operand descriptions” in the chapter “Transport resource list major node” in *z/OS Communications Server: SNA Resource Definition Reference*.

The APPL-specific definitions are identical to those described in “Cross-domain definitions” on page 106.

Step 19C: Perform TCP/IP Definitions

SysOps	ProcOps	I/O Ops
		✓

Note: This applies to I/O operations host-to-host communications only.

In order to use TCP/IP for I/O operations, there are some definitions that I/O operations requires. These definitions are in addition to those needed for the installation and running of VTAM.

Starting with SA z/OS 3.2, I/O operations prefers to communicate with other hosts using the TCP protocol when the remote host is running a release level that is the same or higher. I/O operations requires a TCP/IP host name or an alias name that is no more than 8 characters long. This is because this name must be stored in the switch host data buffer, which has a limited size. If you have defined longer host names you must define an alias of up to 8 characters for each host name that exceeds the limit. You can define alias host names in the local host tables which can be either HOSTS.LOCAL or IPNODES. I/O operations uses z/OS Communications Server resolver API services to obtain the host name.

1. Refer to the section “Search orders used in the native MVS environment” in the *z/OS Communications Server IP Configuration Guide* for information about how the host name value is determined and how the base resolver configuration files, local host tables, and services information are used.
2. For configuring locally defined host names, refer to the section “Configuring the local host table (optional)” in the *z/OS Communications Server IP Configuration Guide*
3. If you are using locally defined host names, check the TCPIP.DATA LOOKUP statement of each system that you have defined an alias for. Verify that either LOCAL is specified or LOCAL precedes DNS, because the DNS server does not return an alias name. Refer to the section “LOOKUP” in the chapter “TCPIP.DATA configuration statements” of *z/OS Communications Server: IP Configuration Reference* for more information.

Because each I/O operations program acts as a server as well as a client, it requires port definitions in the '/etc/services' respectively 'ETC.SERVICES' service information data set:

```
IHVsrvr  portnumber/tcp
IHVclnt  portnumber/tcp
```

The first entry is mandatory for reestablishing a connection after an interrupt. The second entry is optional. You have to specify the second entry if you want to restrict particular ports for the use by I/O operations. For details of controlling access to ports refer to the section “Port access control” in the chapter “Security” of *z/OS Communications Server: IP Configuration Guide*.

Note that the service names require the component code (IHV) to be defined in uppercase and the remaining characters in lowercase. For details on how the service names are obtained by TCPIP, see the Services information in the section "Search orders used in the native MVS environment" in *z/OS Communications Server: IP Configuration Guide*. For information on defining service names, see the section "/etc/services and ETC.SERVICES port assignments" in *z/OS Communications Server: IP Configuration Reference*.

Note: If you omit the definition of the server port, I/O operations suppresses the TCP/IP communication for its lifetime and falls back to VTAM communication.

Check the MAXSOCKETS parameter in the BPXPRM*xx* parmlib member's NETWORK statement that corresponds to the addressing family. This value determines how many sockets for a particular addressing family can be opened in the entire system. I/O operations requires twice the number of possible TCP connections plus one.

The number of sockets that an application can open is also limited by the UNIX System Services parameter MAXFILEPROC in the BPXPRM*xx* parmlib member. This parameter determines the number of sockets each address space can have open. The same rules apply to this parameter, that is, I/O operations requires twice the number of possible TCP connections plus one.

Check the SOMAXCONN value that defines the maximum number of connection requests queued for the listening socket. I/O operations cannot have more than 256 connection (VTAM and TCP/IP) at a time. However it is very unlikely that all connection requests occur at the same time because it is dependent on the time that each I/O operations is started. The default value of 10 is probably large enough.

Step 20: 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 want 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 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 SA z/OS and Automatic Restart Manager, see *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Step 21: 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 documentation.

You should perform this step if you want to ensure that only authorized staff can manage the resources in your environment.

Your operations staff and automation facilities at SA z/OS-controlled 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 by NetView or an SAF-based security product, such as RACF.

Additionally SA z/OS provides the following samples in the SA z/OS SINGSAMP sample library to help you to establish security on your systems:

1. INGESAF sample JCL with definitions for a RACF environment
2. INGESCAT sample command authorization table for security checking within NetView

See also the following sections in Appendix A, “Security and Authorization,” on page 153 for other security options:

- “Granting NetView and the STC-User Access to Data Sets” on page 153
- “Restricting Access to INGPLEX and INGCF Functions” on page 156
- “Restricting Access to Joblog Monitoring Task INGJLM” on page 157
- “Security for IBM Tivoli Monitoring Products” on page 157 (OMEGAMON)
- “Controlling Access to the Processor Hardware Functions” on page 160
- “Defining a RACF Profile for I/O Operations” on page 164
- “Establishing Authorization with Network Security Program” on page 169

For SNMP, BCP internal interface, TCP/IP and HTTP connections, it is mandatory to make the security definitions described in “Controlling Access to the Processor Hardware Functions” on page 160.

For UNIX System Services automation, one or more UNIX segments (OMVS) must be defined. For details, refer to “Step 33A: Define UNIX Segments (OMVS)” on page 131.

Step 22: Customize the Status Display Facility (SDF)

SysOps	ProcOps	I/O Ops
*	*	

If you decide to use SDF as the SA z/OS fullscreen operator interface for monitoring automated resource statuses at the NetView 3270 console, customizing SDF involves defining the following:

- SDF initialization parameters. These are defined in the AOFINIT member of a NetView DSIPARM data set.
- Copy and customize member INGPTOP in the ING.SINGNPRM library concatenate it in the DSIPARM data set before the SA z/OS libraries. Customize it the system and sysplex names.
- Define and customize the following variable in the NetView style sheet:

  ```
  COMMON.AOF_AAO_SDFROOT_LIST =  SYS1 SYS2 SYS3
  ```

  You may use other panel/tree members than the default members AOFPNLS and AOFTREE for some or additional names like:

  ```
  SYS1 SYS2/MYPNLS SYS3//MYTREE SYS4/MYPNLS2/MYTREE
  ```

  The panel member defaults to AOFPNLS for SYS3. For SYS2 the tree member defaults to AOFTREE. And, for SYS1 both default members are being used.
- Ensure that the inform list in the customization dialog contains SDF for the resources that you want to monitor (consider using, for example, system and sysplex defaults).
- Color and priority assignments for resource status types. These have default values that are set up by SA z/OS (see *IBM Tivoli System Automation for z/OS User's Guide* for details), but you can define overrides to color and priority assignments with the SA z/OS customization dialog.
- SDFROOT. You can specify a root name for the SDF tree 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 23: Check for Required IPL

SysOps	ProcOps	I/O Ops
✓	✓	✓

An IPL is only required if:

- In "Step 4A: Update IEAAPF*xx*" on page 59, you used the IEAAPF*xx* member to define authorized libraries to the APF
- In "Step 4D: Update LPALST*xx*" on page 61 you decided ***not*** to use the solution to dynamically add the modules to the LPALST
- In "Step 4E: Update LNKLST*xx*" on page 61 you updated LNKLST and you decided ***not*** to use the solution to dynamically add the modules to the LNKLST

- “Step 4F: Update IEFSSN*xx*” on page 62 was required because the IEFSSN*xx* member was not updated during NetView installation and you cannot use the z/OS command SETSSI for a dynamic update of the subsystem name table.

Step 24: Automate System Operations Startup

SysOps	ProcOps	I/O Ops
✓	✓	

Sample: INGECOM

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:

Sample 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 in 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 CNMSJ010,JOBNAME=SYSVSSI,SUB=MSTR'
COM='S INGENVSA,JOBNAME=SYSVAPPL,SUB=MSTR'
```

   Note:

   CNMSJ010 is the name of the sample that is provided by NetView that you copied in “Step 5: Customize SYS1.PROCLIB Members” on page 63.

   INGENVSA is the name of the sample that is provided by SA z/OS that you copied in “Step 5: Customize SYS1.PROCLIB Members” on page 63.

3. Adapt the NetView Application and NetView Subsystem Interface jobname to agree with the four-character prefix defined in the IEFSSNxx member, which is described in “Step 4F: Update IEFSSN*xx*” on page 62. For example, if the name of the NetView Application jobname is SYSVxx, SYSV must be specified in the IEFSSnxx member as the character prefix.

Sample 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, 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 that the automation manager should be started on 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 18A: Build the Control Files” on page 104.

To enable automatic startup of the automation manager whenever SA z/OS is started, add the following start command for the automation manager to the COMMND*xx* PARMLIB member:

```
S INGEAMSA,JOBNAME=AM,SUB=MSTR
```

You can find the sample startup procedure called INGEAMSA in the SINGSAMP sample library.

Step 25: 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 23: Check for Required IPL” on page 111. Then start SA z/OS.

   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. Check that the subsystem status and automation flag settings are what you expect. Enter the DISPSTAT ALL command to display the status of automated subsystems and the DISPFLGS command to display the automation flag settings: See *IBM Tivoli System Automation for z/OS Operator's Commands* for information about these commands.
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 26: Install an SA z/OS Satellite

SysOps	ProcOps	I/O Ops
*		

This step is only required if your enterprise runs an Automation NetView and a Networking NetView with GMFHS on the focal point system or on another focal point NetView. You must then install SA z/OS on the automation NetView that is used for system automation.

Step 26A: 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 17 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 17. 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 26B: 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.

NetView style sheet

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

- For a satellite SA z/OS on a Networking NetView:

```
TOWER = SA
TOWER.SA = SATELLITE
```

- For full SA z/OS:

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

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 27: Installing and Customizing the NMC Focal Point

SysOps	ProcOps	I/O Ops
*	*	

Communication between SA z/OS and the NMC focal point is maintained by the SA z/OS topology manager. An SA z/OS topology agent on each target system retrieves the enterprise data from the automation manager. The SA z/OS topology manager on the focal point provides the information into RODM. GMFHS takes the information from RODM and presents it in a graphical form on the NMC workstation. This information is available if you have completed the previous installation steps, that is, SA z/OS is fully functional.

There are two possible configurations when setting up the NMC focal point:

1. Full SA z/OS

2. A satellite SA z/OS on a Networking NetView

The following sections describe how to customize the SA z/OS topology manager for the operators.

Step 27A: Preparing for NMC

Some of the tasks in this step are different for full SA z/OS and a satellite SA z/OS, as indicated.

1. **Applications Required by NMC**

   The applications that NMC uses must be available, so make sure of the following:

   - RODM is running and the RODM load function has loaded the data model into RODM
   - GMFHS and MultiSystem Manager are installed and working

   For information about 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*
   - *Tivoli NetView for z/OS MultiSystem Manager User's Guide*

2. **Configuration**

   Perform the following configuration:

   - **Full SA z/OS:** Import the *NMC best practice policy that is delivered with SA z/OS into your policy database and customize its definitions there to fit your environment.
   - **SA z/OS Satellite:** You must start the environment manually.

   SA z/OS delivers a NetView automation table fragment AOFMSGST that automates this setup.

   - **Full SA z/OS:** You must define this fragment 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.

     Alternatively, you can specify the following statement in the NetView style sheet:

     ```
     TOWER.SA = SYSOPS SATELLITE
     ```
   - **SA z/OS Satellite:** Specify the following statement in the NetView style sheet:

     ```
     TOWER.SA = SATELLITE
     ```

   For additional information, refer to the description of the NetView style sheet and AOFMSGST in “Step 26B: Customize the Networking NetView or Focal Point NetView DSIPARM Data Set” on page 115.

3. **Security**

   For security considerations, refer to “Securing Focal Point Systems and Target Systems” on page 153.

4. **NetView Operator Tasks**

   The RODM name and RODM user must be customized in member AOFRODM on the focal point system (see “Step 26B: Customize the Networking NetView or Focal Point NetView DSIPARM Data Set” on page 115). Customizing AOFRODM on any other system is not necessary.

   - **Full SA z/OS:** You must define the following Automation Operators in the customization dialog for *both* the satellite and target systems:

- EVTOPER (the default for the primary is AUTEVT1 and for the backup is AUTEVT2)
- HBOPER (the default is AUTHB)
- HBSLV (the default is AUTBSLV)
- POSTOPER (the default is AUTPOST)
- POSTSLV (the default is AUTPOSTS)

Note: If the task defined on the target systems is different to the task defined on the satellite, INGSEND definitions must be defined with the customization dialogs to provide the mapping by using the SEND COMMAND OPERS policy item of the Enterprise policy object.

These automation operator definitions are included in the *NMC best practice policy. Customize them there to fit your environment.

You must also define these automation operators in DSIOPF or RACF or both.

- **SA z/OS Satellite:** No customization is required because this is done automatically by SA z/OS during the initialization of the satellite.

5. **SA z/OS Data Storage**

   Two repositories are provided for SA z/OS data:

   - The automation manager (for target systems)
   - RODM (for the focal point)

6. **NetView Common Global Variables**

   You must set the following NetView common global variables for the *target* system. Set them in the NetView style sheet. The defaults are underlined.

AOFUPDAM

Determines whether SA z/OS data should be stored in the automation manager:

		Can Be Set For:	
Value	**Meaning**	**SA z/OS**	**Satellite**
YES	SA z/OS data is stored in the automation manager.	✓	X
NO	SA z/OS data is *not* stored in the automation manager.	✓	✓

AOFUPDRODM

Determines whether SA z/OS data should be stored in RODM:

		Can Be Set For:	
Value	**Meaning**	**SA z/OS**	**Satellite**
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 if AOFUPDRODM has been set to YES.

Value	Mechanism	Can Be Set For: SA z/OS	Satellite
YES	Alerts	✓	✓
NO	Command Handler	✓	X

Setting the values of AOFUPDAM, AOFUPDRODM and AOFSENDALERT on a Networking NetView (for a satellite) or Focal Point NetView is not necessary because this is done automatically.

AOFUPDAM, AOFUPDRODM and AOFSENDALERT must be set to the same value on each target system in a sysplex.

AOFUPDAM used in conjunction with AOFUPDRODM will control if and where the SA z/OS data is stored, as shown in Table 18.

Table 18. Use of AOFUPDAM and AOFUPDRODM to Control SA z/OS Data Storage

AOFUPDAM	AOFUPDRODM	Storage Outcome	Usage
YES	YES	SA z/OS data stored in the automation manager and also in RODM.	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.
YES	NO	SA z/OS data stored in the automation manager only.	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, may be used in future releases of SA z/OS).
NO	YES	SA z/OS data stored in the RODM only.	NMC user, no requirement to rebuild the RODM SA z/OS data.
NO	NO	SA z/OS data not stored in the automation manager or in RODM.	Non-NMC user.

Step 27B: 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 19 lists the data sets to be modified for this.

Table 19. DSIPARM Members to be modified for the SA z/OS Topology Manager

DSIPARM Member	Description
AOFOPFFP	System operations automation operator definitions
CNMSTYLE/C*xx*STGEN	NetView system level parameters for NetView initialization
DSI6INIT	Initialization member for the NetView DSI6DST task.

Table 19. DSIPARM Members to be modified for the SA z/OS Topology Manager (continued)

DSIPARM Member	Description
DSICRTTD	NetView CNM router initialization member
DUIFPMEM	NetView focal point definitions
DUIGINIT	GMFHS initialization member
FLCSAINP	MultiSystem Manager initialization member
INGTOPOF	NMC definition member

NetView Stylesheet

Note: This is only necessary if you have chosen to use alert forwarding as your communication method.

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

Although 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, ALERTFWD SNA-MDS must be specified in CNMSTYLE/C*xx*STGEN. If the network does not contain an intermediate focal point, ALERTFWD NV-UNIQ may be specified in CNMSTYLE/C*xx*STGEN.

If ALERTFWD SNA-MDS is specified in CNMSTYLE/C*xx*STGEN, 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 about 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*.

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, as follows:

```
&domain.TPO   OPERATOR    PASSWORD=&domain.TPO
              PROFILEN    AOFPRFAO
```

This definition must be made on the focal points 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 the NetView operator definition file (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.

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
```

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.

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.

INGTOPOF

Define your sysplex to your NMC as described in “Step 27D: Customize the INGTOPOF File” on page 122.

Step 27C: 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 11. Sample of RODM Load Procedure EKGLOADP

Step 27D: 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", 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 in DSIPARM. Processing is as follows:

1. If the local INGTOPOF member exists in DSIPARM, the content of that member will be used by the topology manager.
2. If the local INGTOPOF member does not exist in DSIPARM, the topology manager will attempt to read the INGTOPOF member in DSIPARM.
3. If the INGTOPOF member exists in DSIPARM, the content of that member will be used by the topology manager.
4. If the INGTOPOF member does not exist in DSIPARM, 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 in 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 C, "Syntax for INGTOPOF File," on page 175).

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 C, "Syntax for INGTOPOF File," on page 175.

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 27E: 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 28: Copy and Update Sample Exits

SysOps	ProcOps	I/O Ops
*	*	

Several sample exits are provided in the SINGSAMP library (for example, AOFEXC01). You can use these samples to create your own exits. If 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 29: Install Relational Data Services (RDS)

SysOps	ProcOps	I/O Ops
*		

If you plan to use Relational Data Services (RDS) an extra VSAM cluster needs to be defined in order to make RDS tables persistent.

The sample job INGEMUVS is provided in ING.SINGSAMP to define the VSAM cluster.

Adapt your NetView startup procedure and add DD statement:

```
//INGEMUGL DD DSN=#hlq#.#domain#.EMUGLBL,DISP=SHR
```

You may also refer to sample startup procedure INGENVSA in ING.SINGSAMP.

| **Note:** Due to the maximum records size of 32000 for a VSAM KSCS record, a RDS table row cannot be larger than 32000 bytes.

Step 30: 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.

Step 30A: 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)
```

If CICS is started with option MSGLVL=0, some of the messages may not be passed to automation.

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 &APPLPARMS 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&APPLPARMS'
```

This is also how the start commands are predefined in the sample databases.

Step 30B: 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
```

The EVESTISP program definition in this example is only needed when using the CICS PPI communication.

Add the TYPE=ENTRY definitions shown in the following example to the shutdown program list table (PLT) for each CICS.

```
DFHPLT TYPE=INITIAL,SUFFIX=yy
DFHPLT TYPE=ENTRY,PROGRAM=EVESPLTT
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
DFHPLT TYPE=FINAL
```

Assemble the PLT tables.

Step 30C: 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 z/OS Administration Reference* and *Tivoli NetView for z/OS 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 want to inquire or control a CICS region. This can be simplified by specification of the CICS Console Auto-Install function.

RACF security is provided by z/OS for EMCS and MCS consoles. This function enables a user on NetView with a RACF user ID (ACEE) to open an EMCS console and have the user ID associated with the EMCS console. All commands that are issued to the EMCS console will have the user ID of the NetView user. Furthermore, CICS supports EMCS and MCS consoles with RACF user IDs by inheriting the user ID that is associated with a command from the EMCS or MCS console.

The net result is that for CICS auto-installed consoles, the user ID that is assigned to the console is the user ID that issued the command. In the case of SA z/OS this would be the NetView user's user ID (only if NetView is using RACF to verify user IDs). This means that all tasks in NetView that require consoles will also require RACF user IDs and the appropriate permissions in CICS. This includes all human operators and all auto operators.

For those users who want to have a predefined user ID instead of the all the possible user IDs from NetView, the Console Model Terminal definition should specify a user ID in its definition.

Step 30D: Transaction and Program Definitions

This step describes how to define the standard CICS Automation transactions and programs to CICS. The DFHCSDUP program is used to do this.

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 a group called EVEGRP1.

Before you run it, modify the job as directed in the JCL comments.

When using the CICS PPI, run the EVESJPPI sample job to define the necessary transactions and programs in a group called EVEGRP2.

Step 30E: DFHRPL and the CICS Automation Library

Update the DFHRPL concatenation to add the ING.SINGMOD1 library for every CICS subsystem that is to be managed by SA z/OS.

Note: Do ***not*** add these libraries to the DFHRPL for CICSPlex CMAS subsystems.

Step 30F: Add Libraries for NetView

Uncomment any libraries that you require in the INGENVSA member of the SINGSAMP data set. Refer to the sample for more details.

Step 30G: Installing CICSPlex SM REXX API

The CICSPlex System Manager REXX API is required for the interaction between SA z/OS and the CICSPlex System Manager. The REXX runtime interface to the API is supplied as a function package or host command environment. It should preferably be added to the function package table in the NetView module DSIRXPRM, as shown in "Step 6F: Add the INGRXFPG REXX Function Package" on page 72.

For details about the installation of a function package, see *CICS Transaction Server for z/OS Installation Guide* and *IBM Tivoli NetView for z/OS Tuning Guide*.

Step 31: Install IMS Automation in IMS

SysOps	ProcOps	I/O Ops
*		

Step 31A: 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.

Note: Depending on your security requirements and authority assignments, CMDCMS can also be set to values of R, C, or B. For more information, refer to the *IMS System Definition Reference*.

PREMSG=N

This is required for correct operation of IMS Product Automation.

Note: If PREMSG=Y is selected, all system messages and command responses are issued as multi-line messages. The first line is: `DFS000I MESSAGE(S) FROM ID=XXXX` where `XXXX` is the IMSID. The message starts on the second line. As a result, IMS message automation will not work as expected.

Step 31B: 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 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 Product Automation Programmer's Reference and Operator's Guide* for further customization details.
- Use the exit that is supplied by SA z/OS on its own.
  - This involves concatenating the ING.SINGMOD1 library after the IMS.SDFSRESL 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.SDFSRESL 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 Product Automation Programmer's Reference and Operator's Guide*.

Step 31C: Add Libraries for NetView

Uncomment any libraries that you require in the INGENVSA member of the SINGSAMP data set. Refer to the sample for more details.

In order to issue IMS type 2 commands, access must available to the IMS modules, CSLSRG00 and CSLSDR00. These modules are shipped in the IMS product library named hlq.SDFSRESL. The entire product library can be allocated, or a private data set with just those modules and perhaps an explicit allocation or a LNKLST entry.

Step 32: Install TWS Automation in TWS

SysOps	ProcOps	I/O Ops
*		

Step 32A: Add Libraries to TWS

Add your SINGMOD1 library and the NetView CNMLINK library containing CNMNETV to the TWS steplib. Alternatively, you may add these libraries to LINKLST. You should have already APF-authorized these libraries.

Step 32B: Add Libraries to NetView

Allocate the EQQMLOG library according to your TWS definitions. This data set contains any error messages that may occur when using the TWS APIs on this NetView.

EQQMLIB should point to the appropriate message library for the level of TWS that you are running.

Uncomment any libraries that you require in the INGENVSA member of the SINGSAMP data set. Refer to the sample for more details.

Step 32C: Update TWS Parameters and Exits

Install the exit module EEQUXSAZ. This exit is required for TWS Automation workstation processing.

A recycle of TWS is required to install 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 modules that are supplied by TWS Automation.

TWS Automation supplies EQQUX007 to detect workstations that are used for NetView communication. The following modules are used as part of this process:

```
EQQUX007
UX007001
UX007004
EQQUX011
UX011001
```

EQQUX007 and EQQUX011 are the exit driver programs. They call other modules in turn, as though 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 as the call to EQQUX007 or EQQUX011.

If you want to add additional exit 7 or exit 11 modules, 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 TWS/ESA initialization parameters if you want 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-supplied message members in the SEQQMSG0 data set:

Message	Member
EQQE026I	EQQE02
EQQE036I	EQQE03
EQQE037I	EQQE03
EQQE107I	EQQE10
EQQFCC1I	EQQFCC
EQQN013I	EQQN01
EQQPH00I	EQQPH0
EQQW011I	EQQW01
EQQW065I	EQQW06
EQQW079W	EQQW07
EQQZ006I	EQQZ00
EQQZ086I	EQQZ08
EQQZ128I	EQQZ12
EQQZ200I	EQQZ20
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 for EQQE026I and EQQE036I. This is to prevent you from receiving 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 job names (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 33: Install USS Automation

SysOps	ProcOps	I/O Ops
*		

Step 33A: Define UNIX Segments (OMVS)

Depending on the NetView operator security definition, one or more UNIX segments must be defined. These OMVS segments can have a root UID (0) or a non-root UID. To run a non-root UID requires more setup.

When using OPERSEC=MINIMAL, NETVPW, or SAFPW, one OMVS segment must be defined. This is the segment for the started task user ID running NetView.

When using OPERSEC=SAFCHECK, or SAFDEF (user level security), the following operator IDs need a UNIX segment:

- AUTWRK01-NN
- GSSOPER
- RPCOPER
- MONOPER
- AUTO1
- SYSOPER (backup for GSSOPER)
- BASEOPER (backup task for SYSOPER and GSSOPER)
- All tasks that receive 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 to set up the z/OS UNIX segment. Giving 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: Any user that can change NetView common global variables 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 12 on page 133.

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 12. Job Example of Creating an OMVS Segment

Step 33B: 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 34: Customizing GDPS

SysOps	ProcOps	I/O Ops
*		

This section describes the necessary customization and definitions when running GDPS on top of SA z/OS.

You can also import the best practice policy, *GDPS, which is delivered with SA z/OS, into your policy database and customize its definitions there to fit your environment.

Step 34A: Preparing NetView

1. Concatenate the SGDPPARM product data set to the DSIPARM DD-statement in the NetView startup procedure. See the INGENVSA sample that is provided by SA z/OS 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, for the GDPS controlling system, copy them to your user data sets and make your modifications there.

   INGXKSYS uses the z/OS system symbol &SYSCLONE. as the XCF group ID. This allows the same member to be used for all controlling systems. The resulting XCF group will always be created in a unique way: INGXSG*xx*, where *xx* is the value of &SYSCLONE. This corresponds to HSAPRMKS as described in “Step 34B: Preparing the Automation Manager.”

3. If necessary, 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 adapt the TOWER statements according to your installation.

   Additionally specify the GDPS product of your installation and whether this is the GDPS controlling system (KSYS) or production system (PROD) by removing the asterisk in front of the appropriate line:

   `*TOWER.SA.GDPS=PPRC KSYS`
   : If GDPS/PPRC is installed and this is controlling system

   `*TOWER.SA.GDPS=PPRC PROD`
   : If GDPS/PPRC is installed and this is production system

   `*TOWER.SA.GDPS=HM KSYS`
   : If GDPS/PPRC HM is installed and this is controlling system

   `*TOWER.SA.GDPS=HM PROD`
   : If GDPS/PPRC HM is installed and this is production system

   `*TOWER.SA.GDPS=XRC`
   : If GDPS/XRC is installed for all systems, SA z/OS will initialize all systems with INGXINIT

   `*TOWER.SA.GDPS=GM`
   : If GDPS/GM is installed for all systems, SA z/OS will initialize all systems with INGXKSYS

   `*TOWER.SA.RCMF=PPRC`
   : If RCMF/PPRC is installed

   `*TOWER.SA.RCMF=XRC`
   : If RCMF/XRC is installed

   Note: If the TOWER.SA statement includes GDPS, the VPCEINIT installation exit that is required by each supported GDPS product is automatically called during initialization of SA z/OS. You no longer need to specify it in each system's SYSTEM INFO policy in the customization dialog.

Step 34B: Preparing the Automation Manager

The GDPS controlling system must run in a separate XCF group (subplex) and therefore has its own automation manager. The automation manager parmlib member for the controlling system (K-system) is HSAPRMKS, using the z/OS system symbol &SYSCLONE as the XCF group ID. This allows the same parmlib member to be used for all controlling systems. The resulting XCF group will always be created in a unique way: INGXSG*xx*, where *xx* is the value of &SYSCLONE.

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 34C: Defining the Automation Table Used by GDPS

SA z/OS provides a NetView automation table (AT) that contains all the messages that are required by GDPS. The relevant AT is loaded, depending on the specified GDPS Tower statement, as follows:

Tower Statement	AT loaded
TOWER.SA.GDPS=PPRC	GEOMSGGP
TOWER.SA.GDPS=HM	GEOMSGHM
TOWER.SA.GDPS=XRC	GEOMSGXR
TOWER.SA.GDPS=GM	GEOMSGGM

Note: If the TOWER.SA statement includes GDPS, the INGMSGGP automation table that is required by each supported GDPS product is automatically loaded during initialization of SA z/OS, only if INGMSG01 (which is also the default) is specified in the system's SYSTEM INFO in the customization dialog. If this is not the case, you should also add INGMSGGP to the list of automation tables.

You can use the following AT fragments to process messages for the GEOMSG*xx* ATs that are supplied by GDPS:

- INGMSGG1 for messages that should not flow into the GEOMSG*xx* ATs
- INGMSGG2 for messages that do not have an entry in the GEOMSG*xx* ATs

For messages that should be processed by a user AT as well as the GDPS ATs, you should use a separate AT that is activated in parallel. You can achieve this by specifying multiple AT members in the AUTOMATION SETUP definitions for the system (SYS).

Step 35: Customizing I/O Operations

SysOps	ProcOps	I/O Ops
		✓

Step 35A: Define OMVS Segment

The TCP/IP socket API that is used by I/O operations requires the definition of an OMVS segment for the user that is assigned to I/O operations when the application is started. Note that I/O operations must be started as a “started task”.

You can omit this step if the OMVS segment already exists for the user that is assigned to the I/O operations application.

Execute the following RACF commands that provide the necessary security definitions. The RDEFINE command assumes that the name of the I/O operations started task begins with IHV:

```
ADDGROUP ihvgrp OMVS(GID(nnn) [SHARED])

ADDUSER  ihvusr OMVS(UID(nnn) [SHARED]) DFLTGRP(ihvgrp) NOPASSWORD

RDEFINE  STARTED ihv*.* STDATA(USER(ihvusr) GROUP(ihvgrp))

SETROPTS GENERIC(STARTED) RACLIST(STARTED) REFRESH
```

GID and UID can have the same value. SHARED needs to be specified if the GID value or the UID value is already in use. For more information about the security definitions see the chapter “RACF command syntax” in *z/OS Security Server RACF Command Language Reference*.

Step 35B: Prepare I/O Operations Startup

This section describes optional customization when running I/O operations that you can make by editing the I/O operations startup JCL (see Figure 13).

```
//IOOPS    EXEC PGM=IHVOINI,    **IHV INITIALIZATION MODULE NAME**
//             TIME=1440,       **RUN FOREVER**
//             REGION=0M,       **REGION SIZE**
//             DPRTY=(15,15),   **PRIORITY OF TASK**
//             PARM=''
//*
//STEPLIB  DD  DISP=SHR,DSN=#hlqinst#.SINGMOD1
//HCDTRACE DD  DISP=SHR,DSN=#hlq#.&SYSNAME..HCDTRACE
//*HCDPROF  DD  DISP=SHR,DSN=#hlq#.HCDPROF
```

Figure 13. Startup JCL of I/O operations

You can add one or more of the following definitions for the PARM parameter:

`COMM={TCP|VTAM}`
This parameter restricts communication to TCP/IP or VTAM only.

Note: Running a mix of I/O operations applications, some started with COMM=TCP and some with COMM=VTAM, leads to unpredictable results.

COMM=TCP should only be specified when ***all*** I/O operations applications run SA z/OS V3.2 or higher.

`CT=xx` This parameter defines the suffix of the CTIIHV*xx* PARMLIB member that I/O-OPS uses when registering the component trace. If you omit this parameter I/O-OPS uses the default CTIIHVZZ member.

`MSG={MC|UC}`
This parameter defines the appearance of messages:

- MSG=MC leaves the message in mixed case as defined in the message module.
- MSG=UC translates each message to uppercase before it is issued.

If you omit this parameter I/O operations checks the environment for the following languages:

CHS	Chinese Simplified
CHT	Chinese Traditional
ENP	US English Uppercase
JPN	Japanese
KOR	Korean
TAI	Thai

If any of these languages is installed, each message is translated to uppercase before it is issued.

`TIMEOUT=0–999999`
This parameter sets the timeout value of the very first I/O operations application to the specified value. All other I/O operations applications

ignore the parameter because they inherit the timeout value from the first running I/O operations application that the new application communicates with.

`TPNAME=`*`tpname`*

This parameter specifies the TCP/IP procedure name that is used for communication.

In a multi-stack environment (CINET) TCP/IP allows up to 8 different address spaces running in parallel on a single MVS image. This parameter restricts the TCP/IP communication of I/O operations to the specified procedure. Otherwise the first active procedure is used.

Note: Do not specify the parameter in a single-stack environment (INET).

Two or more parameters must be separated with a comma.

Step 36: Installing Tivoli Enterprise Portal Support

SysOps	ProcOps	I/O Ops
*		

If you plan to use the SA z/OS monitoring agent you must perform the SMP/E installation of the support for the Tivoli Enterprise Portal (TEP). For further details, refer to *IBM Tivoli System Automation for z/OS Monitoring Agent Configuration and User's Guide* and *IBM Tivoli Monitoring Services: Program Directory*.

You can import the best practice policy, *ITM, which is delivered with SA z/OS, into your policy database and customize its definitions there to fit your environment.

Chapter 8. Installing SA z/OS Workstation Components

This chapter contains information about 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 145
- "Installing and Customizing IBM Tivoli Netcool/OMNIbus" on page 146
- "Installing and Customizing Tivoli Service Request Manager through Tivoli Directory Integrator" on page 148

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 that are 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 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):

  INGNMCZP is the packed file for Windows. Download it with the extension ZIP and unpack with an appropriate tool (WINZIP or PKZIP).
- ING.SINGPWS1(INGNMCTZ):

  INGNMCTZ is the SA z/OS workstation code for AIX, UNIX and z/Linux workstations.

  Step 1. Download the member (INGNMCTZ) from the data set on the host system to your workstation in *binary* mode using, for example, FTP.

Step 2. Rename INGNMCTZ to INGNMCTZ.tar.gz on the workstation.

Step 3. Uncompress with the command:

```
gzip --decompress --verbose INGNMCTZ.tar.gz
```

Step 4. Unpack with the command:

```
tar --extract --verbose --file=INGNMCTZ.tar
```

This creates the subdirectory INGNMCEX on the workstation.

- 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 support for system operations and 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 must be done manually, because 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.

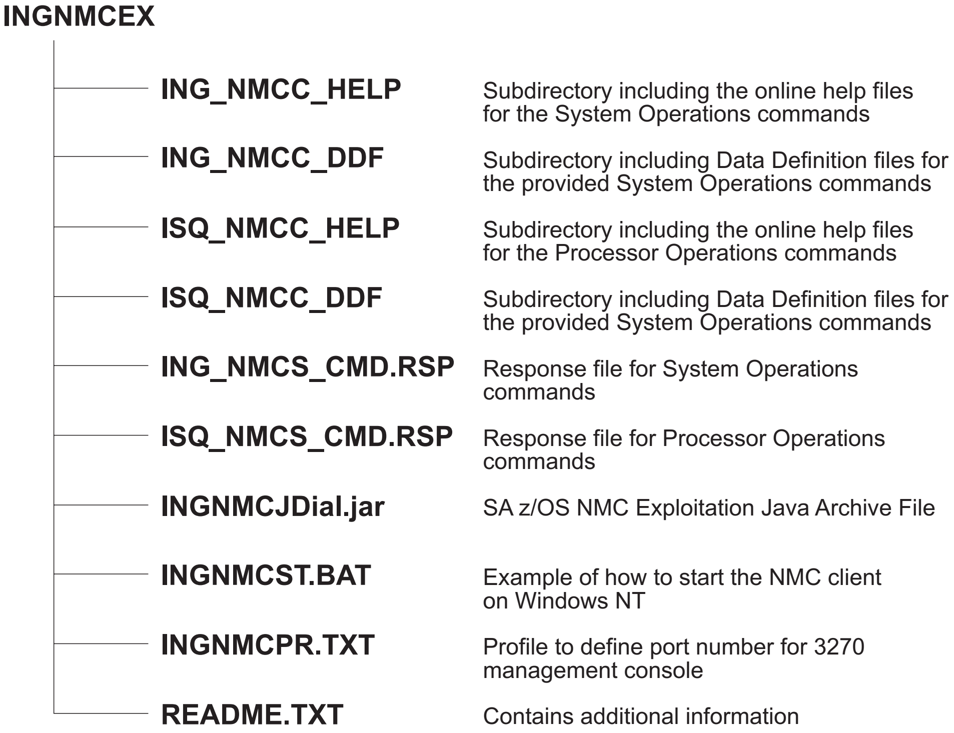

INGNMCEX
ING_NMCC_HELP
Subdirectory including the online help files for the System Operations commands
ING_NMCC_DDF
Subdirectory including Data Definition files for the provided System Operations commands
ISQ_NMCC_HELP
Subdirectory including the online help files for the Processor Operations commands
ISQ_NMCC_DDF
Subdirectory including Data Definition files for the provided System Operations commands
ING_NMCS_CMD.RSP
Response file for System Operations commands
ISQ_NMCS_CMD.RSP
Response file for Processor Operations commands
INGNMCJDial.jar
SA z/OS NMC Exploitation Java Archive File
INGNMCST.BAT
Example of how to start the NMC client on Windows NT
INGNMCPR.TXT
Profile to define port number for 3270 management console
README.TXT
Contains additional information

Figure 14. 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 (note that 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 14.
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 that you downloaded the files to.

Note: BINDIR is an environment variable that is 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 about 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:

   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 in 8 to the individual operators defined in your installation. Only these operators that are linked to one of the SA z/OS profiles can execute SA z/OS commands. No other operators can display or execute SA z/OS commands.

   For more details on CPEBATCH refer to the appendix 'Topology Server Commands' in *Tivoli NetView for z/OS: NetView Management Console User's Guide*.

Notes:

a. The NetView CPE online utility was retired with NetView 5.1. Installations that are 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 such as 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:

```
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. See *NetView Management Console User's Guide* for information about 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
   ```

   See Figure 15 on page 144 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, which 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. Click the **Add** button, then the **Save** button to save your changes.

   h. Click the **Done** button to exit this window.

   i. In the NMC, select the newly-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 15. Sample to Start the NMC (for WIN Environment)

Installing and Customizing the TEC Event Server Workstation

It is assumed that you have the TEC event server workstation installed and verified before you begin with the following customization for SA z/OS. For details see the product manuals.

For more information about the infrastructure on host systems, refer to “Step 16: Customization of Alert Notification for SA z/OS” on page 99.

Although the TEC event server workstation can run on various operating systems the following example describes the installation and customization on AIX.

1. Download the sample file ING_event.tar from the host system to your workstation as a binary file.
   a. To download the files, you can use, for example, FTP. Choose as the target path name any directory where you want to temporarily store the sample file:
   ```
   cd <PATH>
   ```
   b. Start FTP with:
   ```
   ftp <hostname>
   ```
   c. You will be prompted to enter your user ID and password. After logging on to your z/OS system, enter:
   ```
   bin
   get /usr/lpp/ing/dist/TEC/ING_event.tar
   quit
   ```
2. Unpack the package file <PATH>/ING_event.tar:
   ```
   tar -xvf <PATH>/ING_event.tar
   ```
   This unpacks the workstation code for subsequent installation into the current directory (<PATH>).
3. Install the appropriate Tivoli installation package:
   a. From the Tivoli desktop select **Install > Install Product** and follow the Install Product dialog.
   b. Set the media path to the <PATH> that contains the SA z/OS-specific installation package.
   c. Select the product to be installed.
   d. Close the Install Product dialog after installation.
4. Verify the installation.

   During installation files are stored in a directory that is pointed to by the environment variable BINDIR. By 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. The following files should be present:

Member name	Type	Purpose
ING_event.baroc	TEC *baroc* file	Defines event classes
ING_event.rls	TEC *rls* file	Defines rules

   For reference, the above files are also available in /usr/lpp/ing/dist/TEC/.

Activating the Installed Files

The following instructions describe the steps required to activate the installed files at the TEC event server by using an existing rule base. See *Tivoli Enterprise Console® Reference Manual* for a detailed description of the following commands:

1. Import the class file (.baroc) into the rule base:
   ```
   wrb-imprbclass ING_event.baroc <rbname>
   ```
2. Import the rules file (.rls) into the rule base:
   ```
   wrb -imprbrule ING_event.rls <rbname>
   ```
3. Compile the rule base:
   ```
   wrb -comprules <rbname>
   ```
4. Load the rule base into the TEC event server:
   ```
   wrb -loadrb -use <rbname>
   ```
5. Stop the TEC event server:
   ```
   wstopesvr
   ```
6. Start the TEC event server:
   ```
   wstartesvr
   ```

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 Enerprise Console User's Guide*.

In Tivoli, you may monitor events belonging to a group that may originate from a certain source or from different sources. In order to enable the TEC event server to handle 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* SAZOS to your event server:
   ```
   wcrtsrc -l "SA z/OS Events" SAZOS
   ```
2. Define an event group by using the source attribute SAZOS as a filter criterion:
   ```
   wconsole -crteg -n <eg-name> -D "All SA z/OS Events"
   wconsole -addegflt -E <eg-name> -D "Source SAZOS" -s "source='SAZOS'"
   ```
3. Assign the defined event group to a Tivoli administrator's console:
   ```
   wconsole -assigneg -C <console-name> -E <eg-name>
   ```

See *Tivoli Enterprise Console Command and Task Reference Manual* for a detailed description of these commands.

Installing and Customizing IBM Tivoli Netcool/OMNIbus

Because SA z/OS uses Tivoli Event Integration Facility (EIF) events for communication you need the following components:

- IBM Tivoli Netcool/OMNIbus (OMNIbus)
- The OMNIbus Probes Library for Nonnative Base
- The Tivoli EIF Probe (EIF Probe)

It is assumed that you have all of the above installed and verified before you begin with the customization for SA z/OS. For details please see the product manuals.

| For more information about the infrastructure on host systems, refer to "Step 16: Customization of Alert Notification for SA z/OS" on page 99.

Although OMNIbus can run on various operating systems the following example describes the installation and customization on Windows 2003 Server.

1. Download the sample files ING_event.rules and ING_db_update.sql from the host system to your workstation as text files:
   a. To download the files, you can use, for example, FTP. Choose as the target path name any directory where you want to temporarily store the sample files:
      ```
      cd <PATH>
      ```
   b. Start FTP with:
      ```
      ftp <hostname>
      ```
   c. You will be prompted to enter your user ID and password. After logging on to your z/OS system, enter:
      ```
      ascii
      get /usr/lpp/ing/dist/OMNIbus/ING_event.rules
      get /usr/lpp/ing/dist/OMNIbus/ING_db_update.sql
      quit
      ```
2. Inspect ING_db_update.sql. This file creates new columns in your ObjectServer's alert.status table that will later hold the information from the SA z/OS events. It will also add some triggers and a trigger group. Normally you should not have to change this file.
3. Update the alert.status table of your ObjectServers:
   a. Run the SQL processor:
      ```
      %OMNIHOME%\bin\redist\isql.exe -S <server> -U <username>
      -P <password> -i <PATH>/ING_db_update.sql
      ```
   b. Repeat the previous step for each ObjectServer.
4. Adapt your EIF Probe tivoli_eif.rules. There are two possibilities:
   - Your Tivoli EIF Probe is for SA z/OS events only so you can simply replace the original rules file with the one supplied by SA z/OS:
     ```
     copy ING_event.rules C:\Program Files\IBM\Tivoli\Netcool\omnibus\
     probes\win32\tivoli_eif.rules
     ```
   - Otherwise you must merge the logic of ING_event.rules into your existing tivoli_eif.rules
5. Restart your ObjectServers and your EIF Probe.

Customizing the Triggers

ING_db_update.sql installs a trigger called ing_count_events. This trigger is designed to prevent multiple lines to be displayed for multiple occurrences of the same event. Instead of that it maintains a counter that is increased each time the same event arrives repeatedly. The ing_count_events trigger is initially disabled because the installation process of the EIF Probe installs another trigger called deduplication. If you have both triggers enabled your event counter will be increased twice.

You should proceed based on the following options:

- Your EIF Probe is for SA z/OS events only: It is recommended that you have ing_count_events enabled and deduplication disabled.

- Your EIF Probe is also for other events: You must review both triggers and merge the logic.
- You want to see all occurrences of an event as a separate line: You must disable both triggers.

Note that you can manipulate the triggers in IBM Tivoli Netcool/OMNIbus Administrator by connecting to your ObjectServers and selecting **Automation > Triggers**.

Customizing the Event View

The event views of IBM Tivoli Netcool/OMNIbus Conductor can be customized to show the fields that have been newly inserted into the alert.status table for SA z/OS events. In the event view select **Edit > Edit View**.

A recommended setup is:
- Node
- AlertGroup
- Summary
- Tally
- INGEventDate
- INGEventTime
- INGEventResName
- INGEventResType
- INGEventResSystem
- INGEventJobname

Note: SA z/OS uses the OMNIbus event class 89320. Make sure that you define this class.

Installing and Customizing Tivoli Service Request Manager through Tivoli Directory Integrator

Because SA z/OS integrates with IBM Tivoli Service Request Manager (TSRM) through IBM Tivoli Directory Integrator (TDI) you need the following components:
- TSRM and all prerequisite software
- TDI Runtime Server and Config Editor

It is assumed that you have all of the above installed and verified before you begin with the customization for SA z/OS. For details see the product manuals.

To create a trouble ticket from SA z/OS in TSRM there are no adaptations required in TSRM. Everything is done in TDI. Although TDI can run on various operating systems the following example describes the installation and customization on Windows 2003 Server.

1. Download the sample file `ING_event.xml` from the host system to your workstation as a text file:
   a. To download the file, you can use, for example, FTP. Choose as the target path name any directory where you want to temporarily store the sample files:
      ```
      cd <PATH>
      ```
   b. Start FTP with:
      ```
      ftp <hostname>
      ```
   c. You will be prompted to enter your user ID and password. After logging on to your z/OS system, enter:

```
ascii
get /usr/lpp/ing/dist/TDI/ING_event.xml
quit
```

Customizing the AssemblyLines

To perform the steps described in this section you should be familiar with the TDI Config Editor. A good overview can be found in *IBM Tivoli Directory Integrator User's Guide*.

The sample file ING_event.xml defines two AssemblyLines:

- TicketServer that receives a request from SA z/OS, starts TicketWriter and returns a response
- TicketWriter that parses the request and creates a trouble ticket in TSRM

Note that if you have a different service desk than TSRM you can adapt TicketWriter to feed your application. TicketServer can remain the same.

Because they are samples, the AssemblyLines will probably not work unchanged in your environment. You should review both and make any necessary adaptations:

1. Start the TDI Config Editor and open <PATH>ING_event.xml.
2. Modify the AssemblyLine TicketServer as follows:
   a. Open TicketServer and select the **Data Flow** tab.
   b. Open the ReadXML component in the **Feeds** section.
   c. Adapt the port number. This is a TCP Connector working in server mode. The **Config** tab shows the port number that the server listens to. A value of 8000 is provided in the sample but you are free to change it.
   d. Leave the other components unchanged.
   e. Start the Ticketserver
3. Modify the AssemblyLine TicketWriter:
   a. Open TicketWriter and select the **Data Flow** tab.
   b. Modify how the details text is generated:
      1) Review all of the components with names like Map...Description.
      2) The FixDescription and SpecificDescription attributes are set to text that is formatted with the attributes that are mapped by the Map...Attributes components. You can adapt the text to your needs here.
   c. Modify the TSRM settings:
      1) Open the WriteTicket component. This is a Generic Maximo® Connector.
      2) Adapt the TSRM communication settings. Select the **Config** tab. Specify various options that must match your TSRM installation:
         a) On the **MEA Server** tab you must specify the URL (server address and port) of your TSRM.
         b) On the **MEA Objects** tab you must specify setting such as the external system name and the names of the Web services for CREATE, DELETE, QUERY and UPDATE operations.
         c) Leave the **MEA Advanced** tab as it is.
      3) On the **Output Map** tab the TicketWriter sample maps DESCRIPTION and DESCRIPTION_LONG DESCRIPTION, as well as REPORTEDPRIORITY, URGENCY and IMPACT. You can also use this tab to map fixed installation-dependent values.

The sample maps the REPORTEDBY user ID to the value SAZOS. You may want to change this or add other user IDs, or do both.

Part 3. Appendixes

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)
  - RODM access information
- An SAF-based security product such as RACF

NetView facilities limit the 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. SA z/OS provides the sample INGESCAT for NetView authorization.

RACF can be used to limit the use of z/OS system commands to authorized operators. SA z/OS provides the sample INGESAF for a RACF environment.

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.

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 automation function that collects, displays, compares, and deletes IPL information uses two started tasks. It is recommended that you 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. Because the started task and the command can delete IPL information, both need RACF CONTROL access to the VSAM data set. The started task that collects 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) because this utility requires a fixed ddname. The input and output data sets that are used by the second started tasks are dynamically allocated and deleted by the NetView address space. This requires 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 to the started task (the IBM default is STCUSER). 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 sets are built as follows:

```
hlq.cdstype.Svvvvvv
```

Where:

hlq
is the high-level qualifier for couple data sets defined during the customization

cdstype
is ARM, CFRM, LOGR, SFM, SYSPLEX

Svvvvvv
is the volume name from the list of Alternate 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 sets 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

Access to JES2 Spool Output Data Sets

The task INGTJLM processes JES2 spool output data sets. It runs under the NetView userid. For this reason, the NetView userid must be granted READ access to the class JESSPOOL in general or to those data sets in this class which will be monitored. The data set name of a JES2 spooled data sets is built as follows:

```
uid.jobnm.jobid.xxx *
```

Where:

uid
userid that owns the job

jobnm
job name

jobid
identifier of the job

xxx
may be one of the following:

- JESMSGL
- JESJCL

- JESYSMSG
- D000nnnn

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 INGCF commands should be granted to certain operators only. To do this:

- Restrict access to the INGRCCHK command for the keyword INGPLEX or INGCF, and certain given values
- Permit certain operators or groups of operators to access these restricted commands, keywords, and values

To achieve this, use the NetView command authorization table or SAF command authorization.

The following keywords and values are applicable for restricting access to the functions of the INGPLEX and INGCF commands:

Keyword	Value	Allows for
INGPLEX	CDS	• Allocating an alternate CDS with the INGPLEX CDS command • Controlling the SDUMP options and the SLIP traps sysplexwide
INGCF	STR	• Forcing the deallocation of a CF structure with the INGCF STRUCTURE command • Rebuilding a CF structure on another CF with the INGCF STRUCTURE command • Controlling the SDUMP options and the SLIP traps sysplexwide
INGCF	CF	• Preparing a CF for removal from the sysplex with the INGCF DRAIN command • Integrating, or reintegrating, a CF into a sysplex with the INGCF ENABLE command • Including the keyword INGCF with the value STR
INGPLEX	HW	• Deactivating the LPAR of a CF with the INGCF DRAIN command • Activating the LPAR of a CF (equivalent to starting the Coupling Facility Control Code) with the INGCF ENABLE command • Including the keyword INGCF with the value CF

To activate the authorization check via the NetView command authorization table, add the protect and permit statements for the INGRCCHK command, the INGPLEX and INGCF keywords and the CDS, STR, CF and HW values as shown in the following example:

```
PROTECT  *.*.INGRCCHK.INGPLEX.CDS
PROTECT  *.*.INGRCCHK.INGCF.STR
PROTECT  *.*.INGRCCHK.INGCF.CF
PROTECT  *.*.INGRCCHK.INGPLEX.HW
```

```
PERMIT GRP3  *.*.INGRCCHK.INGPLEX.CDS
PERMIT GRP5  *.*.INGRCCHK.INGPLEX.HW
PERMIT GRP3  *.*.INGRCCHK.INGCF.STR
PERMIT GRP4  *.*.INGRCCHK.INGCF.CF
```

With these definitions operators of group GRP3 are authorized to issue all functions of the INGPLEX CDS and the INGCF STRUCTURE commands.

Operators of group GRP4 are authorized to issue all functions of the INGCF CF and the INGCF STRUCTURE commands, but are not authorized for the functions of the INGPLEX CDS commands.

Restricting Access to Joblog Monitoring Task INGJLM

The task INGTJLM processes JES2 spool output data sets. It runs under the NetView userid. For this reason, the NetView userid must have read access to the data sets being monitored. However, the permission allows all NetView users to read the spool data, even sensitive data, using the command INGJLM unless the command is restricted. Use the NetView command authorization table (see below) or the equivalent SAF command authorization to restrict the parameters START, STOP, and SUSPEND.

```
PROTECT *.*.INGJLM START
PROTECT *.*.INGJLM.STOP
PROTECT *.*.INGJLM.SUSPEND
PERMIT grpx *.*.INGJLM START
PERMIT grpx *.*.INGJLM STOP
PERMIT grpx *.*.INGJLM.SUSPEND
```

Security for IBM Tivoli Monitoring Products

This section describes security options for controlling access to IBM Tivoli Monitoring products (in particular for OMEGAMON XE) and to OMEGAMON classic monitors.

Controlling Access to IBM Tivoli Monitoring Products

The IBM Tivoli Monitoring (ITM) platform offers a series of Simple Object Access Protocol (SOAP) requests that can be issued from z/OS. SOAP is a communications XML-based protocol that lets applications exchange information through the Internet. For further information about creating SOAP messages, see “Appendix C. Tivoli Enterprise Monitoring Web services” in *IBM Tivoli Monitoring: Administrator's Guide*.

Authentication of users (autotasks or operators) is done based on <userid> and <password> tags that are specified in a SOAP request, if security is enabled. Note, however, that before a SOAP request can be issued the user must be logged on to NetView.

The SOAP request is sent to the hub Tivoli Enterprise Monitoring Server (monitoring server) that is supplied in the INGOMX command and processed there.

SOAP requests can be authorized in terms of both user and hub monitoring server via a user access list. They can be further restricted to groups of users and particular SOAP servers using command authorization table identifiers however final authorization is performed on the hub monitoring server based on the user access list and logon validation.

The relevant keywords that are supported by the INGOMX command are SERVER and IPADDR:

- SERVER allows access based on either the server object that is defined in the SOAP SERVER policy item of a NTW policy object, or a host name. Note that you can only specify the first 8 characters for long host names.
- IPADDR allows access based on IP addresses, however this must be for all IP addresses or none because an address cannot be specified in the command authorization table.

Table 20 on page 159 shows the SA z/OS command names, keywords, and values that can be protected along with their associated SAF resource or command authorization table identifier.

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 user ID must be defined to SAF for external product level security or to OMEGAMON for internal product level security.

For commands that are protected only by internal security, command locking must be enabled for this user ID, 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 INITIALƀ rule. In the absence of INITIAL*n* rules, the command authority level for SA z/OS is always 0. For further details, see 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 user ID 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, see the *NetView Security Reference* manual.

The common user ID 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 in OMEGAMON to permit access to the monitor.

Table 20 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 20. Command Authorization Identifiers

Commands and Keywords	Command List Name	SAF Resource or Command Authorization Table Identifier
INGOMX NAME CMD SERVER IPADDR	INGROMX0	*netid.luname*.INGROMX0 *netid.luname*.INGROMX0.NAME.*session_name* *netid.luname*.INGROMX0.CMD.*command* *netid.luname*.INGROMX0.SERVER.*server_name* *netid.luname*.INGROMX0.IPADDR
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, all applications denoted by the OMEGAMON applid that share the same password must be assigned to a single owner. You define the owner in the NETWORK (NTW) entry type with the AUTHENTICATION policy item. On the Authentication Definitions panel enter your definitions in the **Owner** and **Share** fields. See “AUTHENTICATION Policy Item” in *IBM Tivoli System Automation for z/OS Defining Automation Policy* for more details about this panel.

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. See *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 for user `oper1` and owner `AOMON`, the GETPW command format would be:

```
GETPW oper1 AOMON,INIT=pw,MASK=@(#) 82 1.30.4.51@(#)N%N@(#) 82 1.30.4.51@(#)A@(#) 82 1.30.4.51@(#)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, ensemble HTTP 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 Ensemble HW commands

Each ensemble defined in your SA z/OS policy database must have a corresponding resource profile defined with your SAF product. The skeleton of the ensemble resource is:

```
ISQ.ENS.ensemble
```

The ensemble part of the resource name corresponds with the ensemble entry name definition specified in the customization dialog.

The following example shows how to define an ensemble resource in RACF:

```
SETROPTS CLASSACT(FACILITY)
SETROPTS RACLIST(FACILITY)
RDEFINE FACILITY ISQ.ENS.ENSR35 UACC(NONE)
PERMIT ISQ.ENS.ENSR35 CLASS(FACILITY) ID(stcuser) ACC(ALTER)
```

Levels of ensemble access

The following lists the access levels and their meaning for the ensemble resources:

- READ: Retrieve, get configuration information from the ensemble objects
- CONTROL: Initialize, discover and terminate the ensemble session
- ALTER: Issue operations management commands of the zBX objects:
  - ACTIVATE
  - DEACTIVATE

Depending on the NetView operator security (OPERSEC) chosen, the access level is checked differently. If your NetView operator security is set to MINIMAL, NETVPW, or SAFPW, the user ID that is checked for hardware access is always the user ID that started the NetView address space, which is usually a STC user ID. This user ID has to be authorized for all ensemble 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, several NetView autotasks need to be authorized to access the ensembles that are defined in the customization dialog. Refer to “Defining the CPC Access Lists” on page 163 for further details.

Password Management

Connecting to the ensemble HMC Web Services API requires authentication with a valid HMC user ID and password. Note that when a password is specified, it appears in readable format in the automation configuration file and in logs. When SAFPW is specified, the password is stored in a VSAM data set in an encrypted format. You define the userid and password for ensembles in the ENSEMBLE INFO policy item.

Use the predefined value SAFPW to allow NetView to maintain the password of the user ID.

See ENSEMBLES Policy Item in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

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 ensemble HMC
- *owner* is the name of the entry as used by the SA z/OS dialogs for the zEnterprise ensemble.

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. See *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. The HMC password value must be 4-8 characters long in order to be used with GETPW. Whenever a logon is made to HMC Web Services API, 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 the HMC, the current password is used to authenticate the user ID. If a new password is available, the new password is also changed on the HMC. Upon successful password update on the HMC, 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 the HMC are the same, in particular if you plan to use an alternate focal point. In this case, the password data sets should be shared by the group of systems where focal point can run.

Use the GETPW command to initialize the password data set. For example, suppose the session and password share definitions are set as in for HMC user ensoper1 and owner ISQE, the GETPW command format would be:

```
GETPW ensoper1 ISQE,INIT=pw,MASK=@(#) 82 1.30@(#)N%N@(#) 82 1.30@(#)A@(#) 82 1.30@(#)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.

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 database 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 (OPERSEC) chosen, the access level is checked differently. If your NetView operator security is set to MINIMAL, NETVPW, or SAFPW, the user ID that is checked for hardware access is always the user ID that started the NetView address space, which is usually a STC user ID. This user ID 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 and RPC autotasks

- The autotasks defined with SYN %AOFOPXCFOPER% and %AOFOPRPCOPER% in automation table member AOFMSGSY
- The HW interface autotasks AUTHW*xxx*
- Any operator issuing a HW action with INGCF

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 a 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*.

Assign TCP/IP Port Authorization

When the physical file system is configured as INET, RACF can be used to restrict access to the ports that are used by I/O operations when using TCP/IP communication. For details about how to restrict access, see the section “Port access control” in “Chapter 3. Security” of *z/OS Communications Server: IP Configuration Guide*.

Access Authorization Levels

Table 21 on page 167 lists the I/O operations commands in alphabetical order with an indication of the access authorization levels they require and where they can be used.

Notes:

1. Access authorization is not required, although it is highly advisable.
2. The authorization level is not checked for I/O operations commands that are entered at the system console. The control level of authorization is assumed.
3. RACF profiles are defined in class FACILITY.
4. In Table 21 on page 167, the access authorization level that is required by the command can be:

   C Control
   R Read
   U Update
   UC Update for the **NOForce|NOCheck** options. Control for the **Force** option.

   The following indicate where the command can be used and what RACF authorization is required:

   G The function is generated implicitly, but RACF authorization, or equivalent, is required if I/O operations is used together with a security program.
   I A command function is generated implicitly as part of a G function. RACF authorization, or equivalent, does not apply.
   Y The command must be entered explicitly. RACF authorization is required.
   – The command is not available, either explicitly or implicitly.

Table 21. I/O Operations Commands, their Availability and Access Authorization Levels

RACF Profile Name	RACF Authorization Level	Application Programming Interface (API)	Switch Configuration Matrix (I/O Operations ISPF Dialog)	I/O Operations ISPF Dialog Command	System Console	Command
N/A	–	–	–	–	Y	System commands to start/stop
IHV.ALLOW	UC	Y	I	Y	Y	ALLOW
IHV.BLOCK	UC	Y	I	Y	Y	BLOCK
IHV.CHAIN	UC	Y	–	Y	Y	CHAIN
IHV.CHANGECHECK	R	Y	–	Y	Y	DISPLAY CHANGECHECK
IHV.CHP	R	Y	–	Y	Y	DISPLAY CHP
IHV.CONNECT	UC	Y	I	Y	Y	CONNECT
IHV.DELETE.FILE	C	Y	G	–	–	DELETE FILE
IHV.DEV	R	Y	–	Y	Y	DISPLAY DEV
IHV.DISCONNECT	UC	Y	I	Y	Y	DISCONNECT
IHV.GETLOCK	C	Y	–	Y	Y	GETLOCK
IHV.HOST	R	Y	–	Y	Y	DISPLAY HOST
IHV.LOGREC	C	Y	–	Y	Y	LOGREC
IHV.NAME	R	Y	I	Y	Y	DISPLAY NAME
IHV.PORT	R	Y	I	Y	Y	DISPLAY PORT
IHV.PROHIBIT	UC	Y	I	Y	Y	PROHIBIT
IHV.QUERY.ENTITY	R	Y	–	–	–	QUERY ENTITY
IHV.QUERY.FILE	R	Y	G	–	–	QUERY FILE
IHV.QUERY.INTERFACE	R	Y	–	–	–	QUERY INTERFACE
IHV.QUERY.RELATION	R	Y	–	–	–	QUERY RELATION
IHV.QUERY.SWITCH	R	Y	G	–	–	QUERY SWITCH
IHV.REMOVE.CHP	UC	Y	–	Y	Y	REMOVE CHP
IHV.REMOVE.DEV	UC	Y	–	Y	–	REMOVE DEV
IHV.REMOVE.SWITCH	UC	Y	–	Y	Y	REMOVE SWITCH
IHV.RESET.CHANGECHECK	C	Y	–	Y	Y	RESET CHANGECHECK
IHV.RESET.HOST	C	Y	–	Y	Y	RESET HOST
IHV.RESET.SWITCH	C	Y	–	Y	Y	RESET SWITCH
IHV.RESET.TIMEOUT	C	Y	–	Y	Y	RESET TIMEOUT
IHV.RESTORE.CHP	U	Y	–	Y	Y	RESTORE CHP
IHV.RESTORE.DEV	UC	Y	–	Y	–	RESTORE DEV
IHV.RESTORE.SWITCH	UC	Y	–	Y	Y	RESTORE SWITCH
IHV.RESULTS	R	Y	–	Y	Y	DISPLAY RESULTS
IHV.SWITCH	R	Y	I	Y	Y	DISPLAY SWITCH
IHV.SYNC.SWITCH	C	Y	–	Y	Y	SYNCH SWITCH
IHV.TIMEOUT	R	Y	–	Y	Y	DISPLAY TIMEOUT
IHV.UNBLOCK	UC	Y	I	Y	Y	UNBLOCK
IHV.UNCHAIN	UC	Y	–	Y	Y	UNCHAIN
IHV.UNLOCK	U	Y	–	Y	Y	UNLOCK
IHV.VARY	R	Y	–	Y	Y	DISPLAY VARY
IHV.WRITE	C	Y	I	Y	Y	WRITE
IHV.WRITEFILE	C	Y	G	–	–	WRITEFILE
IHV.WRITEPORT	UC	Y	–	–	–	WRITEPORT
IHV.WRITESWCH	UC	Y	G	–	–	WRITESWCH

Table 22 on page 168 lists the access authorization levels grouped by function (display, connectivity or utility).

Table 22. Access Authorization Levels Grouped by Function

RACF Profile Name	RACF Authorization Level	Application Programming Interface (API)	Switch Configuration Matrix (I/O Operations ISPF Dialog)	I/O Operations ISPF Dialog Command	System Console	Command
N/A	–	–	–	–	Y	System commands to start/stop
Display Commands						
IHV.CHANGECHECK	R	Y	–	Y	Y	DISPLAY CHANGECHECK
IHV.CHP	R	Y	–	Y	Y	DISPLAY CHP
IHV.DEV	R	Y	–	Y	Y	DISPLAY DEV
IHV.HOST	R	Y	–	Y	Y	DISPLAY HOST
IHV.NAME	R	Y	I	Y	Y	DISPLAY NAME
IHV.PORT	R	Y	I	Y	Y	DISPLAY PORT
IHV.RESULTS	R	Y	–	Y	Y	DISPLAY RESULTS
IHV.SWITCH	R	Y	I	Y	Y	DISPLAY SWITCH
IHV.TIMEOUT	R	Y	–	Y	Y	DISPLAY TIMEOUT
IHV.VARY	R	Y	–	Y	Y	DISPLAY VARY
IHV.QUERY.ENTITY	R	Y	–	–	–	QUERY ENTITY
IHV.QUERY.FILE	R	Y	G	–	–	QUERY FILE
IHV.QUERY.INTERFACE	R	Y	–	–	–	QUERY INTERFACE
IHV.QUERY.RELATION	R	Y	–	–	–	QUERY RELATION
IHV.QUERY.SWITCH	R	Y	G	–	–	QUERY SWITCH
Connectivity Commands						
IHV.ALLOW	UC	Y	I	Y	Y	ALLOW
IHV.PROHIBIT	UC	Y	I	Y	Y	PROHIBIT
IHV.BLOCK	UC	Y	I	Y	Y	BLOCK
IHV.UNBLOCK	UC	Y	I	Y	Y	UNBLOCK
IHV.CHAIN	UC	Y	–	Y	Y	CHAIN
IHV.UNCHAIN	UC	Y	–	Y	Y	UNCHAIN
IHV.CONNECT	UC	Y	I	Y	Y	CONNECT
IHV.DISCONNECT	UC	Y	I	Y	Y	DISCONNECT
IHV.REMOVE.CHP	UC	Y	–	Y	Y	REMOVE CHP
IHV.RESTORE.CHP	U	Y	–	Y	Y	RESTORE CHP
IHV.REMOVE.DEV	UC	Y	–	Y	–	REMOVE DEV
IHV.RESTORE.DEV	UC	Y	–	Y	–	RESTORE DEV
IHV.REMOVE.SWITCH	UC	Y	–	Y	Y	REMOVE SWITCH
IHV.RESTORE.SWITCH	UC	Y	–	Y	Y	RESTORE SWITCH
IHV.SYNC.SWITCH	C	Y	–	Y	Y	SYNCH SWITCH
IHV.WRITEPORT	UC	Y	–	–	–	WRITEPORT
IHV.WRITESWCH	UC	Y	G	–	–	WRITESWCH
Utility Commands						
IHV.DELETE.FILE	C	Y	G	–	–	DELETE FILE
IHV.WRITEFILE	C	Y	G	–	–	WRITEFILE
IHV.GETLOCK	C	Y	–	Y	Y	GETLOCK
IHV.UNLOCK	U	Y	–	Y	Y	UNLOCK

Table 22. Access Authorization Levels Grouped by Function (continued)

RACF Profile Name	RACF Authorization Level	Application Programming Interface (API)	Switch Configuration Matrix (I/O Operations ISPF Dialog)	I/O Operations ISPF Dialog Command	System Console	Command
IHV.LOGREC	C	Y	–	Y	Y	LOGREC
IHV.RESET.CHANGECHECK	C	Y	–	Y	Y	RESET CHANGECHECK
IHV.RESET.HOST	C	Y	–	Y	Y	RESET HOST
IHV.RESET.SWITCH	C	Y	–	Y	Y	RESET SWITCH
IHV.RESET.TIMEOUT	C	Y	–	Y	Y	RESET TIMEOUT
IHV.WRITE	C	Y	I	Y	Y	WRITE

Establishing Authorization with Network Security Program

If you have installed Network Security Program (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. 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

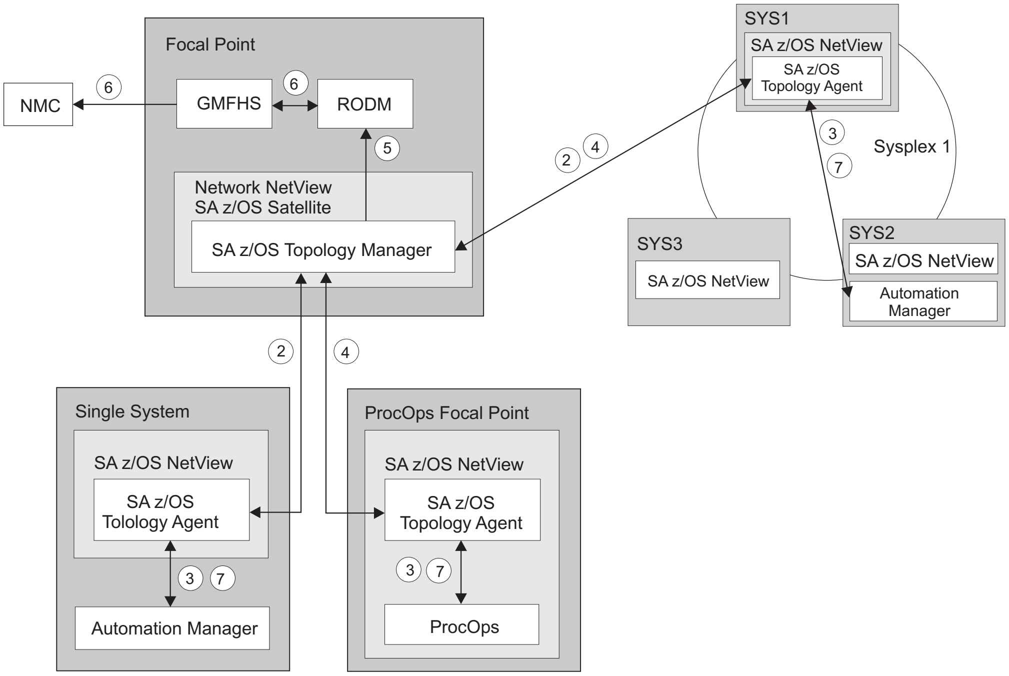


Figure 16. The SA z/OS Environment for NMC Support

Figure 16 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 about 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 139.

If you plan 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 18 on page 173. 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 26: Install an SA z/OS Satellite" on page 114 for details.

If you run the Networking Automation NetView only on the focal point, 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 17 on page 173 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.

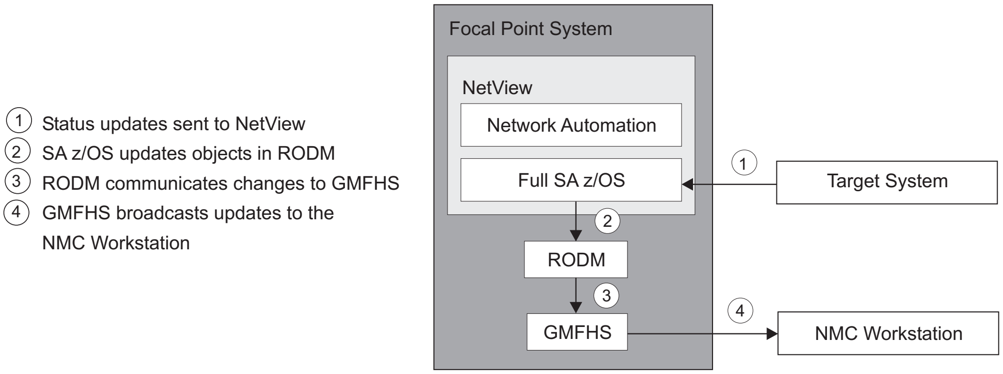

1 Status updates sent to NetView
2 SA z/OS updates objects in RODM
3 RODM communicates changes to GMFHS
4 GMFHS broadcasts updates to the NMC Workstation
Focal Point System
NetView
Network Automation
Full SA z/OS
RODM
GMFHS
1
2
3
4
Target System
NMC Workstation

Figure 17. SA z/OS Enterprise with Networking Automation and System Automation running on the same NetView

Figure 18 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 18.

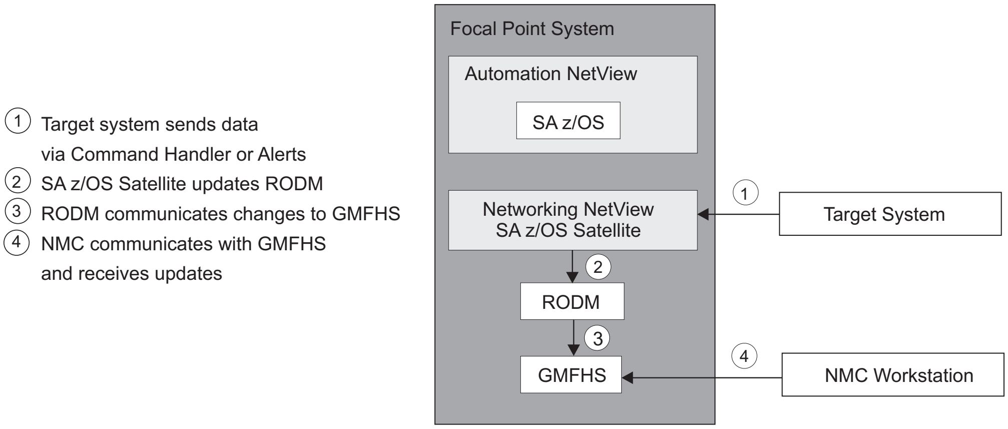

1 Target system sends data via Command Handler or Alerts
2 SA z/OS Satellite updates RODM
3 RODM communicates changes to GMFHS
4 NMC communicates with GMFHS and receives updates
Focal Point System
Automation NetView
SA z/OS
Networking NetView
SA z/OS Satellite
RODM
GMFHS
1
2
3
4
Target System
NMC Workstation

Figure 18. SA z/OS Enterprise Using a Networking NetView and an Automation NetView

Appendix C. 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:

```
                          ┌────────────────────────┐
                          ▼                        │
►►──SYSPLEX──sysplex_name───┬─────────┬─domain_id──┴─────────────────────►◄
                            └─net_id.─┘
```

The *sysplex_name* must be different from every name that you specify in a PROCOPS statement (see “The PROCOPS Statement” on page 176). 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 in 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.

Because standalone 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:

```
►►──PROCOPS──procops_name──focal_point──backup_focal_point──────────────────────►◄
```

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:

```
►►──LOCATION──target_domain──location_name──────────────────────────────────────►◄
```

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 in 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 installation.

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:

```
                                   ┌─────────────────────┐
                                   ▼                     │
►►──BLDVIEWS──┬─sysplex_name─┬────data_set_or_member─┴──────────────────────►◄
              └─procops_name─┘
```

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 in 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:

```
           ┌─PARENTS───┐
►►──OPTION─┤           ├─────────────────────────────────────────────────────►◄
           └─NOPARENTS─┘
```

```
           ┌─LINKMINOR───┐
►►──OPTION─┤             ├───────────────────────────────────────────────────►◄
           └─NOLINKMINOR─┘
```

```
           ┌─MDL_RADLINK─┐
►►──OPTION─┤             ├───────────────────────────────────────────────────►◄
           └─MDL_GRID────┘
```

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, 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), 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), 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, 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 184.

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, 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, 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:

```
►►──HBDELETE──┬─Y─┬──────────────────────────────────────────────►◄
              └─N─┘
```

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 in RODM. Specifying BASE or NONE makes processing faster, but at the cost of losing some NMC functionality. The syntax is:

```
►►──LINKTOVIEWS──resource──linkage───────────────────────────────►◄
```

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:

```
►►──MAPCOLOR──UNAVAILABLE──┬─user positive value─┬─────────────────────────────►◄
                           └─user negative value─┘
```

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 **DisplayStatus** field 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.

SA z/OS expects that the RODM and GMFHS defaults put the 'UserNegative' values into exception views. 'UserPositive' values are assumed not to appear in exception views.

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 D. 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 26: Install an SA z/OS Satellite” on page 114.

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 23. 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 in 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 in RODM. Finally it will run the BLDVIEWS statements that you have defined for each sysplex. These will create views in 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

This section describes how to set up extended multiple console support (EMCS) and also describes its restrictions and limitations.

Note: EMCS support is mandatory for the successful operation of SA z/OS.

Setting Up EMCS

- 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.

EMCS Restrictions and Limitations

- 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 an SAF OPERPARM definition for extended MCS console authority to anything other than MASTER

Violation of these restrictions will cause unpredictable results.

Appendix E. Using the HW Integrated Console of System z for External Automation with SA z/OS

The HW Integrated Console provides a message and command interface for operating system images running on System z hardware to cover system initialization, recovery situations, or emergency operator tasks.

Especially when channel-attached or otherwise-connected 3270/ASCII operator console devices are not configured or cannot be used with the System z processor hardware, the integrated console is the only console interface for an operating system at initialization time.

For the SA z/OS processor HW interfaces, the integrated console is the exclusive facility to communicate with the target operating systems running on System z processors. Other console interfaces that become available after target OS initialization is complete are not used. With the SA z/OS HW interfaces, you can control and automate System z processors externally. This means the controlling SA z/OS program can run on a different processor or LPAR than the target system to be controlled. One typical example is to monitor or automate the IPL prompts of a remote system displayed on its integrated console.

This appendix provides background, usage, and performance information important to know if you plan to use the HW integrated console support (CI) of the SA z/OS processor hardware interfaces for your automation. The System z hardware commands, like SYSRESET, LOAD for example, are not discussed in this chapter. For more information about automating these commands, refer to *IBM Tivoli System Automation for z/OS Operator's Commands* and *IBM Tivoli System Automation for z/OS User's Guide*. However the automation interface and remote configuration information in this chapter is valid for both HW commands and CI automation. This appendix includes the following sections:

- "CI Usage in IBM Tivoli System Automation Products" on page 192
- "CI Protocols and Automation Interfaces" on page 192
- "CI Configuration for Remote Automation" on page 193
- "CI Automation Basics" on page 195
- "CI Differences to 3270-Based Console Devices" on page 196
- "CI Performance Factors" on page 196
- "Network Dependencies" on page 197
- "IP Stack Considerations" on page 197
- "ProcOps SNMP Sessions" on page 197
- "OS Message Format Support with ProcOps/BCPii" on page 197
- "Automating Multi-Line z/OS Messages" on page 198
- "Limiting the Number of z/OS IPL Messages Displayed on CI" on page 198
- "Recommended z/OS Console Settings for CI Usage with SA z/OS" on page 198
- "Using CI in a z/OS Sysplex Environment" on page 199
- "Running with the z/OS System Console Deactivated" on page 199
- "z/OS Health Checker Considerations" on page 199
- "CI Security with SA z/OS" on page 200

- "Testing CI Performance for SNMP Connections" on page 200
- "Summary: Managing CI Performance for SA z/OS" on page 201

CI Usage in IBM Tivoli System Automation Products

SA z/OS Processor Operations (ProcOps)

Processor operations is a NetView and SNMP-TCP/IP protocol-based automation interface and API to monitor and control System z mainframes. ProcOps is a focal point application that allows external mainframe automation. See the ProcOps API command ISQSEND in as an example of a ProcOps command using CI. The integrated IPL automation for z/OS and z/VM are other examples of using CI. With ProcOps, CI messages are sent automatically to the focal point system as soon as the network connection is established to the Support Element (SE) or Hardware Management Console (HMC) and the targeted system (LPAR) is registered. The ProcOps API command ISQXIII is used to perform these steps.

System Automation for Integrated Operations Management

System Automation for Integrated Operations Management (SA IOM) is a client server product for the Windows platform that provides SNMP-TCP/IP protocol-based REXX automation sample scripts to monitor and control System z mainframes, including the monitoring of CI messages from the HMC. Refer to the *System Automation for Integrated Operations Management User's Guide* for more information.

With SA IOM, the SNMP Agent of the HMC that is to be used for the System z HW access must be customized to send operating system message event SNMP traps to the IP address of the SA IOM server. This ensures that the CI messages are available for the automation scripts running on the SA IOM server.

Related Information

The IBM Service Offering GDPS (Geographically Dispersed Parallel Sysplex, an IBM disaster recovery solution for System z mainframes), requires NetView and SA z/OS to be active. It uses the CI facility with the internal services of SA z/OS. Refer to the *GDPS/PPRC Installation and Customization Guide* for more information. An example of CI exploitation of GDPS is DUPLICATE VOLSER automation at IPL time.

Depending on the function performed, CI message registration or deregistration is controlled internally by the GDPS code.

CI Protocols and Automation Interfaces

In order to use the HW integrated console (CI), the SA z/OS program uses two communication protocols. These protocols use the System z application programming interfaces. You use Option 10 (Processors) on the Entry Type Selection panel of the SA z/OS customization dialog to configure the communication protocols for a processor. See *IBM Tivoli System Automation for z/OS Defining Automation Policy* for more information.

INTERNAL (BCPii Base Control Program Internal Interface)

This protocol is based on a System z internal communication service (SCLP) between the LPARs and the processor support element (SE) to perform HW operations and configuration management tasks. No network IP stack is needed.

See “Planning the Hardware Interfaces” on page 18 for more information. The scope of processors that can be controlled with this protocol is the HW LAN.

SNMP

This protocol requires a Internet Protocol network stack. From a ProcOps focal point system, which must be connected to a business LAN, you can monitor and control processors and operating system messages (CI) from LPARs running on the controlled processors. Network access from the business LAN to the HW LANs of the processors is required. ProcOps supports SNMP connections to HMCs and SEs.

System z Application Programming Interface

The API covers all network-specific programming services (Bind, Connect, and so on) and allows applications to concentrate on HW function and event control. The API uses the SNMP MIB data format. Applications using the API can dynamically register for events, such as operating system messages, from the CI of a particular LPAR.

For detailed information, refer to *System z Application Programming Interfaces*, which is available under your HMC’s **Books View** or on IBM Resource Link® for download. The document also contains information about how to download the API itself for various OS platforms and Java. This generally available API version supports the TCP/IP SNMP protocol.

A special version of the API is distributed with the SA z/OS that supports the BCPii and the TCP/IP protocol. This version can only be used together with SA z/OS.

Related Information

With z/OS V1R11, BCPii can also be used independently of SA z/OS or GDPS by applications that are written in high-level languages to automate CI operations. See *z/OS MVS Programming: Callable Services for High-Level Languages* for more information. For this BCPii implementation, a special version of the System z API code is provided with the services.

Regardless of the System z APIs, you can write an SNMP manager application to process operating system message (CI) SNMP traps from an HMC or a SE. However, without using the API, you must register your application permanently with the SNMP agent to receive the SNMP trap data. You must perform this SE/HMC customization step manually.

The System z HMC can be configured to act as a Common Information Model (CIM) server. CIM client applications can be written to receive CI messages using the IBMZ_OSMessage CIM class. See *System z Common Information Model (CIM) Management Interface*, which is available on your HMC, if you need more information.

CI Configuration for Remote Automation

Figure 19 on page 194 illustrates how the CI of three systems is connected to an SA z/OS system, which is acting as a remote automation focal point.

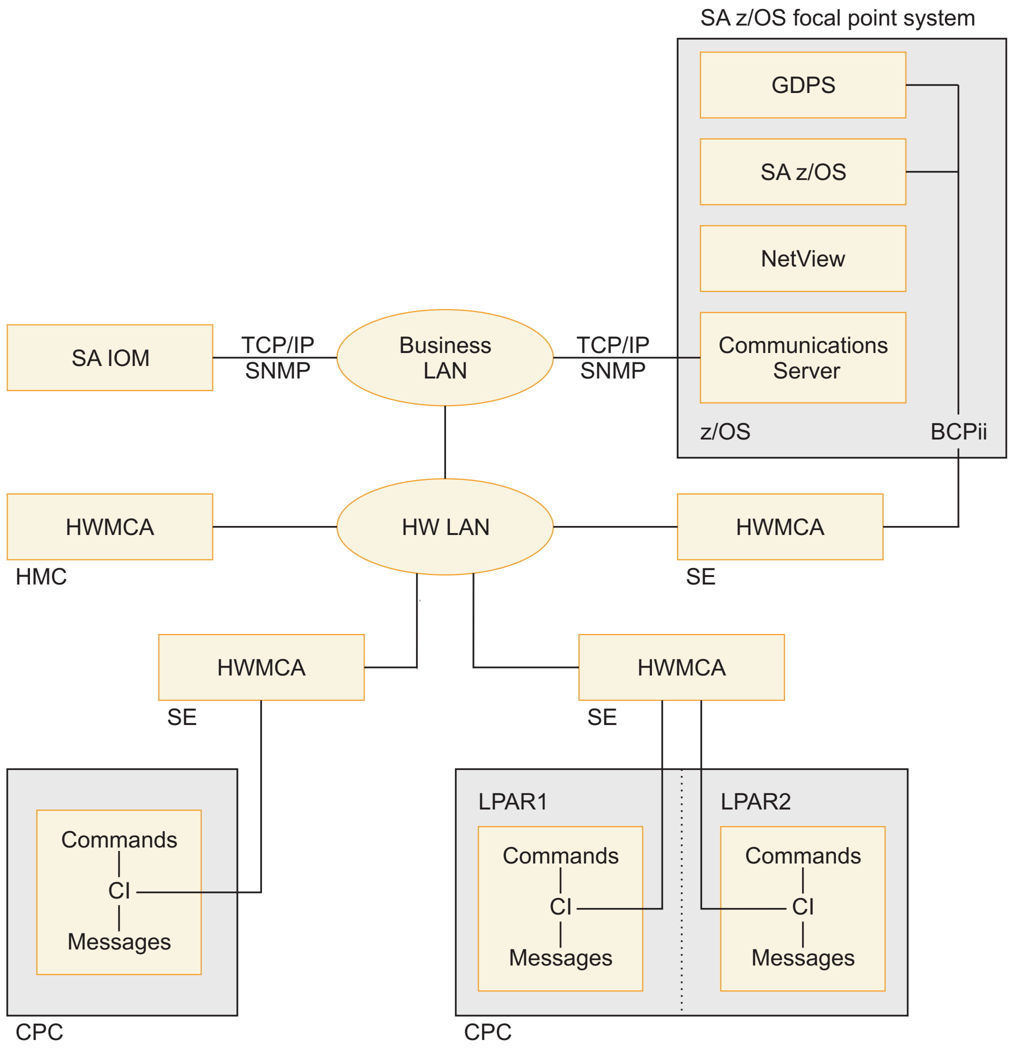


Figure 19. Remote Operations Components for System z. Not all interfaces or communications links are shown.

SA IOM and SA z/OS ProcOps use the TCP/IP connections that are always from a focal point (SA IOM Server, ProcOps FP System) to target processors and systems. The SA z/OS BCPii (INTERNAL) is a peer connection protocol. In a system cluster like a z/OS Parallel Sysplex, all participating systems can be configured in the SA z/OS policy to have BCPii connections with one another.

Focal points can be located close to the systems they control or located remotely from them. For the TCP/IP SNMP protocol that is used by SA z/OS this can be a Business LAN or Intranet, or a global Internet distance. For the BCPii (INTERNAL) protocol the distance between two BCPii connected systems depends on the dimension of the HW LAN.

With GDPS in a Parallel Sysplex environment, the distances between BCPii-connected systems is also affected by the connectivity requirements of the Coupling Links. Refer to the IBM Redbooks® publication, *System z Connectivity Handbook* and the available GDPS documentation for more information.

How the HW LAN is connected to the Business LAN depends on the security policies that apply. Router/Bridge hardware and firewall software are typically used to control access. For more information refer to the *Installation Manual for Physical Planning* and *System Overview* manuals that are available for your System z mainframe.

The Hardware Management Console Application (HWMCA) is a licensed software application that is installed on the Hardware Management Console and the Support Element (SE). It provides the GUI and the interfaces for automation software. BCPii connections and TCP/IP SNMP connections use the HWMCA.

SA z/OS ProcOps runs as a NetView application and uses a Communications Server TCP/IP stack to communicate with an SE or HMC. In Figure 19 on page 194, the HMC is attached to the HW LAN of the mainframes, however configurations with HMCs that are attached to the Business customer LAN are also supported. Support Elements must be attached to an HW LAN. CI message events and commands are exchanged between the connection end points of the SE or HMC and the SA z/OS ProcOps application.

The SA IOM server workstation is attached to the Business LAN. CI message events and commands are exchanged between the connection end points of the HMC and the SA IOM application on the server. The HMC receives the CI message events from all CPCs and images (LPARs) that have been defined for it.

GDPS, which runs as a NetView application, uses SA z/OS internal services to communicate with the Support Elements over the BCPii. The BCPii protocol itself uses the z/OS support processor interface services (SCLP) to do this. If a GDPS BCPii request targets an SE other than the local one, the HMC is used to route the request to the target.

In Figure 19 on page 194, the CI of three target systems is shown. One CPC has two logical partitions, LPAR1 and LPAR2, each with a CI. The third CI is shown for a single system that is running on another CPC. Together with the CPC of the focal point system, all the CPCs are connected to the same HW LAN.

Although not shown in Figure 19 on page 194, a fourth CI, that of the focal point system itself, can also be automated. Both of the TCP/IP SNMP and BCPii protocols can be used to do this.

CI Automation Basics

The CI facility uses a physical (cable) connection between the processor HW (CPC) and the attached processor support element (SE) unit. With the CI, the message and command information is exchanged between a system image running on the CPC and its SE.

For automated operations, CI has an interface to the console application (HWMCA), running on each SE or HMC. If there is a ProcOps session to a HMC/SE, or a GDPS session to a SE, the console application generates an event for each new CI message. This event is sent to all registered applications (ProcOps, GDPS), using the transport protocol configured in SA z/OS. This is SNMP for ProcOps or INTERNAL (BCPii) for GDPS.

Automation applications can send operating system console commands to a CI for execution. With SA z/OS this can happen either in response to messages that are received only over CI, or independent of that at any time. The only requirement is that a SA z/OS HW session exists between the SE/HMC and the automation application (SA z/OS/ProcOps or GDPS). The advantage for automation of using the CI is that there is no 3270-specific information and screen formatting burden. This makes the interface robust and easier to use for automation purposes than 3270 console screen emulation and interpretation.

Related Information

The Support Element (SE) provides the GUI for local CPC operation. It is connected to a processor HW LAN, together with SEs from other CPCs that may use this HWLAN. As the next higher systems management level, Hardware Management Consoles (HMCs) can be connected to the processor HW LAN. Within an HW LAN, an HMC represents a single point of control for the CPC objects defined to it. HMC users can log in directly at the console, or they can use its Web interfaces to log in. In an HW LAN environment, multiple HMCs can coexist, either sharing or splitting the control of the CPCs attached to it.

With an HMC, the normal manual CI operation is done by using the Operating System Messages task. One or multiple image objects (LPARs) can be selected, which can be located on different CPC objects. Each selected LPAR allows the use of its integrated console by clicking the desktop message window tab of this LPAR. This allows the operator to view the individual message streams and to send commands to the operating system running in this LPAR. For more information refer to the Hardware Management Operations Guide of your processor.

Manual CI operation of the SE is possible, by either accessing the SE unit located in the CPC cage, or by using the Single Object Operation Task from an HMC to control the SE remotely. These methods however are not considered to be for normal operations. They are used for CPC/SE configuration tasks or for service. For more information refer to the Support Element Operations Guide of your processor.

CI Differences to 3270-Based Console Devices

Compared to 3270 display devices, CI does not provide 3270 data stream related features such as extended color or program function key support. In case of a SE outage, the CI for all CPC LPARs is affected. The CI becomes available again, once an alternate SE is activated as the primary, or the primary SE is reactivated. In a channel-attached 3270 operator console environment, failing consoles can be backed up by using multiple operator consoles over different channel paths.

CI Performance Factors

The CPC's microcode must handle the CI message requests from all its LPARs concurrently. Depending on the number of LPARs and the number of messages that are sent by each operating system over CI, upcoming workload peaks can influence the overall CI performance. This also applies to a SE/HMC, when a varying number of applications have to be serviced, by sending a varying number of CI message events. On the SE side, CI is lower in priority than time-critical SE tasks such as power and thermal management, and when the SE is busy with those tasks, CI an be slowed down. the activation of an LPAR can affect the CI performance of adjacent LPARs on the same CPC. See also “Testing CI Performance for SNMP Connections” on page 200.

Network Dependencies

CI-based automation with ProcOps depends on the availability of a Internet Protocol network infrastructure. The connection between the SE/HMC and a SA z/OS ProcOps FP system requires this. If a network element, such as the IP stack on the ProcOps FP system, is not available, CI-based automation cannot work. This also applies if LAN routers or bridges that are used to interconnect the CPC HW LAN with the customer Business LAN have configuration or connection problems, or fail.

For CI over BCPii connections, the following dependencies apply:

As long as all participating system images are running on the same CPC, no external network elements are involved. For SA z/OS managed systems, located on different CPCs of a CPC HW LAN, at least one HMC is involved as network element for internal routing purposes. The routing HMC and the routing mechanism are transparent to the BCPii protocol. If multiple HMCs in a CPC HW LAN are configured for routing, each of them can potentially be used for that purpose.

IP Stack Considerations

The SA z/OS ProcOps SNMP (TCP/IP) transport requires an IP stack to be active on the ProcOps FP system. The BCPii transport does not have this requirement. SA z/OS ProcOps supports multiple IP stacks on the FP system on a SE/HMC connection level. You can therefore predefine the IP stack to be used for a specific SE/HMC connection with the SA z/OS customization dialog. If you do not define an IP stack name, the system default stack is used.

Adjusting the Receive Buffer size of the ProcOps FP IP stack is an efficient way to prevent CI events from getting lost. See “ProcOps SNMP Sessions” for more details about lost events. SA z/OS ProcOps uses the Receive Buffer size value that is specified in the configuration file of the IP stack. With a larger Receive Buffer size, more CI event data can be queued to the ProcOps FP system IP stack before a Receive Buffer full condition occurs and a negative response must be returned to the SE/HMC.

ProcOps SNMP Sessions

When an SNMP (TCP/IP) connection is established to a SE/HMC, ProcOps uses the session parameter: HWMCA_TOLERATE_LOST_EVENTS. This setting makes sure that a session is not terminated by the console application (HWMCA) if the IP stack of the SE/HMC can no longer send events (CI or others) due to a negative send response returned from the ProcOps FP IP stack. In this case the event is discarded, but the session remains operational. Without this parameter, the session would terminate, the events would be discarded, and the session would have to be restarted. For more information about the session parameters refer to *System z Application Programming Interfaces*.

OS Message Format Support with ProcOps/BCPii

With SA z/OS, the CI message ID and message text are the only supported parts of an OS message in ProcOps/BCPii. Available CI attributes, like date and time or system names which can prefix a message line, are not supported. They may however be present in the CI window of the HMC. Similarly, display attributes, such as held message, priority message, prompt indicators or audible alarm indicators, are ignored when the OS message event data is collected by SA z/OS. The unsupported CI message attributes; date, time, system name and unsupported display attributes; held message, priority message, and the audible alarm may be OS-specific. The common CI format of the operating system environments identified by the SA z/OS hardware interfaces apply to: z/OS, z/VM, z/VSE, z/TPF, Linux on System z, Coupling Facility Control Code (CFCC), and stand-alone utilities such as SADUMP or the Device Support Facility ICKDSF.

Automating Multi-Line z/OS Messages

Care must be taken when automating z/OS multi-line messages, displayed on CI. Internal z/OS message attributes which identify the different parts of a multi-line message are not available with CI; it can be difficult to identify them explicitly. Parts of a multi-line message are: Header line, one or more Data lines, and End of message line. With the internal message data format of a multi-line message, available over the z/OS subsystem interface (SSI), you can explicitly access these multi-line message parts. ProcOps/BCPii connections to the HMC/SE are always external connections which cannot register to the z/OS SSI. With ProcOps/BCPii CI multi-line messages are only made available as a number of single message lines in the order that they are displayed on CI.

Limiting the Number of z/OS IPL Messages Displayed on CI

As part of the z/OS Load parameter specification, the initialization message suppression indicator (IMSI) can be chosen to control the suppression of messages and system prompts during initialization. The IMSI character tells the system whether to perform the following actions during system initialization:

- Display most informational messages
- Prompt for system parameters
- Prompt for the name of the master catalog

See the section “Loading the System Software” in *z/OS MVS System Commands* for a table that shows the possible values for the IMSI character. The values indicate all possible combinations of the actions that are listed.

Whenever possible, it is recommended that you suppress the display of informational messages to reduce the total number of messages at IPL time. If you plan for z/OS IPL automation do not use informational messages as automation action triggers. Choose only messages that cannot be suppressed, in addition to action or decision operator prompts.

Recommended z/OS Console Settings for CI Usage with SA z/OS

Although not a 3270 console device, z/OS supports certain console characteristics for this facility. In the z/OS literature it is referred to as a system console. Because the system console is a special facility, z/OS allows you to activate and to deactivate its usage. This is done with the z/OS console commands V CN(*),ACTIVATE and V CN(*),DEACTIVATE, entered at the HMC or by automation software.

Once activated, z/OS calls this ‘the console is in Problem Determination mode’. Operators or automation software can use it to get command responses and unsolicited messages. The amount of unsolicited messages sent to the z/OS system console (CI) can be controlled by setting its z/OS routing codes.

You can specify the AUTOACT group keyword in the CONSOL*xx* member of the PARMLIB. With an AUTOACT group, the ACTIVATE, DEACTIVATE of the system console can be done automatically.

If you have automation routines to issue commands on the CI after IPL is complete, make sure that the allowed routing codes for the system console are limited. Issue command V CN(*),ROUT=NONE on the CI to achieve this. This setting makes sure that you receive only the command responses, job start/stop information, and z/OS priority messages. For more information about system console (CI) and AUTOACT usage refer to *z/OS MVS Planning: Operations*.

Using CI in a z/OS Sysplex Environment

In a sysplex environment you can set the message scope for the system console to cover multiple or all systems of the sysplex. Do not do this if you use SA z/OS ProcOps or GDPS to monitor and control the systems. The scope must be limited to the system, to which the system console is attached.

The z/OS ROUTE command allows you to forward operator commands from the System Console (CI) of one system in a Sysplex to another system in the same Sysplex for execution. The command response is then returned to the System Console where the ROUTE command was entered. In a SA z/OS environment, do not use the ROUTE command in your CI communication-based automation. Instead, you should establish a connection to the CI of each system and address each target system directly.

The reason for this restriction is the fact that the SA z/OS HW interface automatically prefixes CI messages with the processor (dot) LPAR name of the CI, where the message is displayed. For a ROUTE command response, however, this may not be the system location where the response came from.

Running with the z/OS System Console Deactivated

In deactivated mode, the z/OS System Console (CI) does not allow you to issue regular operator commands. Unsolicited z/OS messages are not displayed, with exception of z/OS priority messages. In addition you can:

- Send a message to the System Console from TSO or another z/OS consoles (MCS/SMCS/EMCS), using the system console's z/OS console name as destination,
- Respond to pending system requests (reply numbers). Care must be taken when doing this because no response messages are displayed. In deactivated mode you can also not issue a z/OS D R command to determine the pending requests.

z/OS Health Checker Considerations

The Health Checker MVS component allows monitoring of certain active settings for the System Console (CI) and to issue exception notification messages if they deviate from predefined best practices settings. Together with many other checks of the system environment the z/OS Health Checker can help to recognize potential system problems or even to prevent system outages.

If you have z/OS system images controlled remotely with the SA z/OS W interfaces and you have their System Consoles (CI) running in PD mode, you have to decide if this is really considered to be an exception in case the IBMCNZ Syscons checking is active. For more information about Health Checking refer to *IBM Health Checker for z/OS: User's Guide*.

CI Security with SA z/OS

You can control the usage of CI with SA z/OS by restricting the user access to the processors hardware and LPARs. SA z/OS users without the required permission are not able to issue HW interface commands either directly with ProcOps or indirectly using a GDPS command which issues HW interface commands internally. For more information see "Controlling Access to the Processor Hardware Functions" on page 160.

Note: Regardless of restricting the CI access with SA z/OS, some operating systems that use CI as a console facility restrict console usage by requesting an operator to log in first. If you perform such a login with SA z/OS, for example using the ProcOps ISQSEND API command, password information is not protected.

Testing CI Performance for SNMP Connections

Sending a specified number of predefined (pattern) messages to the integrated console using a message per second rate of your choice is the basic logic to determine the overall CI message throughput and performance of a SA z/OS SNMP connection to a SE or HMC.

Once the messages arrive at the ProcOps FP system, they are written to the NetView log. You can determine if OS message events are lost by controlling the message sequence numbers.

In the example shown in Figure 20, the ISQ999I message sequence number is 00004. The test case was started for a total of 00010 messages. In the ProcOps FP Netlog you should find all messages from 00001 to 00010. If one or more messages are missing, this indicates that message events were lost on the connection.

