CA SOLVE:Operations® Automation

Reference Guide

Release 11.9

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- CA Datacom® (CA Datacom)
- CA Mainframe Connector for Linux on System z (CA Mainframe Connector)
- CA Mainframe Software Manager™ (CA MSM)
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Contents

Chapter 1: Introduction

This section contains the following topics:

Intended Audience

This guide is intended for technical personnel responsible for the planning and maintenance of your product's functions and services. It contains information about the advanced functionality of your product.

Typographic Conventions

This table explains the conventions used when referring to various types of commands and when indicating field attributes.

Convention	Description
Commands	Commands such as SYSPARM and SHUTDOWN are shown in uppercase.
User Entries	Information to enter onto panels is displayed in **bold** text.
Cross-References	Cross-reference links to other sections of the book are displayed as underlined blue text.
Shortcuts	Shortcuts to menus or options are displayed in **bold**, for example, **/PARMS**.

Chapter 2: Advanced Customization Tasks

This section contains the following topics:

OCS Function Key Settings

The Operator Console Services (OCS) mode supports up to 24 function keys. You can customize these keys either locally or globally.

List Function Key Settings

You can list the current function key settings.

To list the settings, enter the **PF LIST** command.

Set Local Function Keys

You can customize the function keys of each OCS panel with the PF command. Function keys set from an OCS panel have the following characteristics:

- The keys apply to the requesting panel only.
- The keys are valid only until you exit from OCS.

Note: For information about the PF command, see the online help.

Example: Set F4 as a Conversational Function Key

To define F4 as a conversational function key, issue the following command:

```
PF4 CONV,MSG USER1
```

Set Global Function Keys

You can use the PF command to set the default or global values of the function keys that apply on initial entry to OCS. Function keys set in this way apply to all OCS panels unless overridden by a further PF command entered from OCS mode.

To set global function keys, execute the PF command in the BSYS environment (for example, in your INIT or READY procedures) or use the SUBMIT command to pass a PF command to the BSYS environment.

Note: For information about the PF command, see the online help.

Default OCS Function Key Settings

If no PF commands are included in your INIT procedure, the defaults in the following table apply:

Key	Command Issued	Type
F1/13	-FSPROC ##HELP	Prefix
F2/14	SPLIT	Immediate
F3/15	X	Immediate
F4/16	RETURN	Immediate
F5/17	-FSPROC $CMDENT+	Prefix
F6/18	AUTOHOLD	Immediate
F7/19	-FSPROC $LOBROW	Immediate
F8/20	CLEAR	Immediate
F9/21	SWAP	Immediate
F10/22	CS+	Immediate
F11/23	CS-	Immediate
F12/24	ORDER	Immediate

Note: For information about function key types, see the online help for the PF command.

Equate Command Strings

The EQUATES parameter group lets you substitute a long command string with a single one- to eight-character string. The string is then easier and faster to use. This is particularly useful when you are using Remote Operator Facility (ROF). You can also use the EQUATES parameter group to replace an existing command with a Network Control Language (NCL) procedure.

You can set up equates in the EQUATES parameter group when you first customize your region. These equates are then immediately available to any operator using OCS mode. These equates are known as global EQUATES.

Individual users can override a global equate by using the EQUATE command in OCS. Equate values set by an individual user are effective only for that user, and only for the single OCS session.

Note: For more information about the EQUATE command, see the online help.

Command Replacement After Exit Initialization

To substitute commands with NCL procedures after initialization, you can use either the CMDREPLS or EQUATES parameter group.

Note: Command replacement using the EQUATES parameter group takes effect during system initialization only.

Time-out Facility

You can set terminals that are logged onto an application to time out after a period of inactivity. This reduces the security risk of having them logged on but unattended.

A general time-out facility is provided in your product region. Use this to specify time-out intervals and actions for all terminals.

The time-out facility identifies a user at a terminal as having been inactive for a period and executes an action. Possible actions are to ring the terminal alarm, or to log the user off the system.

When time-out management is implemented, it affects all of the users of your region, unless their user ID definitions exempt them.

The TIMEOUT parameter group lets you administer the time-out facility. You can access parameter groups through the /PARMS panel shortcut.

National Language Character Set Support

Your product supports the use of National Language (NL) character sets. This support is automatic and is controlled by the SYSPARMS LANG command. The default is US; however, many different languages are supported.

Note: For more information about supported language codes and their associated code pages, see the *Network Control Language Reference Guide.*

You can set an individual language code for users in their user ID definitions.

Note: For information about how to specify a language code in a user ID, see the *Security Guide*.

Language codes can also be set in NDBs. These NDBs use the associated code page to perform uppercase folding for storing and searching fields. If the specified language code is not supported, the system code, as set by the SYSPARMS LANG command, is used.

What National Language Support Affects

The following functions perform language support translation using the code page associated with a user's language code:

- NCL panel processing using #FLD CAPS=YES
- NCL statements using the &TRANS built-in function with the NLUPPER and NLLOWER operands

The following functions perform language support translation using the code page associated with the NDB:

&NDBSCAN

Scan expressions, which require data to be folded for CAPS=SEARCH fields, use the code page of the NDB.

&NDBADD

Fields use the code page of the NDB.

&NDBPUT

When these statements add data to fields defined as CAPS=YES, the translation is performed using the code page associated with the NDB.

A User's Language Code

The &ZUSERSLC system variable returns the system recognized language code for a user. This is one of the following values:

- The user's language code
- The system language code if the user's language code is not valid
- The value UK if the system language code is not a supported code

Provide a Customized Primary Menu

If you want to customize the primary menu for your installation, you must understand how the supplied primary menu procedure works.

Note: If you want to customize the supplied procedure, ensure that you rigorously test any changes for all user classes before implementing the new procedure.

To provide a customized primary menu, specify the name of the new procedure in the PMENUCONTROL parameter group.

Supplied Primary Menu Procedure

The primary menu procedure provides an entry point for every user and provides an appropriate selection list of functions for the users of your system.

The name of the supplied primary menu procedure is $NMPMENU. This procedure is invoked by the system to perform system checks and then invokes the procedure, $NMPEXIT, to perform the presentation of the menu.

Both $NMPMENU and $NMPEXIT are standard NCL procedures and are invoked according to each user's NCL library specification.

The primary menu procedure is invoked under the following conditions:

- After initial logon
- At the termination of an OCS or MAI session
- If the procedure terminated without specifying a mode change or window termination

Expired Password Procedure

$NMPMENU must be able to detect when a user's password has expired. The &ZPWSTAT system variable is used for this purpose. The variable invokes the $UAPWD01 procedure to prompt for password change. Make sure that this facility is available if you customize the supplied procedure.

Reconnection Menu

$NMPMENU supplies a reconnection menu, providing multiple-signon users with the following choices of reconnection options after a session outage:

- Reconnect to a particular region
- Bypass reconnection and display the primary menu
- Bypass reconnection and cancel all disconnected regions

Primary Menu Display

$NMPEXIT is invoked by $NMPMENU to display the primary menu. The menu panel has the following features:

- Fixed title line
- Input option line
- Error message line
- Floating trailer containing the menu broadcast and available function keys
- 55 lines available for menu selections
- A user information box on the right hand side

A maximum of 12 menu options can be displayed on the menu at one time. The format and number of these selections should be displayable on all devices supported by your installation's network.

$NMPEXIT uses the security query capability of &SECCALL to determine users' authorized privileges. It then matches this profile to determine which features they are authorized to access, and displays only these features on the menu.