```
         1         2         3         4         5         6
----+----0----+----0----+----0----+----0----+----0----+----0----+

+ISQ999I 12:24:01 Test Message 00004 of 00010 *** 1234567890$%&/(


    7         8         9        10        11        12
----0----+----0----+----0----+----0----+----0----+----0

)=? qwertzuiop_QWERTZUIOP* _ProcOps-SYSCONS_ asdfgh+120
```

Figure 20. ISQ999I Test Message Pattern Example

Two REXX program utilities, ISQWTO3 and ISQTSND3 are delivered with the SA z/OS sample library SINGSAMP as members INGEI005 and INGEI006.

Both programs require specifying the total number of messages to be produced on the integrated console (CI) per call. The second parameter can be used to specify the message per second rate that the utility should try to achieve. For installation and usage information refer to the utility source members in the SINGSAMP library.

ISQWTO3 is the utility implementation for NetView environments; ISQTSND3 is a TSO implementation, if a NetView/SA z/OS environment is not available on the z/OS system to be tested.

Run the programs with different combinations of total message numbers and message per second rates. This allows you to emulate different CI message load situations.

Warning!: The usage of these utilities can produce many messages in the system log of the targeted system and the NetView log of the ProcOps FP system.

Summary: Managing CI Performance for SA z/OS

Bear in mind the following recommendations:

1. Follow the recommendations in this chapter to reduce the number of CI messages.
2. If possible, do not use CI alone to monitor the control a system completely. Limit its usage to system initialization and recovery situations.
3. Avoid issuing commands over the CI that may return a large amount of output.
4. For SNMP connections, consider using separate IP stacks with tailored Receive Buffer sizes to cover lost message event situations.
5. Use the ISQWTO3 and ISQTSND3 utilities from the SA z/OS sample library to test peak message load situations and how they affect CI performance.

Appendix F. Migration Information

This appendix provides information about migrating to SA z/OS 3.4 from SA z/OS 3.3 or SA z/OS 3.2. The actions that are required depend on which release you are migrating from.

Migration Steps to SA z/OS 3.4

Complete the following steps to migrate to SA z/OS 3.4:

Step 1. Install the compatibility APAR OA37376 (SA z/OS 3.2, and SA z/OS 3.3) before migrating to SA z/OS 3.4. Open the customization dialog before converting to a SA z/OS 3.4 policy database in step 2. This APAR also enables you to use a SA z/OS 3.4-built configuration file on a system running SA z/OS 3.2 or SA z/OS 3.3 in a mixed environment.

Step 2. Make a copy of your V3.n policy database and edit it with the SA z/OS 3.4 customization dialog. This converts it to a V3.4 policy database. For more information, see "Conversion Function" in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Step 3. Before migrating to SA z/OS 3.4 read through the following sections:

- If you are migrating from SA z/OS 3.2, “Migration Notes and Advice when Migrating from SA z/OS 3.2” on page 205.
- If you are migrating from SA z/OS 3.3, “Migration Notes and Advice when Migrating to SA z/OS 3.4.”

Step 4. Build the configuration files from the policy database. For more information, see "Building and Distributing Configuration Files" in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Step 5. Load the build files on the designated system. For the first load of the new and converted build files a NetView recycle is required. For more information, see “Step 18B: Distribute System Operations Configuration Files” on page 104 and the Chapter "Building and Distributing Configuration Files" in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Migration Notes and Advice when Migrating to SA z/OS 3.4

This section contains details of various aspects of migration that you should be aware of. Make sure that you read through this section before migrating to SA z/OS 3.4:

- Post SMP/E Steps
- Miscellaneous

Post SMP/E Steps

You must review the following standard installation steps and, if necessary, carry them out:

1. “Step 4A: Update IEAAPF*xx*” on page 59
2. “Step 4B: Update SCHED*xx*” on page 60
3. “Step 4D: Update LPALST*xx*” on page 61
4. “Step 4E: Update LNKLST*xx*” on page 61
5. “Step 5: Customize SYS1.PROCLIB Members” on page 63

6. “Step 6F: Add the INGRXFPG REXX Function Package” on page 72
7. “Step 10B: Customizing HSAPRM*xx*” on page 89
8. “Step 13A: Allocate Libraries for the Dialogs” on page 93
9. “Step 17: Compile SA z/OS REXX Procedures” on page 102 (if necessary)
10. “Step 23: Check for Required IPL” on page 111
11. “Step 35: Customizing I/O Operations” on page 135 (if you need to specify communication via IP)

Miscellaneous

- The Inactive Monitor Health status is no longer available for the INGMON command. Clean up any PDB or Automation Table entries that have an entry INGMON STATUS=INACTIVE. Conversion will remove the INACTIVE status in all cases where INACTIVE was selected by the MESSAGES/USER DATA policy (line command AS).
- New columns are added and the order of columns is changed for the command DISPGW.
- The IMS State/Action Tables (ISA) Entry Type has been withdrawn from the Product Automation Entry Type.
- The Timeout Settings Entry Type (TMO) has been withdrawn. This entry type defined the NetView globals: WAITTIME, XDOMTIME and up to 4 user globals in the form xxxxTIME together with specific timeout values. These definitions can also be done in the NetView member CNMSTYLE.
- Message variables are now shown in mixed case where applicable. The consequence for the DISPACF command is that data is displayed as entered in the original policy.
- The INGLIST command linemode has a new layout starting with the "Health" column. It is recommended to use the INGDATA command in automation scripts.
- When running in a mixed environment, install compatability APAR OA37376 (prerequisite is other known compatability APARs OA34478 and OA33659).
- SDF Statuses APGG, APGY, APGB, and APGR are obsolete and replaced by APG_OK, APG_ERR, AOG_DOWN and APG_DOWN.
- Beginning with V3.4 message variables are shown in mixed case where applicable. The consequence is that the DISPACF command shows the data as specified in the policy.
- The default type of APG changed from SYSPLEX to SYSTEM. Clients who use 'update via file' to create new APGs of type SYSPLEX need to define explicitly the APG Type to SYSPLEX in the 'NEW APG' block.
- The Batch command receiver has been enhanced to enable concurrent usage of the command receiver. Commands submitted from batch jobs may be processed in parallel. For more information, refer to the chapter "Command Receivers" in *IBM Tivoli System Automation for z/OS Customizing and Programming*. The REXX module EVJRYCMD was added as AOFRYCMD to the ING.SINGTREX library. For migration purposes, EVJRYCMD also resides in ING.SINGNREX library. It is recommended to use AOFRYCMD in the future and to adapt the automation environment accordingly.
- Specific messages for SDF are now added with the prefix AOFS. Some AOF-prefixed messages are now withdrawn and replaced. Refer to “Status Display Facility (SDF) Message Set” on page 9 for a full illustration of message changes from prefix AOF to AOFS.

- The 'Automation Name' for APGs is set to the APG's entry name by default. The automation name was undefined before. If you used the option 'Update via file' to create new APGs with a defaulted 'Automation Name', you now need to set explicitly 'Automation Name' to blank in the 'NEW APG' block. If this is not done, the APG may build a resource that is visible to operators.
- The name of the subsystem interface router task is set to the default NetView name CNMCSSIR. When using NetView 6.1 it cannot be adapted any longer. If you are not using NetView 6.1 then you still have the option to set the SSINAME in the NetView stylesheet according to your needs. There is no need to adapt the SSIname in AOFMSGSY any longer.
- The TSO REXX function package INGTXFPG has been introduced. For full details, please refer to “Step 15: Install Function Packages for NetView and TSO” on page 98.
- The default for the ALL2CONS parameter of the DISPSTAT command changed from NO to YES. The offset layout of DISPSTAT in line mode has changed for this release.

Migration Steps to SA z/OS 3.3

Complete the following steps to migrate to SA z/OS 3.3:

Step 1. Install the compatibility APAR OA31270 (SA z/OS 3.1 and 3.2) before migrating to SA z/OS 3.3. Open the customization dialog before converting to a SA z/OS 3.3 policy database in step 2. This APAR also enables you to use a SA z/OS 3.3-built configuration on a system running SA z/OS 3.1 or SA z/OS 3.2 in a mixed environment.

Step 2. Make a copy of your V3.*n* policy database and edit it with the SA z/OS 3.3 customization dialog. This converts it to a V3.3 policy database. For more information, see the chapter “Conversion Function” in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Step 3. Before migrating to SA z/OS 3.3, read through the following section:

- If you are migrating from SA z/OS 3.2, “Migration Notes and Advice when Migrating from SA z/OS 3.2”

Step 4. Build the configuration files from the policy database. For more information, see the chapter “Building and Distributing Configuration Files” in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Step 5. Load the build files on the designated system. For the first load of the new and converted build files, a NetView recycle is required. For more information, see “Step 18B: Distribute System Operations Configuration Files” on page 104 and “Chapter 8. Building and Distributing Configuration Files” in *IBM Tivoli System Automation for z/OS Defining Automation Policy*.

Migration Notes and Advice when Migrating from SA z/OS 3.2

This section contains details of various aspects of migration that you should be aware of. Make sure that you read through this section before migrating to SA z/OS 3.3. It contains the following:

- “Event Notification Service” on page 206
- “CICS-to-DB2 and IMS-to-DB2 Connection Monitoring” on page 206
- “DB2 Cleanup” on page 207
- “IMS Automation Migration” on page 209
- “ProcOps Control File Replacement” on page 209

- “Automation Policy Considerations” on page 209
- “Miscellaneous” on page 212
- “Equivalents to Retired Commands” on page 212

See also Appendix G, “CICS Automation Migration from SA z/OS 3.2,” on page 215.

Event Notification Service

The replacement of the TEC notification service with the event notification service requires the following migration steps:

1. Remove the specified automation table, INGMTEC, from the System Information policy item.
2. Remove the defined automation task, AUTOTEC, in the Automation Operator Definitions policy item.
3. Replace the message format file as described in “Configuring the NetView Message Adapter Service” on page 101.
4. Follow the implementation instructions for the new event notification service, as described in “Installing and Customizing the TEC Event Server Workstation” on page 145.

CICS-to-DB2 and IMS-to-DB2 Connection Monitoring

The text of messages ING101A and ING102I has been changed.

In SA z/OS 3.2, the monitoring of CICS-to-DB2 and IMS-to-DB2 connections was done by the routine INGRDCNM, which was called from the automation table and by NetView timers.

SA z/OS 3.3 allows the monitoring of these kinds of connections with monitor resources. Monitor commands are provided that can be used by the monitor resource to analyze the status of the connections and to update the health status depending on the monitor results.

Migration Steps

What to do	When
Step 1. Define a monitor resource for each CICS DB2 and IMS DB2 connection that is to be monitored, including appropriate relationships. For details, see "Monitoring of CICS DB2 Connections" and "Monitoring of IMS DB2 Connections" in *System Automation for z/OS. Product Automation Programmer's Reference and Operator's Guide*. Step 2. Clean up the automation policy definitions for the current connection monitoring implementation: a. Remove the definition of command INGRDCNM for the message ID ACORESTART of DB2 subsystems. b. Remove automation flag definitions for the minor resources CONN and CONN.*connection_id* of DB2 subsystems. c. Remove command and code definitions for the message ID CONN of DB2 subsystems.	On an SA z/OS 3.1 agent the currently implemented connection monitoring via the INGRDCNM routine is available, even when using a SA z/OS 3.3 automation policy. On an SA z/OS 3.2 agent, once the automatically-built automation table of SA z/OS 3.3 is used, connection monitoring with the INGRDCNM routine is no longer available and you must perform the steps that are described in "Migration Steps." In SA z/OS 3.3 the INGRDCNM routine is no longer available.

DB2 Cleanup

INGDB2 no longer supports the START request for the DB2 start in maintenance mode. Use flexible start type definitions instead. For details see the *DB2 best practice policy.

The return codes of the INGDB2 utility for DB2 automation have been changed. For details see *IBM Tivoli System Automation for z/OS Product Automation Programmer's Reference and Operator's Guide*.

The automation of message DSNB309I no longer initiates a shutdown of the DB2 subsystem, instead the status of the application is changed to HALTED.

In SA z/OS 3.2, the shutdown of a DB2 master was processed as follows:

- If the Shutdown Indoubt option in the DB2 CONTROL policy item was set to NO, SA z/OS checked for indoubt threads before starting the shutdown process, and changed the status of the subsystem to PROBLEM if it found threads.
- It was recommended that you define the command `INGRDTTH &SUBSAPPL S` as the SHUTNORM command for the DB2 master. When called with these parameters, the INGRDTTH command first issued the stop DB2 command, then canceled any threads that were still active and afterwards repeatedly checked for any threads that were still active. The number of repetitions and the time interval between the processing cycles were taken from the Terminate Thread Delay and Terminate Thread Cycles options in the DB2 CONTROL policy item of the DB2 master. After having exhausted the maximum allowed cycle number, the commands defined for message ID SHUTFORCEDDF were issued.

SA z/OS 3.3 provides smaller function modules that allow you to design your own shutdown process. The INGDB2 command supports additional parameters for this. You should use INGDB2 to define the shutdown process instead of the INGRDTTH command, because INGRDTTH will be withdrawn in a future release of SA z/OS. Once INGRDTTH is removed, the defined commands for

SHUTFORCEDDF are no longer respected. For details, see the *DB2 best practice policy that contains definitions for the shutdown process of the DB2 master.

For the recovery of DB2 table spaces, the SA z/OS 3.2 automation table contained forced automation table statements for the following messages that called INGRDSTS to start recoverable table spaces in response to these messages

- DSNB250E
- DSNB311I
- DSNB312I
- DSNB320I
- DSNB321I
- DSNB322I
- DSNB323I
- DSNB350I
- DSNB351I

In SA z/OS 3.3 these forced message definitions have been removed. The start command for the table spaces is now expected to be defined in the automation policy.

Note: Using INGDB2 with the new parameters on a system that is running an earlier version of SA z/OS does not cause any harm. However, if you use INGDB2 within the SHUTINIT commands and this automation policy is used with SA z/OS 3.1 or SA z/OS 3.2, you are not allowed to enable return code checking (that is, do not specify an asterisk (*) in the **Automated Function** field).

Migration Steps

What to do	When
Step 1. Change the shutdown definitions for the DB2 master as suggested in the *DB2 best practice policy.	If you accept that the Shutdown indoubt option of the DB2 CONTROL policy item is assumed to be YES, this migration step can be done at any time after having upgraded the runtime library of the SA z/OS automation agent to SA z/OS 3.3. Otherwise the migration step has to be done when upgrading the runtime library of the SA z/OS automation agent to SA z/OS 3.3.
Step 2. Remove the command definitions for SHUTFORCEDDF.	The command definition for SHUTFORCEDDF can be removed as soon as the INGRDTTH command has been removed in the shutdown definitions.
Step 3. In the automation policy, define INGDB2 TABLE,&SUBSAPPL,START commands for the following messages: • DSNB250E • DSNB311I • DSNB312I • DSNB320I • DSNB321I • DSNB322I • DSNB323I • DSNB350I • DSNB351I	You must perform this migration step before upgrading the runtime library of an SA z/OS automation agent to SA z/OS 3.3.

IMS Automation Migration

Migration effort for IMS Automation is needed because RESTARTABORT has been retired, as follows:

Definition of IMS FDR Regions:
In contrast to earlier releases, SA z/OS 3.3 expects IMS FDR regions to be defined with application type IMS and subtype FDR. You must therefore check your automation policy definitions for IMS FDR regions.

Emergency Restart Command Definitions for Message ID RESTARTABORT:
In earlier SA z/OS releases, the RESTARTABORT message ID was used to specify emergency restart commands. These commands were issued in response to the messages DFS033I, DFS166, DFS0618A, DFS3131I and DFS3626I.

In SA z/OS 3.3, the corresponding forced automation table statements have been removed to provide you with more flexibility in message automation.

It is now your responsibility to define the emergency restart commands in the automation policy for the DFS033I and DFS0618A message IDs.

IMSRCMD Command:
The IMSRCMD command has been withdrawn in SA z/OS 3.3. Use the INGEXEC command instead.

ACORESTART Definitions:
Remove the EVIEE00A command from the ACORESTART message ID of the MESSAGES/USER DATA policy item of IMS control regions.

XRF Support:
XRF is no longer supported once you start using an automation policy that has been built by SA z/OS 3.3.

ProcOps Control File Replacement

Manual migration effort is needed if there are systems of type MVS in the policy database where the MVS Sysid differs from the ProcOps/Image name.

Automation Policy Considerations

Take note of the following when defining your automation policy:

- Major thresholds that are defined for the User E-T Pairs (UET) entry type are no longer supported. You must manually migrate them to minor MVSESA thresholds in the MINOR RESOURCES policy item of the MVS Component entry type. You can only use the definitions in UETs for systems that are running earlier versions of SA z/OS.
- Because of changes in the configuration file structure, you must run a full build of the configuration files (that is, of Type=ALL) at least once after you have installed SA z/OS 3.3.
- As soon as you use the SA z/OS 3.3 automation policy in a mixed environment with an SA z/OS 3.1 automation agent, the CICS link and health monitoring function via the PPI is no longer available.
- Some migration effort is needed if you have defined a NONMVS application in your policy database that uses the NETCONV command to start and stop the connection between the NMC environment on the host and your NMC server. This is only necessary if you have specified a job name other than NETCONV for this application.

In this case, you must overwrite the automation table statements for the up message, DUI401I, and the final termination message ,DUI417I, to pass the actual job name instead of NETCONV when calling ACTIVMSG or TERMMSG.