Primary Environment Modes

When the primary menu is displayed, the primary environment is operating in base NCL mode. There are two other modes of primary environment:

- OCS
- MAI-FS

These modes are invoked when the primary menu procedure issues a SETMODE command to modify the primary environment. When these alternate modes are terminated, the primary environment returns to base NCL mode.

For example, if a user is authorized to access OCS and enters the O option on the primary menu, OCS is invoked using the SETMODE OCS command. This alters the primary environment so that it operates in OCS mode. When users exit OCS, they are returned to the primary menu, and the primary environment operates in base NCL mode.

Support for Single Option Users

If a user is only authorized for one option on the primary menu, the primary menu procedure can detect this situation and will automatically select that option and display the menu for that option. For example, if a user is only authorized for OCS, the primary menu procedure will bypass the primary menu and change to OCS mode automatically. When the user exits the option, the session is closed without displaying the primary menu.

Chapter 3: Initializing Your Region Using the SOLVE Program

This section contains the following topics:

About SOLVE

SOLVE is a program that lets you do the following:

- Circumvent the 100-character JCL parameter limit.
- Start a region before JES without cataloging data sets in the master catalog.
- Use the MVS system symbol substitution service in a control file to tailor program parameters. This aids in cloning systems in a sysplex environment.

The SOLVE program is supplied in object code.

How SOLVE Processing Works

The SOLVE program processes in the following sequence:

1. The NMDRVCTL data set (the control file) opens.
2. Input commands are read and processed.
3. The NMDRVCTL data set closes.
4. If no errors are detected, control is transferred to the target program (using XCTL), passing the input JCL PARM as prefixed, suffixed, or both.

If errors are detected in the input commands or if a dynamic allocation error occurs, the error message is written to the console as a WTO message and the action specified by the ERROR command is taken. The target program is not started in this case.

NMDRVCTL Data Set

When SOLVE executes, it opens and reads the data set associated with the NMDRVCTL ddname to obtain parameters. This section describes how to specify the contents of NMDRVCTL.

The NMDRVCTL DD statement points to the data set that contains control statements for SOLVE. These control statements specify:

- SOLVE options
- PARM information for the target program
- Data set or SYSOUT allocation requests

The data set must have the following attributes:

- Fixed (blocked or unblocked)
- LRECL 80
- Any valid block size

The data set can be sequential or a partitioned data set (PDS) member, or a concatenation of these. For example, it can be a member in SYS1.PARMLIB.

The control statements must be in the following format:

- All control statements must be in uppercase.
- Only columns 1 through 72 are examined. If line numbers are desired, they can be in columns 73 through 80.
- Blank lines are ignored.
- Any line with an asterisk (*) as the first non-blank character is treated as a comment and ignored.
- Other lines must contain valid SOLVE commands (see the following section for details of these commands).

  Only one command is allowed per line. Commas can separate the operands of a command. Comments can trail on the lines if they are separated from the commands and operands by a blank.
- The commands for data set and SYSOUT allocation can span several lines. In this case, the plus sign can be used as a parameter to indicate that the next line is a continuation of the current command.

SOLVE Commands

The SOLVE program has three groups of commands:

- General
- The dynamic allocation of data sets
- The dynamic allocation of SYSOUT data sets

General Commands

The following general commands can be specified in the NMDRVCTL data set:

PGM={ NM001 | *name* }

Specifies the target program to which control is transferred.

Default: NM001

ERROR={ *tnnnn* | R100 }

Specifies the action to take if an error is detected in the input control statements. The following actions are valid:

R*nnnn*

Returns to the system with *nnnn* return code.

U*nnnn*

Abends with user ABEND code *nnnn*.

Default: R100

PARMSEP=*c*

Specifies the separator character for concatenation of PARM information. The nominated character is used only between the PARM prefix (see the PPREF command), the JCL PARM, and the PARM suffix (see the PSUFF command). The character is not used between individual sections of the prefix and/or suffix.