```
IF MSGID = 'DUI401I' THEN
EXEC(CMD('ACTIVMSG JOBNAME=NETCONV,UP=YES')ROUTE(ONE %AOFOPGSSOPER%));
```

- In SA z/OS 3.3 the following definitions for TWS Automation are no longer required and you should remove them:
  - TWSCTRL/ACORESTART:
    ```
    MVS F &SUBSJOB,STATUS
    EVJEAC01
    ```
  - TWSCTRL/UP:
    ```
    EVJEAC01
    EVJEAC02
    ```
- The *BASE PDB sample carries changes to the MVC option MVS_COMPONENTS policy for IEF238D and IEF402I which should be incorporated into your policy to obtain full functionality for these messages.

NetView Automation Table Migration

A new NetView automation table (AT), INGMSGSA, is delivered by SA z/OS. It contains about 50 message traps, basically for NetView and SA z/OS SysOps base messages. If you use the dynamic AT load and refresh (AOFSMARTMAT > 0), this AT is loaded as the first AT, ahead of the list of ATs that is declared in the SA z/OS customization dialog. There is no need for you to specify INGMSGSA anywhere.

If you do not exploit the dynamic AT build process, it is nevertheless recommended that you use this new AT and make sure that the traps in your own ATs are not duplicate and do not conflict with the specifications in INGMSGSA. Changes via service that affect the build of ATs are shown in the customization dialog in an APAR apply panel whenever you open a policy database after a new APAR has been installed.

If you use the dynamic AT build, the new INGMSGSA AT is also loaded for systems that are running earlier releases of SA z/OS. The code changes for this and the INGMSGSA member itself are available in a specific compatibility APAR. If you do not use the dynamic AT build you should also consider adding INGMSGSA to the ATs on any systems that are running earlier releases of SA z/OS.

The following automation routines have been deleted and should no longer be used in your ATs. The corresponding functions are now handled by standard SA z/OS automation:

- EVEEARMW
- EVEED004
- EVEEI004
- EVEEI006
- EVEEI009
- EVEEI010
- EVEEI011
- EVEEI115
- EVEERLSI
- EVEETUOW
- EVEET001
- EVEET002
- EVEET003

- EVEET004
- EVEET005
- EVERSPPI
- EVIEET00
- EVIEI00Q
- EVIEI006
- EVJEAC03
- EVJRAC05
- INGRDCNM

The variable &SUBSJOB from previous releases is replaced with &*JOBNAME.. A detailed informational message is issued for each occurrence during an initial conversion of the policy database policy database in the customization dialog.

If the IEF403I message is specified for an application and status UP is selected, an AT entry was generated with a call to ACTIVMSG with the parameter UP=YES. During initial conversion of the customization dialog the UP=YES parameter is replaced by setting the new field, **Skip ACTIVE status**, to YES in the APPLICATION INFO policy item. The ACTIVMSG routine also checks for this new option and then automatically sets the status to UP.

While using a SA z/OS 3.3 built configuration on a system running SA z/OS 3.1 or SA z/OS 3.2 in a mixed environment with SA z/OS TWS Automation enabled, the following traps must be added to INGMSGU1 on the down-level releases:

```
*
*TWS controller is up
*
IF
MSGID ='EQQN013I'
 THEN
 EXEC(CMD('EVJRSACT')ROUTE(ONE %AOFOPGSSOPER%));

*
*TWS controller is up in standby mode
*
IF
MSGID = 'EQQZ128I'
 THEN
 EXEC(CMD('EVJRSACT')ROUTE(ONE %AOFOPGSSOPER%));
```

MPF Member Migration

The INGEMPF sample member contains all the IDs of messages that occur in the INGMSGSA automation table that is delivered by SA z/OS together with the following default specification:

```
.DEFAULT,SUP(YES),RETAIN(I,CE),AUTO(YES)
```

The dynamically-created MPFLSTSA member contains all the message IDs that occur in the dynamically-generated automation table with the default specification:

```
.NO_ENTRY,SUP(NO),RETAIN(I,CE),AUTO(NO)
```

Thus any messages that do not have automation specified for them (that is, they are not listed in MPF) are not driven through the AT, but are visible for the operator. Installations with an automation environment setup that allows automation to run with `.NO_ENTRY AUTO(NO)` can use a concatenation of the INGEMPF member and the dynamically-created MPFLSTSA member for MPF.

Miscellaneous

Take note of the following changes:

- There are various changes in alert notification:
  - For processing internal alert points SA z/OS requires the ALRTOPER auto operator, which is contained in the *BASE best practice policy.
  - If you are using exit AOFEXC17, you must recode it because of changes to the parameters and return codes.
  - Use the latest version of INGRNIOM in SA IOM if required.
- The SA z/OS REXX function package is required. See "Step 6F: Add the INGRXFPG REXX Function Package" on page 72.
- Status File Restructuring: ASF no longer offers the option REQ=DEL . ASF REQ=DISP displays time stamps in new format with additional seconds. REQ=REPL is only supplied to delete error occurrences.
- Status File Display: The error timestamps are displayed in reverse order, so that the newest time stamps appear at the top of the list. The numbering is unchanged, counting from the oldest to the newest timestamp.
- Important WTORs: The default color in SDF and NMC now pink. To have red WTORs, define them with a severity of CRITICAL.
- Removal of Warm Start Cache: Because the warm start cache has been removed in SA z/OS 3.3, the replies WARM, COLD, TABLE, NOSAVE, and REFRESH are no longer accepted for the WTOR AOF603D. After Migration to SA z/OS 3.3, you can clean up the Save/Restore Database (GLOBALV PURGEC AOF* CFG* EVI* EVE* EVJ* ING*).
- NOSTART Option: The behavior of the NOSTART option when replying AOF603D has changed. Now the automation agent is suspended (see the INGAMS suspend option in *IBM Tivoli System Automation for z/OS Operator's Commands*).
- The suffix of message AOF501I has been changed from I to E.
- A copy of INGMSG02 is created during initialization and stored in the common storage of the DD statement DSIPARM.
- For USS automation command INGUSS, there are no defaults for the file descriptors parameters. If file descriptors are required, then you must define them explicitly. If parameter FDOPEN=YES is specified, then the file descriptors STDOUT and STDERR are assigned to /dev/console and opened. For more details, see the INGUSS description in *IBM Tivoli System Automation for z/OS Programmer's Reference*.
- Auto operator reassignment: The processing of orders sent from the automation manager to the automation agents was moved from RPCOPER to GSSOPER.

Equivalents to Retired Commands

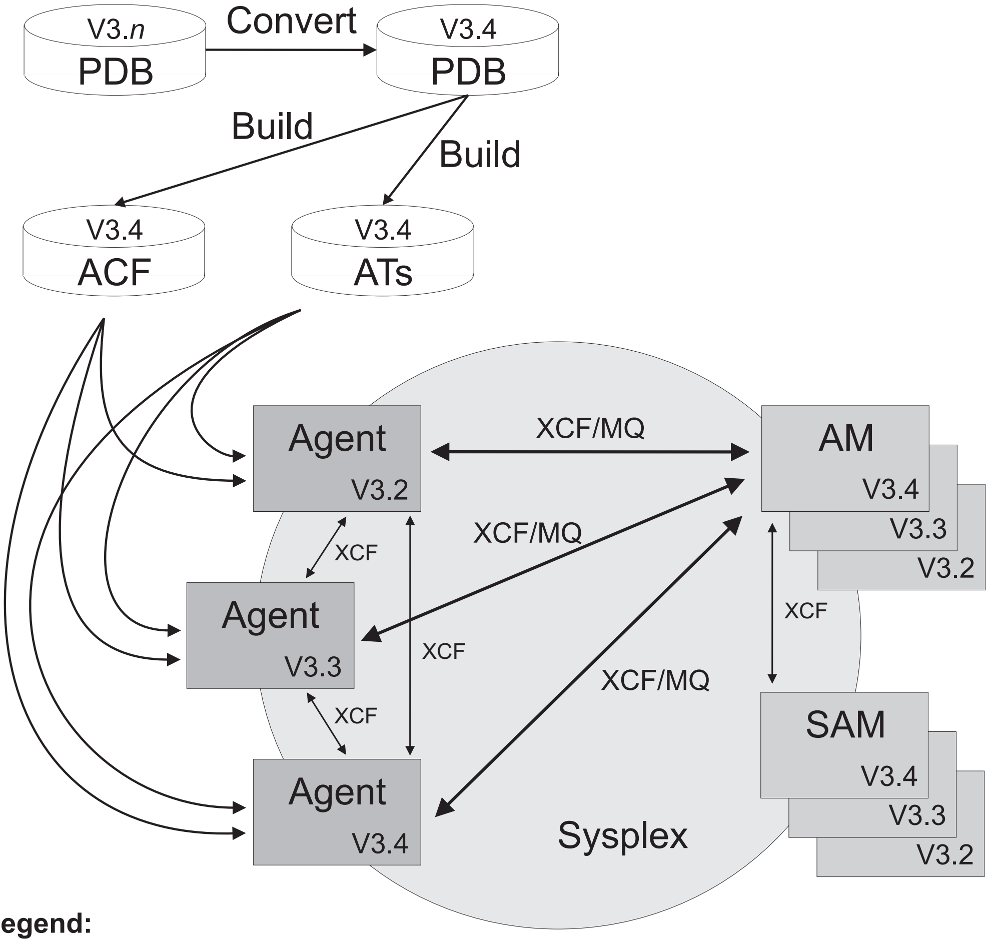
Command Retired in V3.2	Equivalent
DISPWTOR	SDF or DISPINFO

Command Retired in V3.3	Equivalent
DFCRIT	AOFCPMSG
DFUPDT	AOFCPMSG, AOCUPDT

Coexistence of SA z/OS 3.4 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 3.4. This means that you may be running different releases at the same time.

SA z/OS 3.4 systems can coexist with SA z/OS 3.3 and SA z/OS 3.2 systems in the same sysplex. Figure 21 illustrates this: it shows a sysplex with three automated systems and a separate automation manager (and its secondary).



Legend:
PDB: Policy database
ACF: Automation agent's automation configuration files
AT: NetView automation tables

Figure 21. Coexistence of SA z/OS 3.4, SA z/OS 3.3, and SA z/OS 3.2

Any policy database created by a earlier version of the customization dialog (that is, earlier than SA z/OS 3.4) is automatically converted into the SA z/OS 3.4 format when the policy database is opened the first time using the SA z/OS 3.4 customization dialog.

The automation configuration files that are built by the SA z/OS 3.4 customization dialog can be used by any automation agent running either SA z/OS 3.4, SA z/OS 3.3, or SA z/OS 3.2.

The NetView automation table (AT) that is created by the SA z/OS 3.4 customization dialog can be used by automation agents running either SA z/OS 3.3 or SA z/OS 3.2, but the automation table INGMSGSA is required for compatibility with SA z/OS 3.2.

In a sysplex (that is, the same XCF group) automation agents running SA z/OS 3.4, SA z/OS 3.3, or SA z/OS 3.2 can communicate with an SA z/OS 3.4 automation manager. The communication is via XCF. The automation agents communicate with each other via XCF.

Appendix G. CICS Automation Migration from SA z/OS 3.2

This section describes migration steps that are required for CICS applications when upgrading to SA z/OS 3.3. These steps only apply for the automation of those subsystems that have been defined as applications of type CICS. It has the following subsections:
- "Automation of CICS Subsystems"
- "CICS Link and Health Monitoring" on page 216
- "Resynchronization" on page 217
- "Reload of CICS Message Exit Policy" on page 218
- "Automation of DFHKE0408D Message" on page 218
- "Start Type Switch in SA z/OS for CICS Subsystems" on page 219
- "Enforcing the CICS Start Type INITIAL or AUTO" on page 219
- "Status Changes dependent on Abend Codes" on page 220
- "Automation Operator Definitions for CICS" on page 221
- "Replacing Removed Functions" on page 222
- "CICS Shutdown because of Message DFHLG0739 or DFHLG0750" on page 223
- "Short-on-Storage Handling" on page 223
- "Overriding System Initialization Table (SIT)" on page 223
- "CICS Information with DISPINFO Command" on page 224

Automation of CICS Subsystems

Although the CICS feature has been integrated into the base SA z/OS product for some time, there is still specific program code for CICS automation, CICS-specific policy items and CICS-specific needs for the automation policy definitions.

Because the base functionality of SA z/OS has been enhanced to provide most of the automation needs of CICS automation, large parts of the CICS feature code have become obsolete. This allows for a tighter integration of CICS automation into the base SA z/OS product, provided that the automation policy definitions are adapted to the needs of the base SA z/OS functions.

SA z/OS 3.3 now exploits the base functionality for startup, shutdown, recovery and monitoring of CICS applications. Because the obsolete CICS feature code is no longer included in SA z/OS 3.3, some of the CICS-feature-specific definitions in the automation policy are no longer applicable and must therefore be migrated before the automation policy can be used by SA z/OS 3.3. Because of its complexity, this adaptation is expected to be done manually during the upgrade to SA z/OS 3.3. No automatic conversion will be provided.

With this integration step, the automation of the CICS subsystem is now covered to a large extent by the base SA z/OS functionality, and the CICS-specific automation policy definitions are no longer needed. This standardization reduces complexity and facilitates the administration of system automation as well as system operation.

The following CICS automation-specific functions have been removed in SA z/OS 3.3:
- Link and health monitoring via PPI communication
- The CICS command
- The CICSOVRD command
- The CICSRCMD command

- The CICSRSYC command
- The CICSSHUT command
- The CICSQRY command
- The CMASSHUT command

Migration from SA z/OS 3.1 or SA z/OS 3.2 to SA z/OS 3.3 requires the following steps:

Step 1. You must carry out the migration activities in this step before the automation policy that is built with SA z/OS 3.3 can be used by a SA z/OS 3.1 or 3.2 automation agent in the sysplex. These activities do not depend on each other.

- Convert the CICS link and health monitoring so that it is based on the events that are received by the CICSPlex System Manager. See "CICS Link and Health Monitoring."
- Install the compatibility APAR OA26007 on each system in the sysplex.

Step 2. The migration activities for the following issues can be carried out in the current SA z/OS 3.1 or 3.2 release, after you have completed Step 1.

You must complete some of the migration activities before you use the automation policy that has been built with SA z/OS 3.3, and the others at the latest before updating the SA z/OS agent with the SA z/OS 3.3 runtime libraries.

For details see the following:

- "Resynchronization" on page 217
- "Reload of CICS Message Exit Policy" on page 218
- "Automation of DFHKE0408D Message" on page 218
- "Start Type Switch in SA z/OS for CICS Subsystems" on page 219
- "Enforcing the CICS Start Type INITIAL or AUTO" on page 219
- "Status Changes dependent on Abend Codes" on page 220
- "Automation Operator Definitions for CICS" on page 221
- "Replacing Removed Functions" on page 222

Step 3. When you perform the following migration activities depends on whether you use the automation table that is automatically built by SA z/OS:

- If you use the automation table that is built by SA z/OS, you must carry out the following migration activities directly before using the automation policy of SA z/OS 3.3.
- If you use your own automation table, you must carry out the following migration activities before upgrading the runtime library of any SA z/OS automation agent in the sysplex to SA z/OS 3.3.

For details see the following:

- "CICS Shutdown because of Message DFHLG0739 or DFHLG0750" on page 223
- "Short-on-Storage Handling" on page 223
- "Overriding System Initialization Table (SIT)" on page 223

CICS Link and Health Monitoring

CICS link and health monitoring based on PPI communication between SA z/OS and CICS is no longer supported in SA z/OS 3.3, as announced in SA z/OS 3.2.

Since SA z/OS 3.2, SA z/OS provides an infrastructure that allows the monitoring of CPSM objects, such as CICS links, based on the events that are received by the CICSPlex System Manager (CPSM). For details of this function, see *IBM Tivoli*

System Automation for z/OS Customizing and Programming and *IBM Tivoli System Automation for z/OS Product Automation Programmer's Reference and Operator's Guide*.

The infrastructure for the PPI communication between SA z/OS and CICS that was previously provided is no longer needed for CICS link monitoring. Also, instead of the CEMTPPI API, the INGCICS command can be used to issue any console-enabled CICS transaction.

The CICSHLTH command that was provided in earlier SA z/OS releases for controlling the health check function has also been removed.

Migration Steps

What to do	When
Step 1. Unlink the defined CICS links with the Product Automation policy object by deselecting the links in the Where Used policy item.	Before the automation policy that is built with SA z/OS 3.3 can be used by any SA z/OS 3.1 or 3.2 automation agent in the sysplex.
Step 2. Replace the usage of the CEMTPPI API with appropriate INGCICS calls.	Carry out these steps in the given order before upgrading any SA z/OS automation agent in the sysplex with the SA z/OS 3.3 runtime libraries.
Step 3. Remove the definition of the CICSCPPI automated function via the Automation Operator Definitions automation policy.	
Step 4. Clean up the CICS system definitions (CSD), which was previously needed for PPI communication and CICS link and health monitoring. Do this by removing the definitions for EVEGRP1, EVEGRP2, EVEGRP3 and EVEGRP4 and add the new definitions for EVEGRP1 as provided in the sample job EVESJ015.	
Step 5. Remove the User Defined definitions for the HEALTHCHK message ID from the MESSAGES/USER DATA policy item for the CICS subsystem.	

Resynchronization

In earlier SA z/OS releases, the information that was stored about defined CICS subsystems had to be resynchronized after a NetView restart, a configuration refresh, or a reload of the automation policy. This was done by defining the CICSRSYC command for the ACORESTART message ID in the MESSAGES/USER DATA policy item for CICS subsystems.

This resynchronization is no longer needed in SA z/OS 3.3 for CICS subsystems and the CICSRSYC command is no longer available in SA z/OS 3.3.

Migration Steps

What to do	When
Remove the CICSRSYC command from the ACORESTART message ID in the MESSAGES/USER DATA policy item for your CICS subsystems.	As soon as CICS link and health monitoring has been converted to be based on events that are received by the CICSPlex System Manager. You must remove these definitions at the latest before upgrading any SA z/OS automation agent in the sysplex with the SA z/OS 3.3 runtime libraries.

Reload of CICS Message Exit Policy

In earlier SA z/OS releases, the transaction to reload the CICS message exit policy on a configuration refresh had to be specified in the **Reload transaction** field of the CICS CONTROL policy item.

In SA z/OS 3.3, the command to reload the CICS message exit policy on a configuration refresh must be specified in the MESSAGES/USER DATA policy item for the ACORESTART message ID of the CICS subsystem. This reload command updates the message definitions in the CICS message exit.

Migration Steps

What to do	When
Depending on the version of the customization dialog that you are using: • If you are using a version of the customization dialog that still provides the CICS CONTROL policy item, specify NONE in the **Reload transaction** field. • If the previous value of the Reload transaction field was not NONE, specify the following command for the ACORESTART message ID of the subsystem: `MVS F &SUBSJOB,`*`reload_transaction`* Where *reload_transaction* is the previous value of the **Reload transaction** field. Specify SARL as *reload_transaction* if this field was previously empty.	You can make these definitions in your original version of SA z/OS 3.1 or 3.2. You should do this at the latest before using the SA z/OS 3.3 automation policy on any system.

Automation of DFHKE0408D Message

The DFHKE0408D message is issued when an attempt to REGISTER with the MVS automatic restart manager (ARM) fails during a cold or initial start that was specified in the system initialization table (SIT):