Default: comma (,)

PPREF=*value*

Specifies the prefix of the supplied JCL parameters (see page 245) that is passed to the target program. This command must not span lines, but can be specified several times. The multiple specifications are concatenated together, in appearance order, with no intervening separators, and treated as a single prefix.

Limits: 1024 characters

PSUFF=*value*

Specifies the suffix of the supplied JCL parameters that is passed to the target program. This command must not span lines, but can be specified several times. The multiple specifications are concatenated together, in appearance order, with no intervening separators, and treated as a single suffix.

Limits: 1024 characters

LIST={ NO | YES }

Controls the listing of input lines. If LIST=YES is specified, all following lines are listed to the console using WTO messages. If SUBS=YES is in effect, each line is also displayed after substitution processing.

SUBS={ NO | YES }

Controls symbolic substitution for line processing. Specifying SUBS=YES enables substitution on all following input lines (except comments).

Specifying SUBS=NO stops substitution on all following input lines.

VAR*xxx*=’*value*’

Lets you define up to 20 additional user variables for substitution. *xxx* is the variable name, and the value is specified after the equal sign (=), which can be quoted if containing blanks. Each variable name can have up to 16 characters.

If substitution is in effect, the variable name and value can be built from other variables.

Note: The value length cannot exceed the length of the actual variable name + 1 (for an ampersand). The symbol substitution service enforces this rule to prevent buffer overruns.

WAIT={ ESM | VTAM }

Specifies whether initialization waits for the External Security Manager (ESM) or VTAM to become available.

DD Command—Allocate a Data Set Dynamically

The DD command allocates a data set dynamically.

This command has the following format:

```
DD=name | DD=*
[ ,DSN=datasetname ]
[ ,DISP=( { OLD | SHR | MOD | NEW } [ ,ndisp ] [ ,cdisp ] ] ) ]
[ ,VOL=volume ]
[ ,UNIT=unitname ]
[ ,{ CYL=( pri,sec ) | TRK=( pri,sec ) } ]
[ ,BLKSIZE=nnnnn ]
```

If the operands cannot fit on one line, you can use the plus sign (+) to indicate that the command is continued. For example:

```
DD=FRED,+
   DSN=FRED.DATASET,+
   DISP=OLD
```

DD=*name* | DD=*

Specifies the ddname being allocated. This operand must be first, and a valid ddname must be used. DD=* dynamically concatenates this data set to the previous data set allocation (which must be a data set, not a SYSOUT allocation).

DSN=*datasetname*

Specifies the data set to be allocated. A PDS member name or GDG relative generation number can be specified in parenthesis after the data set name.

DISP=({ OLD | SHR | MOD | NEW } [,*ndisp* [,*cdisp*]])

Specifies the data set disposition. *ndisp* and *cdisp* are the standard UNCATLG, CATLG, DELETE, and KEEP options and default as in standard JCL. If only the first disposition is required, no parentheses are necessary. For example:

```
DISP=OLD
```

VOL=*volume*

Specifies the volume that the data set is (to be) on. For existing data sets, the operand bypasses a catalog search. Generally, also specify the UNIT operand.

UNIT=*unitname*

Specifies the unit type that the data set is (to be) on. This operand is required for existing data sets if the volume is specified.

CYL=(*pri*,*sec*) | TRK=(*pri*,*sec*)

For new data sets, allows specification of a space allocation value.

Note: You cannot allocate a PDS because no directory amount can be specified.

BLKSIZE=*nnnnn*

Lets you specify a block size. This operand is also useful when concatenating data sets of unlike block size because it sets the DCB BUFLEN value.

DD Command—Allocate a SYSOUT Data Set Dynamically

The DD command can allocate a SYSOUT data set dynamically.