```
DFHKE0408D applid PLEASE SPECIFY START TYPE, 'ASIS' OR 'AUTO'
```

In this situation, CICS relies on ARM to determine whether to override the start type and change it to AUTO. Because the REGISTER has failed, CICS now waits until the operator supplies the START type to be used.

In earlier SA z/OS releases, one of the replies that was defined in the MESSAGES/USER DATA policy item for this message was issued, selecting the ARMSTART or NOARMSTART definition.

In SA z/OS 3.3, the forced NetView automation table statement for this function has been removed.

Migration Steps

What to do	When
1. Define the reply (for example, ASIS) that is to be issued for the DFHKE0408D message in the MESSAGES/USER DATA policy item of the issuing CICS subsystem. Do not specify a selection for this reply definition. 2. Remove the reply definitions that have the selections ARMSTART and NOARMSTART.	You can replace the reply definitions for the DFHKE0408D message in your original version of SA z/OS 3.1 or 3.2. You must do this at the latest before the SA z/OS 3.3 automation policy is used on any system.

Start Type Switch in SA z/OS for CICS Subsystems

In earlier releases of SA z/OS, when starting a CICS subsystem with start type NORM, the SA z/OS automation agent issued the start commands that were defined for start type AUTO.

SA z/OS 3.3 no longer changes the start type of CICS subsystems from NORM to AUTO.

Migration Steps

What to do	When
For CICS subsystems, provide additional start commands for start type NORM or replace the selection name AUTO with NORM.	You can define the start commands for start type NORM in your original version of SA z/OS 3.1 or 3.2. You must define them at the latest before upgrading the SA z/OS automation agent with the SA z/OS 3.3 runtime libraries.

Enforcing the CICS Start Type INITIAL or AUTO

In earlier releases of SA z/OS, a CICS start of type INITIAL or AUTO was enforced in response to certain messages.

A CICS start of type INITIAL was enforced in response to the following messages:

- DFHLG0736
- DFHLG0738
- DFHLG0740
- DFHDM0106
- DFHRM0134
- DFHRM0136
- DFHRM0144
- DFHRM0401

A CICS start of type AUTO was enforced in response to the DFHRM0203 message.

In SA z/OS 3.3, a change of the CICS start type is no longer enforced in response to these messages. In situations where one of the messages given above is issued, it is now your responsibility to enforce the start type INITIAL or AUTO for the next CICS start. You can set the start type with the INGSET command.

To issue the INGSET command in response to a received message, you use the MESSAGES/USER DATA policy item to define the INGSET command for the message of the issuing subsystem with the following format:

```
INGSET SET subsystem STARTTYPE=start_type
```

In addition, define a start command with the specified start type as the selection that initiates an INITIAL or AUTO CICS start.

Migration Steps

What to do	When
Step 1. Decide whether the start type of the next CICS start has to be forced to INITIAL or AUTO for the messages given above. Step 2. Define the appropriate INGSET command to set the start type for the subsystem's next startup in response to the related message. Step 3. Define start commands for the specified start type that initiate an INITIAL or AUTO CICS start.	You can define the INGSET commands in the current release of SA z/OS 3.1 or 3.2. These commands are not issued as long as you do not use the NetView automation table that is built with SA z/OS 3.3. You must make these definitions at the latest before either using the NetView automation table that is built with SA z/OS 3.3 or upgrading the runtime libraries of the SA z/OS automation agents to SA z/OS 3.3.

Status Changes dependent on Abend Codes

In earlier SA z/OS releases, code definitions for the ABCODESYSTM message ID were used to specify whether an abending subsystem should be restarted, based on the CICS abend message that was issued. These codes were defined with the MESSAGES/USER DATA policy item for the affected subsystem.

Code1	Code2	Code3	Value Returned
message_ID	*abend_code1*	*abend_code2*	RESTART|NORESTART

These code definitions were checked for the following CICS abend messages:

- DFHCC0001
- DFHPC0401
- DFHPC0405
- DFHPC0408
- DFHPC0409
- DFHSR0606

In SA z/OS 3.3, the status change is no longer initiated by the CICS abend messages but is based on the IEF450I system abend message. Thus the base functionality of SA z/OS can be used to specify whether an abending CICS subsystem should be restarted. This is done by specifying code definitions for the IEF450I system abend message to specify the status that the abending subsystem should be changed to. These code definitions can be specified for the abending subsystem or for MVS components. The code definitions are interpreted in the following way:

Code1	Code2	Code3	Value Returned
jobname	*system_completion_code*	*user_completion_code*	*status* [*start_type*]

The first token of the returned value of the matching code definition determines whether the subsystem is stopping, abending or breaking, or that the received message already indicates the corresponding final termination status. The optional second token of the returned value determines the start type of the subsystem's next startup.

Migration Steps

What to do	When
Step 1. Convert your current code definitions for the ABCODESYSTM message ID to corresponding code definitions for the IEF450I system abend message. Note the semantic differences between the code definitions for these two messages.	You can make the additional code definitions for the IEF450I system abend message in your original SA z/OS 3.1 or 3.2 release. You must do this at the latest before upgrading the runtime library of an SA z/OS automation agent in the sysplex to SA z/OS 3.3.
Step 2. Remove the code definitions for the ABCODESYSTM message ID from your automation policy.	Do not remove the code definitions for the ABCODESYSTM message ID before upgrading the runtime libraries of the SA z/OS automation agents on all the systems in the sysplex to SA z/OS 3.3.

Automation Operator Definitions for CICS

Assign EVE Messages

In earlier SA z/OS releases, all SA z/OS messages for CICS automation, that is, all messages with the prefix EVE, were assigned to the CICSMSTR automated function.

In SA z/OS 3.3, CICS automation is mainly performed by base SA z/OS functions. Thus, SA z/OS 3.3 no longer issues CICS-specific messages. It is therefore no longer necessary to assign EVE messages to the CICSMSTR automated function.

Migration Steps

What to do	When
In the Automation Operator Definitions policy object, remove EVE* from the messages for the CICSMSTR automated function.	You can remove the definitions for the EVE* messages in your original SA z/OS 3.1 or 3.2 release.

Replacing Removed Functions

Along with CICS link and health monitoring via PPI communication, the following functions have been removed in SA z/OS 3.3:

- The CICS command
- The CICSOVRD command
- The CICSRCMD command
- The CICSRSYC command
- The CICSSHUT command
- The CICSQRY command
- The CMASSHUT command

CICS command

In earlier SA z/OS releases, the CICS main menu was provided by the CICS command. Because the monitoring function has been removed, you can call directly the remaining functions of this panel with the following commands:

- INGINFO
- INGREQ
- DISPTRG
- INGSCHED
- INGCICS

CICSOVRD command

In earlier SA z/OS releases, the CICSOVRD command allowed you to set CICS SIT override conditions prior to the next CICS startup.

Use the INGSET and INGREQ commands instead to specify the start type and further start parameters for the next CICS startup. For details, see "Enforcing the CICS Start Type INITIAL or AUTO" on page 219.

CICSRCMD command

Replace the CICSRCMD command with the INGEXEC command that automatically routes commands to the system where the specified resource resides.

CICSRSYC command

This command is no longer needed and can be removed from the automation policy as described in "Resynchronization" on page 217, after having converted the CICS link and health monitoring to use the events that are received by the CICSPlex SM.

CICSSHUT command

Replace this command by issuing the following command instead:

```
MVS F &SUBSJOB,CEMT PERFORM SHUTDOWN NORM
```

CICSQRY command

In earlier SA z/OS releases, the CICSQRY command was provided to retrieve CICS subsystem information. Most of this information can also be queried with the AOCQRES, INGQRY and AOFTREE commands via an INGEXEC call.

Replace this command by issuing an appropriate SA z/OS command.

CMASSHUT command

Replace this command by issuing the following command instead:

```
MVS F &SUBSJOB,COSD
```

CICS Shutdown because of Message DFHLG0739 or DFHLG0750

In earlier SA z/OS releases, CICS was shut down automatically in response to message DFHLG0739 or DFHLG0750.

SA z/OS 3.3 no longer shuts down CICS in response to these messages.

Migration Steps

What to do	When
If you want CICS to be shut down if the messages DFHLG0739 or DFHLG0750 are issued, you must code the following command in the MESSAGES/USER DATA policy item for these messages: `MVS F &SUBSJOB,CEMT PERFORM SHUTDOWN NORMAL`	You must make these definitions directly before using the NetView automation table that is built with SA z/OS 3.3 or before upgrading runtime libraries of the SA z/OS automation agents to SA z/OS 3.3.

Short-on-Storage Handling

In earlier SA z/OS releases, short-on-storage situations were handled using definitions in the automation policy for the RCVRSOS message ID and the threshold definition for the minor resource *subsystem*.RCVRSOS.

From SA z/OS 3.2, it is advisable to replace the technique for this functionality with event-based CICSPlex monitoring. The definitions for message ID RCVRSOS are therefore no longer automatically put into action by SA z/OS.

Migration Steps

What to do	When
If you later want to process short-on-storage situations as in earlier SA z/OS releases, keep your definitions in the automation policy for message ID RCVRSOS and additionally define command EVEES100 to be issued in response to the following messages • DFHSM0131 • DFHSM0132 • DFHSM0133 • DFHSM0134	These definitions must be made directly before using the automation table that is built with SA z/OS 3.3 or before upgrading runtime libraries of the SA z/OS automation agents to SA z/OS 3.3.

Overriding System Initialization Table (SIT)

In earlier SA z/OS releases, the WTOR messages DFHPA1104 and DFHPA1105 were automatically replied to by SA z/OS with the reply `START=`*`start_type`*`,`*`applparms`* and `.END`. This function was achieved with a forced automation table statement.

In SA z/OS 3.3, the automation table statement for this function has been removed. The replies to be issued in response to messages DFHPA1104 and DFHPA1105 can now be specified with the automation policy item MESSAGES/USER DATA for the issuing subsystem.

Migration Steps

What to do	When
In order to provide the possibility for a MANUAL CICS start, where the value of the Appl Parms parameter of INGREQ is used as reply, define the following replies with the MESSAGES/USER DATA policy item: • For message DFHPA1104, define reply `&APPLPARMS` • For message DFHPA1005, define reply `.END`	These definitions must be done directly before using the automation table that is built with SA z/OS 3.3 or before upgrading runtime libraries of the SA z/OS automation agents to SA z/OS 3.3.

CICS Information with DISPINFO Command

Display of CICS Start Type

In earlier SA z/OS releases, the CICS start type as shown in the DFHSI1502I CICS startup message was displayed in the output of the DISPINFO command as the CICS start type under the title CICS Information.

In SA z/OS 3.3, the output of the DISPINFO command no longer includes the section with CICS-specific information. The CICS start type can now be extracted from the CICS startup message DFHSI1502I, that is included as a captured message in the output of DISPINFO.

The start type of a subsystem, as defined in SA z/OS, is still shown in the output of the DISPINFO command together with the time stamp of the start. It is displayed in the following format:

```
Last start        : 11:30:27 on 10/06/08    Type  : NORM
```

This display applies to all subsystem types, not only CICS subsystems.

Display of other CICS-Specific Information

In earlier SA z/OS releases, other CICS-specific information was displayed under the title CICS Information besides the CICS start type in the output of the DISPINFO command.

This CICS-specific information is no longer displayed in SA z/OS 3.3. Note that this information is no longer reliable as soon as you use an automation policy that has been built with SA z/OS 3.3.

Appendix H. Ensemble Hardware Management Console Setup

Setting up the Hardware Management Console for use with System Automation for z/OS

In order to exploit the Web Services API of the zEnterprise System Hardware Management Console (HMC), the following setup actions are required:

1. A user must be defined with the appropriate management scope and task roles to access objects and perform actions at the HMC
2. The Web Services API must be enabled in general and the user defined in step 1 must be enabled to access this interface.

These actions are described in the following subsections in more detail. For a comprehensive reference about management scope and task roles as well as for information about console actions to administrate the HMC environment, refer to the *System z Hardware Management Console Operations Guide Version 2.11.11* or later as well as to *zEnterprise System Hardware Management Console Operations Guide for Ensembles Version 2.11.12* or later.

Defining a user

To define a new user, login at the HMC with the pre-defined user ACSADMIN or with a user that has equivalent authorization to define a new user.

1. Select the User Profiles task.
2. Add a new user:
   a. Select the type of Authentication. For Local Authentication, a password must be specified. If you plan to allow SA z/OS to maintain the password in the VSAM file for the SAFPW user predefined value in the zEnterprise Ensemble SA z/OS customization dialogs, the password value must be 4-8 characters long. If you select LDAP Server as the means for authentication, the server managing the directory that lists this user must be selected or defined first.
   b. Select the Managed Resource Roles that determine to which objects access is permitted for this user. For systems management functions such as monitoring, discovery and availability management, the assumption is the user has access to all resources in the scope of the ensemble managed by this HMC. For this, select the following pre-defined roles. If you want to limit access to certain resources only, you need to have defined corresponding roles yourself:

Table 24. Managed Resource Roles

Managed Resource Roles
BladeCenter Objects
DPXI50z Blade Objects
Defined zCPC Managed Objects
Ensemble Object
IBM Blade Objects
IBM Blade Virtual Server Objects
ISAOPT Blade Objects

Table 24. Managed Resource Roles (continued)

Managed Resource Roles
Workload Objects
z/VM Virtual Machine Objects

c. Select the Task Roles that determine which tasks are permitted on the Managed Resources selected above. Select the following pre-defined roles or equivalent roles that you have created for this HMC:

Table 25. Predefined Tasks and Permissions

Required Task Permissions	Applicable Predefined HMC Task
Activate Task	Operator Tasks
Deactivate Task (Daily task group)	

d. Select other User Properties. Make sure you select Allow access to management interfaces as this enables the user to use the Web Services API.

Enable Web Services API

To enable the Web Services API, login at the HMC with the pre-defined user ACSADMIN or with a user that has equivalent authorization to customize API settings.

1. Select the Customize API Settings task.
2. Select WEB Services and either enable ALL or just specific IP-addresses that are allowed to connect to this HMC.
3. Make sure the user SA z/OS uses to logon to the HMC is selected under User Access Control.

   Note: Users are selected automatically, if the Allow access to management interfaces user property was set for this user (see 2d. Select Other User Properties).

Getting the Hardware Management Console certificate

The communication over secure HTTP requires that all data is encrypted using a secret key. For key exchange, the HMC sends its certificate to the client who can then validate it and when trusted, the keys can be exchanged.

To allow SA z/OS to validate the certificate, its truststore must contain a copy of the public part of the server certificate or it must have a copy of the public part of the Certificate Authority's (CA) certificate. If a server's certificate is not found in the truststore but the certificate of the CA that signed the server's certificate is, then the validation can still be performed.

For self-signed certificates, or for certificates that are signed by a CA that is not in SA z/OS's truststore it is necessary to first obtain a copy of the certificate (its public part). You can do this with your browser by typing in the web address of the HMC into the address field of your browser.

If this is the first access of the HMC for the current web browser session, you can receive a certificate error. In this case, follow the instructions provided by the browser to view and export the certificate. You might have to authenticate with an administrator userid and password before the browser allows you to export the certificate. As an example, this process is outlined for the Firefox browser:

1. Point your browser to the HMC by entering the hostname or the IP-address of the HMC into the URL input field.
2. If the certificate cannot be validated, a warning popup window appears with title **This Connection is Untrusted**. Click on **I Understand the Risks** and then press the **Add Exception...** button.
3. The **Add Security Exception** dialog is displayed.
4. Press button **Get Certificate**. This allows the browser to get the certificate and the **View...** button will be enabled.
5. Press button **View...** to open the **Certificate Viewer** dialog.
6. Verify who issued the certificate and to whom it was issued. If OK, press button **Details** followed by **Export** to save the certificate on your disk.
7. The certificate is stored in text format and can now be copied to the machine where SA z/OS is running and imported into SA z/OS's truststore.

Firewall considerations

When the Web Services API is enabled, the HMC API HTTP server listens for SSL-based socket connections on TCP port 6794. The HMC is enabled for both the SSL version 3 and TLS version 1 protocols on this SSL port. It does not accept non-SSL connections.

As part of the Web Services API, the HMC also provides an integrated JMS message broker based on Apache ActiveMQ Version 5.2.0. This message broker is active on the HMC whenever the Web Services API is enabled.

When active, the integrated broker listens for client connections using the following transports supported by ActiveMQ:

- STOMP (Streaming Text Oriented Messaging Protocol) flowing over SSL connections, listening port 61612.

The broker is enabled for the SSL version 3 and TLS version 1 protocols on these SSL ports.

The listening ports listed above for the API and for the message broker are fixed port numbers and are not subject to customer reconfiguration.

If you have firewalls between SA z/OS and the HMC, you need to contact your network administrator to set up firewall rules that enable communication over these ports across firewalls.

Appendix I. 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.

```
ARMWAIT=nnn
BLOCKOMVS={YES|NO}
BUILDTIMEOUT={ss|180}
CFGDSN=<configuration file data set name>
COMM=XCF
DELAY={ss|0}
DIAGDUPMSG={nnnnn|0}
DIAGINFO=dsname
GRPID={xx|'  '}
IOINTERVAL={n|0}
LIFECYCLE={500|nnnn};MY.AGENT.DATA.SET
LOGSTREAM={YES|NO}
NUMQTHDS={n|9}
OVRDELETEDELAY={dd|0}
PREF={n|0}
PROMPT={YES|NO}
START={COLD|HOT|WARM}
STOPDELAY={ss|30}
TAKEOVERFILE=name
TAKEOVERTIMEOUT={nn|12}
WLMQUERYINTERVAL={n|0}
```

ARMWAIT

Maximum number of seconds the automation manager waits for ARM being up during automation manager initialization. Not specified or 0 specified does not cause the AM to wait.

A value from 0-999 seconds may be specified.

BLOCKOMVS

This parameter allows you to specify whether the automation manager blocks OMVS shutdown as long as the automation manager is active.

YES If BLOCKOMVS=YES is specified, at the automation manager's initialization time, it adds a shutdown block to OMVS. Thus OMVS does not terminate as long as the automation manager is active, even if this is requested by the operator. OMVS is stopped only when the automation manager is stopped with the AM stop command.

Notes:

1. A STOP,DEFER causes the automation manager to terminate when all agents connected to it have terminated. Then the stop command for OMVS will get through.
2. For BLOCKOMVS=YES the automation manager must be UID(0).
3. For BLOCKOMVS=YES to work effectively, the stop command for OMVS must be issued as "F OMVS,SHUTDOWN".

NO If BLOCKOMVS=NO is specified and OMVS shuts down, the automation manager abends due to cancellation by OMVS.

Notes:

1. You should not use STOP, DEFER when BLOCKOMVS=NO is specified as it will cause unpredictable results.

BUILDTIMEOUT

May be used to specify a time limit for the completion of the data structure build process that is used during a COLD or WARM start of the primary automation manager. You can specify a value from 0–180 seconds. A value of 180 (3 minutes) is assumed if omitted. A specification of 0 suppresses timing of the data structure build process.

CFGDSN

The CFGDSN value is used only on a COLD start, and may be overridden by an initialization prompt response. On other start types, the default CFGDSN is the one that was in use when automation was last active.

Specify the name of the control data set that contains the SA z/OS configuration that is read by the SA z/OS automation agent and automation manager.

The name can be a fully qualified data set name or a generation data group (GDG) name (either a GDG base name which defaults to generation level 0, or a GDG base name with a level qualifier, for example(-1)).

COMM

This parameter 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 work items 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 warm start is required when an irrecoverable I/O error occurs while reading from or writing to the takeover file.

DELAY

Is the number of seconds to be used as a default delay prior to determining the operational mode when the automation manager instance is started. The delay option can be used when you IPL several systems concurrently and want to ensure that the primary or secondary automation manager is started on a particular system.

Note that the DELAY parameter applies only to the IPL of a system, whereas the PREF parameter applies only in the case of a takeover.

A delay value from 0–999 seconds may be specified. A value of 0 (no delay) will be assumed if it is omitted.

This value may by overridden on an individual instance basis by the start command parameter.

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 work item recording from the beginning. dsname is the name of the data set that will hold the work items. 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

Specifies the 2-character suffix that composes the XCF group name that is used by the automation manager and the various agents when communicating among each other.

IOINTERVAL

This defines the interval that is used to buffer any I/O to the takeover file. The value can be from 0 to 10 seconds. The default is 0 which means that no buffering is done. The maximum is 10 seconds. At the end of the interval any deferred I/O is done. The recommended value is 3.

LIFECYCLE=*nnnn***;***dataset*

This parameter allows you to prepare for Life Cycle Recording in order to debug automation manager-related problems. Normally, SA z/OS Service will advise when Life Cycle Recording should be enabled. Specify the following:

nnnn Defines the size of the data space in number of megabytes (1 through 2097). A value of 500 is recommended and is sufficient in most situations.

dataset Specifies the fully-qualified DSN to be used when offloading the dataspace to disk.

Note: *nnnn* and *dataset* must be separated by a semicolon without intervening blanks The total length of '*nnnn;dataset*' can be a maximum of 44 bytes.

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 work item history besides that shown in the INGINFO command is available and no detailed information or warning or error messages are available for problem determination.

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 9 will be used. A maximum of 9 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 secondary automation managers (SAMs) should become the primary automation manager.

The value can range from 0 through 15, where 0 is the highest preference. The SAM will only participate in the escalation process when there is no other SAM active with a higher preference. The default is 0.

Note that the PREF parameter applies only in the case of a takeover, whereas the DELAY parameter applies only to the IPL of a system.

PROMPT

Specifying YES lets you overwrite the CFGDSN parameter (the name of the automation manager configuration file). Message HSAM1302A is issued and waits for a response. You can now specify the keyword/value pair:

```
CFGDSN=<fully.qualified.data.set.name>
```

Alternatively you can use a null or 'U' response to indicate that 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 The CFGDSN parameter

2 Schedule overrides

3 The persistent data store (votes, triggers, resource states)

The following table shows where the automation manager retrieves initialization data for the possible values for the START parameter.

	COLD	**WARM**	**HOT**
1	The name of automation manager configuration file is taken from PARMLIB, the START command, or via the PROMPT=YES option.	The last value that was used is taken	The last value that was used is taken
2	Deleted	Taken from the last run	Taken from the last run
3	Deleted	Deleted	Taken from the 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. However, the secondary automation manager reads the CFGDSN parameter from the original HSAPRM*xx* when the SAM was started. Any changes that you make to the HSAPRM*xx* are not reflected in a takeover with a cold start. If you want to perform a cold start with a modified HSAPRM*xx* you must first stop all your SAMs and then restart them.

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. Specify a value in the range 0–999 seconds. The recommended value is 30 seconds.

TAKEOVERFILE
This defines the data set name of the takeover file. It must be fully qualified.

TAKEOVERTIMEOUT
The value, *nn*, may range from 1 to 600 seconds. The default is 12 seconds.

If the (secondary) automation manager performs a takeover, or an automation manager is started HOT, 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.

WLMQUERYINTERVAL
This specifies the time in minutes between queries of WLM by the automation manager, as used for resource aware application move. The default is 0, which means that no querying of WLM is done. The valid range for WLMQUERYINTERVAL is from 0 to 600 minutes (that is, 10 hours).

Syntax for HSAPRM00

Appendix J. INGDLG Command

The INGDLG command allocates required DD names and invokes the ISPF dialog. Its syntax is:

```
►►──INGDLG──┬────────────────────────────┬──┬───────────────────────┬──────────►
            │          ┌─ADMIN─────┐     │  │           ┌─YES─┐     │
            └─SELECT(──┴─IOCONNECT─┴──)──┘  └─ALLOCATE(─┴─NO──┴──)──┘


            ┌────────┐                ┌────────┐
            ▼        │                ▼        │
►─DDname(───DSname───┴─)──SYSEXEC(───DSname───┴─)──AOFPRINT──┬─(DSname)─────────┬──►
                                                              └─(SYSOUT(class))──┘

       ┌─ING───────────────────┐           ┌─none─────────────────┐
►─HLQ(─┴─high level qualifier──┴─)──LLQ(──┴─low level qualifier──┴─)────────────►

►──┬──────────────────────┬──┬────────────┬──────────────────────────────────►◄
   └─INITSEL(entrypoint)──┘  └─fastpath───┘
```

The parameters of the INGDLG command 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 operations command dialogs.

ALLOCATE

Controls defining DD names. If ALLOCATE is not specified, ALLOCATE (YES) is the default.

YES Allocates the necessary libraries according to the specifications in the HLQ and LLQ parameters.

If DDname AOFTABL is specified as an additional parameter, that data set is also allocated for ISPTLIB.

Furthermore, to avoid enqueue situations for multiple users, the name of the ISPF profile data set is obtained and allocated as the first data set of the table input library.

NO Does not perform any allocation of data sets. The libraries needed for the customization dialog need to be allocated before invoking INGDLG.

*DDname***(***DSname***)**

The *DSname* is the fully-qualified data set name that is to be associated with DD name that is specified. The name is not extended with any prefixes or suffixes that are defined using the HLQ and LLQ parameters.

For example, the following specification allocates the data set ING.CUSTOM.AOFTABL to the DD name AOFTABL:

```
AOFTABL(ING.CUSTOM.AOFTABL)
```

SYSEXEC(*DSname DSname DSname* **...)**

For the DD name SYSEXEC multiple data set names are supported:

```
SYSEXEC(DSname DSname DSname ...)
```

This results in the following command:

```
TSO ALLOC ALTLIB ACTIVATE APPLICATION(EXEC)
       DATASET(DSname DSname DSname ...) UNCOND
```

AOFPRINT

For the DD name AOFPRINT, *DSname* is a fully-qualified data set name and the following syntax is 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*.

HLQ Enables you to change the high level qualifier (HLQ) of the SMP/E data sets, which is currently 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

This parameter can be used to provide a user-selected entry point to the customization dialog. If this keyword is specified, you do not see the Customization Dialog Primary Menu as the first panel when invoking the customization dialog. INITSEL 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 a fast path in the customization dialog, for example:

- To reach the APPC application:
  ```
  INITSEL(=APL; S APPC)
  ```
- To reach application group CICS_APG:
  ```
  INITSEL(=APG; S CICS_APG)
  ```
- To reach the Entry Name Selection panel for Applications:
  ```
  INITSEL(=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 deallocation or a failed allocation

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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. See automation configuration 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/OSautomation control file, 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.