This command has the following format:

```
DD=name,
   SYSOUT=([class] [,writer_name] [,form_name])
 [,FREE={ CLOSE | END }]
 [,HOLD={ NO | YES }]
 [,BLKSIZE=nnnnn]
```

If the operands do not fit on one line, you can use the plus sign (+) to indicate that the command is continued. For example:

```
DD=LOG1,+
   SYSOUT=A,+
   FREE=END
```

DD=*name*

Specifies the ddname being allocated. A valid ddname must be used.

SYSOUT=([*class*] [,*writer_name*] [,*form_name*])

Specifies the following parameters of the system output data set:

class

Specifies the SYSOUT class desired. Use a single letter or number, A through Z or 0 through 9. Specifying an asterisk uses the job MSGCLASS (as in JCL).

writer_name

Specifies the name of an external writer to process the data set instead of JES.

form_name

Specifies the name of a form on which the data set is printed.

FREE={ CLOSE | END }

CLOSE specifies that the SYSOUT is to be spun-off when closed; END specifies that it is not. *Do not* use FREE=CLOSE for FMTDUMP.

Default: CLOSE

HOLD={ NO | YES }

Specifies whether the SYSOUT is to be held.

Default: NO

BLKSIZE=*nnnnn*

Lets you specify a block size.

Chapter 4: Tuning Performance

This section contains the following topics:

Performance Enhancement

You can enhance the performance of your regions at each of the following levels:

- System
- Product
- Function

By following the performance enhancement measures outlined in these topics, you will achieve the most effective use of your product.

System-level Tuning

The first area to consider when tuning your region is at the system level. The following points outline system level performance considerations:

- For z/OS systems, the performance group and dispatching priority can affect the performance of your region. High-priority systems should be in the same domain as VTAM and just below it in dispatching priority.
- In terms of tuning, your product can be regarded as equivalent to CICS or IMS. All system tuning rules that apply to other online systems should be used with these systems to ensure that your product region is not starved for real storage.
- Data set placement is important to consider when increasing the performance of your system. The PANELS, MODS, and NCL COMMANDS data sets can have a large amount of I/O activity on them. For this reason, consider placing these data sets on volumes and paths that are not otherwise busy.
- Running your product region as non-swappable can help to increase response time, which is important when the overall activity rate is low but quick response is important. The NONSWAP parameter group is used to specify whether your product region is non-swappable (the default).

Note: Some products must run non-swappable.

VTAM Interface Tuning

To help ensure that you gain maximum effectiveness from your products, consider the following performance points for your VTAM interface:

- Review any pacing specifications in System Services APPL statement parameters. They could affect INMC performance.
- If INMC is implemented using VTAM, dedicated COS definitions can be specified to optimize paths through the network (for multi-region environments only).

Important! Do not use the Alias Name Translation facility unless you have to. Using this facility means taking the TR-INQ RU code X‘3F0814’ out of the CNM routing table, and therefore prevents VTAM from requesting redundant name translations.

Panel Use Tuning

In some products, a large number of panels may need to be displayed. These panels are stored on VSAM data sets. Panels are retrieved from these data sets as required. Panel definitions are retained in storage for both reuse and automatic sharing.

Storage Limits for Panel Sends

The maximum amount of storage allocated to allow panels to be sent to terminals is crucial to the performance of your region and is separate to considerations for tuning panel access. The following two SYSPARMS operands are used to specify storage amounts:

PANLBFSZ

Sets the amount of storage to be acquired to build a panel data stream.

Default: 20 KB

PANLBUFF

Sets the maximum number of pages of storage to be allowed for panel buffers

To avoid severe response time problems when you have a large number of application users, increase the value of the PANLBUFF operand. Otherwise, when a user requests a panel, they might have to wait until a previous panel send has been completed before they have access to their panel.

To monitor how your region performs panel sends, use the SHOW GRP=PBUFPGT command. This command shows statistics about the panel buffer storage pool and can help you determine whether delays are being caused by panel send throttling.

The reason that the current storage utilization may be close to, or above, the defined maximum storage, is that some of the terminals that have had panels sent to them have not returned a definite response. This causes unnecessary throttling of panel send operations.

The region automatically increases the limit temporarily if the condition persists and returns the limit to its original value when the condition is relieved. This does not alter the short-term throttling characteristic, which is used to prevent flooding of the network and VTAM.

Note: You can alter the throttling characteristics dynamically by issuing the SYSPARMS PANLBUFF command to increase or decrease the active panel send limit. For example, to minimize the effect of panel sends not completing, you could increase the panel send limit after EASINET startup.

More information:

SYSPARMS Operands (see page 257)

NCL Procedure Usage

With some products or user-written applications, a concern may be the rate at which NCL procedures are loaded into storage. Modular programming practices encourage breaking an application into as many separate small modules as possible. This leads to many loading requests for procedures issued as NCL executes.

If this is not addressed, the following problems can occur:

- Applications run slowly, as they are constantly waiting for procedures to load. This is particularly evident in some applications that call a procedure to edit each field on a panel.
- I/O to the NCL procedure libraries can be a bottleneck.
- CPU time is expended in loading and precompiling the NCL.
- Real storage is tied up for I/O buffers.

NCL Procedure Loading Activity

To monitor the loading of NCL procedures for your system, use the SHOW NCLSTAT command. This command displays statistics about the number of:

- Load requests
- Actual loads
- Loads satisfied by preload
- Loads satisfied by autoshare and retain

By monitoring the increase in the value of these statistics across the day, you can use the following techniques to help strike a balance between loading activity and storage use:

- Sharing NCL procedures between users
- Preloading NCL procedures

Preloaded NCL Procedures

You can nominate a set of NCL procedures to remain preloaded by using the OCS command, LOAD. This involves a once-only load and precompilation. These procedures can then be shared by any number of users. Preloading NCL procedures is useful when you have short routines that are typically used by a single user (no concurrent usage). These procedures are constantly flushed from storage and reloaded again. It is also best to specify any heavily-used NCL procedures to be preloaded.

Note: For information about the LOAD command, see the online help.

VSAM Data Set Tuning

Most of these products rely on VSAM UDBs and NDBs. The way you manage your VSAM data sets has a direct effect on the performance of your products. The facilities described in the following sections allow you to tune UDBs and NDBs for maximum performance benefits.

Buffer Sharing

Buffer sharing is controlled by the VSAM LSR (Local Shared Resources) facility. By sharing buffers, data set I/O is reduced. The shared buffers are defined in LSR in pools.

To enable buffer sharing for a VSAM data set, use the UDBCTL OPEN command with the LSR operand.

Note: For files allocated through Customizer parameter groups, you can enter UDBCTL operands as VSAM options. For more information about the UDBCTL command, see the online help.

When specifying the LSR pool definition that best suits your needs, consider the following factors:

- Your need for virtual storage versus I/O performance
- The mix of VSAM files that you have open concurrently in the address space and which of those you want to place in the LSR pool

To define your LSR pool definitions, use the LSRPOOL parameter group (enter **/PARMS**).

Note: VSAM alerts (see page 42) warn about string or buffer shortages.

Deferred Write Capabilities

Deferred write capabilities let you defer the updating of data sets so there are fewer I/O requests. Weigh the advantages of using this facility against the possibility of losing data in the event of a system failure.

To allow a data set to have deferred write capabilities, specify the DEFER operand on the UDBCTL OPEN command, or VSAM options in a Customizer parameter group.

Note: For more information about the UDBCTL command, see the online help.

VSAM Processing in a Subtask

You can nominate VSAM I/O to be performed by a subtask rather than the System Services main task. This provides increased throughput by overlapping VSAM processing. To nominate a subtask to perform VSAM I/O, use the VSAMIO JCL parameter.

Note: Using a subtask is only useful when there is significant VSAM processing and you have a multi-CPU machine.

You can use the SHOW VSAMIO command to obtain statistics of VSAM processing.