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 NPDA 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) See Automation Manager Configuration. (2) The Auto Msg Classes entry type.

American Standard Code for Information Interchange (ASCII). A standard code used for information exchange among data processing systems, data communication systems, and associated equipment. ASCII uses a coded character set consisting of 7-bit coded characters (8-bit including parity check). The ASCII set consists of control characters and graphic characters. See also Extended Binary Coded Decimal Interchange Code.

APF. See authorized program facility.

API. See application programming interface.

APPC. See advanced program-to-program communication.

application. In SA z/OS, applications refer to z/OS subsystems, started tasks, or jobs that are automated and monitored by SA z/OS. On SNMP-capable processors, application can be used to refer to a subsystem or process.

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.

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.

application programming interface (API). An interface that allows an application program that is written in a high-level language to use specific data or functions of the operating system or another program.

ApplicationGroup entry. A construct, created with the customization dialogs, used to represent and contain policy for an application group.

ARM. See 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. See American Standard Code for Information Interchange.

ASF. See automation status file.

authorized program facility (APF). A facility that permits identification of programs that are authorized to use restricted functions.

automated console operations (ACO). The use of an automated procedure to replace or simplify the action that an operator takes from a console in response to system or network events.

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.

automatic restart management (ARM). 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 SA z/OS customization dialogs must be used to build the automation configuration file. It consists of:
- The automation manager configuration file (AMC)
- The NetView automation table (AT)
- The NetView message revision table (MRT)
- 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 that SA z/OS is installed on. 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. See also "automation configuration file."

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 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.

automation status file (ASF). 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

Base Control Program (BCP). A program that provides essential services for the MVS and z/OS operating systems. The program includes functions that manage system resources. These functions include input/output, dispatch units of work, and the z/OS UNIX System Services kernel. See also Multiple Virtual Storage and z/OS.

basic mode. A central processor mode that does not use logical partitioning. Contrast with logically partitioned mode.

BCP. See Base Control Program.

BCP Internal Interface. Processor function of CMOS-390 and System z processor families. It allows for 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.

blade. A hardware unit that provides application-specific services and components. The consistent size and shape (or form factor) of each blade allows it to fit in a BladeCenter chassis.

BladeCenter chassis. A modular chassis that can contain multiple blades, allowing the individual blades to share resources such as management, switch, power, and blower modules.

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.

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.

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.

CI. See console integration.

CICS/VS. Customer Information Control System for Virtual Storage. See Customer Information Control System.

CLIST. See 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 processor control block. An I/O operations internal control block that contains information about the command being processed.

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 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.

converted mode (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.

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 setand XCF couple data set.

coupling facility. The hardware element that provides high-speed caching, list processing, and locking functions in a sysplex.

CP. See central processor.

CPC. See 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. See command processor control block.

CPU. Central processing unit. Deprecated term for processor.

cross-system coupling facility (XCF). 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. See converted mode.

D

DataPower X150z. See IBM Websphere DataPower Integration Appliance X150 for zEnterprise (DataPower X150z).

DASD. See 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. See double-byte character set.

DCCF. See disabled console communication facility.

DCF. See 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.

device. A piece of equipment. Devices can be workstations, printers, disk drives, tape units, remote systems or communications controllers. You can see information about all devices 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 that allows storage to be directly accessed, such as a disk drive.

disabled console communication facility (DCCF). A z/OS component that provides limited-function console communication during system recovery situations.

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).

display. (1) To present information for viewing, usually on the screen of a workstation or on a hardcopy device. (2) Deprecated term for panel.

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.

Document Composition Facility (DCF). An IBM licensed program used to format input to a printer.

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 with 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. See Extended Binary Coded Decimal Interchange Code.

ECB. See event control block.

EMCS. Extended multiple console support. See also multiple console support.

ensemble. A collection of one or more zEnterprise nodes (including any attached zBX) that are managed as a single logical virtualized system by the Unified Resource Manager, through the Hardware Management Console.

ensemble member. A zEnterprise node that has been added to an ensemble.

enterprise. The composite of all operational entities, functions, and resources that form the total business concern and that require an information system.

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.

Enterprise Systems Architecture (ESA). A hardware architecture that reduces the effort required for managing data sets and extends addressability for system, subsystem, and application functions.

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. See 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 System z 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, such that if all events of a trigger condition have occurred, a startup or shutdown of an application is performed.

event control block (ECB). A control block used to represent the status of an event.

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 Binary Coded Decimal Interchange Code (EBCDIC). A coded character set of 256 8-bit characters developed for the representation of textual data. See also American Standard Code for Information Interchange.

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.

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.

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 (HMC). A user interface through which data center personnel configure, control, monitor, and manage System z hardware and software resources. The HMC communicates with each central processor complex (CPC) through the Support Element. On an IBM zEnterprise 196 (z196), using the Unified Resource Manager on the HMCs or Support Elements, personnel can also create and manage an ensemble.

Hardware Management Console Application (HWMCA). A direct-manipulation object-oriented graphical user interface that provides a single point of control and single system image for hardware elements. The HWMCA provides 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 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 provides some level of abstraction from assembler language and independence from a particular type of machine.For the NetView program, the high-level languages are PL/I and C.

HLL. See high-level language.

host (primary processor). The processor that you enter a command at (also known as the *issuing processor*).

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.

HWMCA. See Hardware Management Console Application.

Hypervisor. A program that allows multiple instances of operating systems or virtual servers to run simultaneously on the same hardware device. A hypervisor can run directly on the hardware, can run within an operating system, or can be imbedded in platform firmware. Examples of hypervisors include PR/SM, z/VM, and PowerVM Enterprise Edition.

I

IBM blade. A customer-acquired, customer-installed select blade to be managed by IBM zEnterprise Unified Resource Manager. One example of an IBM blade is a POWER7 blade.

IBM Smart Analyzer for DB2 for z/OS. An optimizer that processes certain types of data warehouse queries for DB2 for z/OS.

IBM System z Application Assist Processor (zAAP). A specialized processor that provides a Java execution environment, which enables Java-based web applications to be integrated with core z/OS business applications and backend database systems.

IBM System z Integrated Information Processor (zIIP). A specialized processor that provides computing capacity for selected data and transaction processing workloads and for selected network encryption workloads.

IBM Websphere DataPower Integration Appliance X150 for zEnterprise (DataPower X150z). A purpose-built appliance that simplifies, helps secure, and optimizes XML and Web services processing.

IBM Enterprise 196 (z196). The newest generation of System z family of servers built on a new processor chip, with enhanced memory function and capacity, security, and on demand enhancements to support existing mainframe workloads and large scale consolidation.

IBM zEnterprise BladeCenter Extension (zBX). A heterogeneous hardware infrastructure that consists of a BladeCenter chassis attached to an IBM zEnterprise 196 (z196). A BladeCenter chassis can contain IBM blades or optimizers.

IBM zEnterprise BladeCenter Extension (zBX) blade. Generic name for all blade types supported in an IBM zEnterprise BladeCenter Extension (zBX). This term includes IBM blades and optimizers.

IBM zEnterprise System (zEnterprise). A heterogeneous hardware infrastructure that can consist of an IBM zEnterprise 196 (z196) and an attached IBM zEnterprise BladeCenter Extension (zBX) Model 002, managed as a single logical virtualized system by the Unified Resource Manager.

IBM zEnterprise Unified Resource Manager. Licensed Internal Code (LIC), also known as firmware, that is part of the Hardware Management Console. The Unified Resource Manager provides energy monitoring and management, goal-oriented policy management, increased security, virtual networking, and data management for the physical and logical resources of a given ensemble.

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 Ops. See I/O operations.

I/O resource number. Combination of channel path identifier (CHPID), device number, etc. See internal token.

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. See Information Management System.

IMS/VS. See 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 (IMS). Any of several system environments available with a database manager and transaction processing that are capable of managing complex databases and terminal networks.

Information Management System/Virtual Storage (IMS/VS). A database/data communication (DB/DC) system that can manage complex databases and networks. Synonymous with Information Management System.

INGEIO PROC. The I/O operations default procedure name. It is part of the SYS1.PROCLIB.

initial microprogram load. The action of loading microprograms into computer storage.

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 files and that prerequisite applications are functional.

input/output configuration data set (IOCDS). A configuration definition built by the I/O configuration program (IOCP) and stored on disk files associated with the processor controller.

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. See also Time Sharing Option.

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. See input/output configuration data set.

IOSP. See input/output support processor..

IPL. See initial program load.

ISPF. See Interactive System Productivity Facility.

ISPF console. You log on to ISPF from this 3270-type console to use the runtime panels for I/O operations and SA z/OS customization panels.

issuing host. The base program that you enter a command for processing with. See primary host.

J

JCL. See job control language.

JES. See job entry subsystem.

JES2. An MVS 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. See also job entry subsystem and JES3

JES3. An MVS 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 complexes that have several loosely coupled processing units, the JES3 program manages processors so that the global processor exercises centralized control over the local processors and distributes jobs to them using a common job queue. See also job entry subsystem and JES2.

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). An IBM licensed program that receives jobs into the system and processes all output data that is produced by jobs. In SA z/OS publications, JES refers to JES2 or JES3, unless otherwise stated. See also JES2 and JES3.

K

Kanji. An ideographic character set used in Japanese. See also double-byte character set.

L

LAN. See 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). See synchronous data link control. (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 on System z. 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 that connects several devices in a limited area (such as a single building or campus) and that can be connected to a larger network.

logical partition (LP). A subset of the processor hardware that is defined to support an operating system. See also logically partitioned 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 and system services control point.

logical unit 6.2 (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 peer relationship between session partners
- Efficient use of a session for multiple transactions
- A comprehensive end-to-end error processing

- A generic application program interface (API) consisting of structured verbs that are mapped to a product implementation

Synonym for advanced program-to-program communication.

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. See logical partition.

LPAR. See logically partitioned mode.

LSN. See logical switch number.

LU. See logical unit.

LU 6.2. See 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. See logical unit 6.2.

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.

M

MAT. Deprecated term for NetView automation table.

MCA. See Micro Channel architecture.

MCS. See multiple console support.

member. A specific function (one or more modules or 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. See message processing facility.

MPFLSTSA. The MPFLST member that is built by SA z/OS.

multi-MVS environment. physical processing system that is capable of operating more than one MVS image. See also MVS image.

multiple console support (MCS). A feature of MVS that permits selective message routing to multiple consoles.

Multiple Virtual Storage (MVS). An IBM operating system that accesses multiple address spaces in virtual storage. The predecessor of z/OS.

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 systems reside on one or more processors. Or one or more processors can communicate with programs on the other systems.

MVS. See Multiple Virtual Storage.

MVS image. A single occurrence of the MVS operating system that has the ability to process work. See also multi-MVS environment and single-MVS environment.

MVS/ESA. Multiple Virtual Storage/Enterprise Systems Architecture. See z/OS.

MVS/JES2. Multiple Virtual Storage/Job Entry System 2. A z/OS subsystem that receives jobs into the system, converts them to an 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.

N

NAU. (1) See network addressable unit. (2) See network accessible unit.

NCCF. See Network Communications Control Facility..

NCP. (1) See network control program (general term). (2) See Network Control Program (an IBM licensed program). Its full name is Advanced Communications Function for the Network Control Program. Synonymous with ACF/NCP.

NCP/token ring interconnection. A function used by ACF/NCP to support token ring-attached SNA devices. NTRI also provides translation from token ring-attached SNA devices (PUs) to switched (dial-up) devices.

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.

NetView (NCCF) console. A 3270-type console for NetView commands and runtime panels for system operations and processor operations.

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 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 that NetView records events relating to NetView and SA z/OS activities in.

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 message table. See NetView automation table.

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. See logical unit 6.2.

NetView-NetView task (NNT). The task that a cross-domain NetView operator session runs under. 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.

network. (1) An interconnected group of nodes. (2) In data processing, a user application network. See SNA network.

network accessible unit (NAU). In SNA networking, any device on the network that has a network address, including 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.

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.

network control program (NCP). (1) A program that controls the operation of a communication controller. (2) A program used for requests and responses exchanged between physical units in a network for data flow control.

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.

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.

NGMF. Deprecated term for NetView Management Console.

NGMF focal-point system. Deprecated term for NMC focal point system.

NIP. See 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. See 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. See Network Problem Determination Application.

NPDA focal-point system. See focal point system.

NTRI. See 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. See 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. See Operations Planning and Control/Advanced.

OPC/ESA. See Operations Planning and Control/Enterprise Systems Architecture.

Open Systems Adapter (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.

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/Enterprise Systems Architecture (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.

optimizer. A special-purpose hardware component or appliance that can perform a limited set of specific functions with optimized performance when compared to a general-purpose processor. Because of its limited set of functions, an optimizer is an integrated part of a processing environment, rather than a stand-alone unit. One example of an optimizer is the IBM Smart Analytics Optimizer for DB2 for z/OS.

OS. See operating system.

OSA. See Open Systems Adapter.

OST. See 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, specifically 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, and 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. A processor controller. Also known as the support processor or service processor in some processor families.

PDB. See policy database.

PDS. See 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 mode.

POI. See 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 automation definitions (automation policy) that the automation programmer specifies using the customization dialog is stored in the policy database. Also known as the PDB. See also automation policy.

POR. See power-on reset.

port. (1) System hardware that the I/O devices are attached to. (2) In 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 that data can enter or leave a data network through. (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.

power-on reset (POR). 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. See initial microprogram load.

PP. See physical partition.

PPI. See program to program interface.

PPT. See primary POI task.

PR/SM. See Processor Resource/Systems Manager.

primary host. The base program that you enter a command for processing at.

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. (1) A device for processing data from programmed instructions. It may be part of another unit. (2) In a computer, the part that interprets and executes instructions. Two typical components of a processor are a control unit and an arithmetic logic unit.

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 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 logically partitioned mode.

ProcOps. See 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 CICS, DB2, IMS, TWS (formerly called *features*).

program operator interface (POI). A NetView facility for receiving VTAM messages.

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.

PSM. See ProcOps Service Machine.

PU. See physical unit.

R

RACF. See Resource Access Control Facility.

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 workstation from that user can log on to a domain from, that is, to the servers belonging to the domain, and use network resources. Users can access the shared resources and use the processing capability of the servers, thus reducing 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 Measurement Facility (RMF). A feature of z/OS that measures selected areas of system activity and presents the data collected in the format of printed reports, System Management Facility (SMF) records, or display reports.

Resource Object Data Manager (RODM). In NetView for z/OS, a component that provides an in-memory 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. Automation provided by SA z/OS 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 configuration file.

Restructured Extended Executor (REXX). A general-purpose, high-level, programming language, particularly suitable for EXEC procedures or programs for personal computing, used to write command lists.

return code. A code returned from a program used to influence the issuing of subsequent instructions.

REXX. See Restructured Extended Executor.

REXX procedure. A command list written with the Restructured Extended Executor (REXX), which is an interpretive language.

RMF. See Resource Measurement Facility.

RODM. See Resource Object Data Manager.

S

SAF. See Security Authorization Facility.

SA IOM. See System Automation for Integrated Operations Management.

SAplex. SAplex or "SA z/OS Subplex" is a term used in conjuction with a sysplex. In fact, a SAplex is a subset of a sysplex. However, it can also be a sysplex. For a detailed description, refer to "Using SA z/OS Subplexes" in *IBM Tivoli System Automation for z/OS Planning and Installation*.

SA z/OS. See 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 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. See status display facility.

SDLC. See synchronous data link control.

SDSF. See 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.

Security Authorization Facility (SAF). An MVS interface with which programs can communicate with an external security manager, such as RACF.

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 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 processor (SVP). The name given to a processor controller on smaller System/370 processors.

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). A set of protocols for monitoring systems and devices in complex networks. Information about managed devices is defined and stored in a Management Information Base (MIB).

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-MVS environment. An environment that supports one MVS image. See also MVS image.

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. See service language command.

SMP/E. See System Modification Program/Extended.

SNA. See 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. See Simple Network Management Protocol.

solicited message. An SA z/OS message that directly responds to a command. Contrast with unsolicited message.

SSCP. See system services control point.

SSI. See 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 that a subsystem or application is started.

status. The measure of the condition or availability of the resource.

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.

status focal-point system. See focal point system.

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.

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. See SAplex.

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 (SSI). 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. See service processor.

switch identifier. The switch device number (swchdevn), the logical switch number (LSN) and the switch name

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.

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. See 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 Integrated Operations Management. (1) An outboard automation solution for secure remote access to mainframe/distributed systems. Tivoli System Automation for Integrated Operations Management, previously Tivoli AF/REMOTE, allows users to manage mainframe and distributed systems from any location. (2) The full name for SA IOM.

System Automation for OS/390. The full name for SA OS/390, the predecessor to System Automation for z/OS.

System Automation for z/OS. The full name for SA 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.

System/390 microprocessor cluster. A configuration that consists of central processor complexes (CPCs) and may have one or more integrated coupling facilities.

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.

T

TAF. See 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 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.

Tivoli Workload Scheduler (TWS). A family of IBM licensed products that plan, execute and track jobs on several platforms and environments. The successor to OPC/A.

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. See 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. See 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. See Time-Sharing Option/Extended.

TWS. See Tivoli Workload Scheduler.

U

UCB. See unit control block.

unit control block (UCB). A control block in common storage that describes the characteristics of a particular I/O device on the operating system 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.

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.

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 Server. A logical construct that appears to comprise processor, memory, and I/O resources conforming to a particular architecture. A virtual server can support an operating system, associated middleware, and applications. A hypervisor creates and manages virtual servers.

Virtual Server Collection. A set of virtual servers that supports a workload. This set is not necessarily static. The constituents of the collection at any given point are determined by virtual servers involved in supporting the workload at that time.

virtual Server Image. A package containing metadata that describes the system requirements, virtual storage drives, and any goals and constraints for the virtual machine {for example, isolation and availability). The Open Virtual Machine Format (OVF) is a Distributed Management Task Force (DMTF) standard that describes a packaging format for virtual server images.

Virtual Server Image Capture. The ability to store metadata and disk images of an existing virtual server. The metadata describes the virtual server storage, network needs, goals and constraints. The captured information is stored as a virtual server image that can be referenced and used to create and deploy other similar images.

Virtual Server Image Clone. The ability to create an identical copy (clone) of a virtual server image that can be used to create a new similar virtual server.

Virtual Storage Extended (VSE). A system that consists of a basic operating system (VSE/Advanced Functions), and any IBM supplied and user-written programs required to meet the data processing needs of a user. VSE and the hardware that it controls form a complete computing system. Its current version is called VSE/ESA.

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 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.

VM/ESA. Virtual Machine/Enterprise Systems Architecture. Its current version is called z/VM.

volume. A direct access storage device (DASD) volume or a tape volume that serves a system in an SA z/OS enterprise.

VSE. See Virtual Storage Extended.

VTAM. See 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.

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. See write-to-operator.

WTOR. See 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. See 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. See extended recovery facility.

Z

z/OS. An IBM mainframe operating system that uses 64-bit real storage. See also Base Control Program.

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.

z196. See IBM Enterprise 196 (z196).

zAAP. See IBM System z Application Assist Processor (zAAP).

zBX. See IBM zEnterprise BladeCenter Extension (zBX).

zBX blade. See IBM zEnterprise BladeCenter Extension (zBX) blade.

zCPC. The physical collection of main storage, central processors, timers, and channels within a zEnterprise mainframe. Although this collection of hardware resources is part of the larger zEnterprise central processor complex, you can apply energy management policies to zCPC that are different from those that you apply to any attached IBM zEnterprise BladeCenter Extension (zBX) or blades. See also central processor complex.

zIIP. See IBM System z Integrated Information Processor (zIIP).

zEnterprise. See IBM zEnterprise System (zEnterprise).

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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