Example

Following is an example of SHOW VSAMIO command output:

```
(18.51)---------------- Operator Console Services (OCS) ----------------------
show vsamio
N13A10 VSAM I/O MANAGER STATISTICS.
N13A11 MODE: DYNAMIC MOLAP: 20 MBPWAIT: 5 DSTS: 2 DSTM: 0 REQS: 173K
N13A12 TASK REQUESTS COL POL TIMES-POL NOWAIT PSWAIT PENDING
N13A13 MAIN 133K 0 2 1229 111K 11107 -
N13A13 SUB 39491 0 5 1 37542 - 0
N13A14 OLAP M/T S/T
N13A15 0 0 7300
N13A15 1 21145 1448
N13A15 2 1229 237
N13A15 3 0 22
N13A15 4 0 2
N13A15 5 0 1
N11907 *END*

==> show vsamio
```

More information:

Product Region JCL Parameters (see page 245)

Record Size Management

When tuning the size of your databases, you need to consider the control interval size (CISIZE), maximum record size (RECSZ), and free space.

NDB database records should be tuned to fit into a single VSAM record.

Note: For information about the storage needed by an NDB record, see the *Network Control Language Programming Guide*. Use this information to choose a suitable CISIZE that gives good track utilization.

If the NDB is subject to heavy update activity, pick a reasonably large free space amount. This enables data and key record alterations in the NDB structure to take place without causing excessive numbers of CI/CA splits.

You should also regularly reorganize your databases using IBM's IDCAMS REPRO command.

Note: Currently, you cannot change the record size of an NDB without logically unloading and reloading it.

Exceptions

The following NDBs store historical records:

- Alert history ($ALERTH)
- File transfer events log (EVNTDB)

Because records are added and deleted in key sequence order, do *not* allocate free space for these NDBs. Also, do *not* reorganize them because the NDB feature, RIDREUSE, reclaims the space used by deleted records. You can monitor their sizes by defining VSAM alerts (see page 42) that are raised when a predetermined number of extents are allocated.

Database Activity Management

Database activity tuning applies to NDBs. Consider the following points when using NDBs to enhance performance:

- Open an NDB as a UDB by using the UDBCTL OPEN command with the LSR and DEFER options.
- Define the LSR pool with sufficient buffers of appropriate size for the NDB data set data and index.
- Check that SYSPARMS, NDBSUBMN, and NDBSUBMX values are adequate for the amount of concurrent SCAN activity that is occurring.
- Choose values for the NDB scan limit system parameters that stop users from running scans that consume excessive system resources.

Important! Do not use the DEFER option of the NDB START command unless you are bulk loading.

Customize VSAM Alerts

An alert is always raised when a file is full or an error condition occurs; however, you can modify the severity. You can also specify whether to raise an alert for VSAM file extensions, string and buffer shortages, and enable alerts when a UDB expands to a pre-defined number of extents. You can customize these conditions through the VSAMMONITOR Customizer parameter group.

To customize VSAM alerts

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups panel appears.

2. Enter **U** beside VSAMMONITOR in the Monitors category.

   The VSAMMONITOR Customizer panel appears.

3. Complete the fields.

   Note: For information about the fields, see the online help.

   a. (Optional) If you want to apply the changes immediately, press F6 (Action).

      The region takes on the changes.

   b. Press F3 (File).

      The changes are saved.

Performance Monitoring Facilities

The SHOW VSAM command is provided to display attributes and statistics about VSAM databases.

Example

Following is an example of a SHOW VSAM display.

```
(02.25)---------------- Operator Console Services (OCS) -----------------------
show vsam
N15101 DDNAME   RECSZ D-CISZ I-CISZ CI-SP CA-SP D-BF I-BF STRSH BFRSH LSR CTL
N13522 VFS       4089   8192   2048    75     0   10    9     0     0 NO  DSN
N13522 USERIDS   4000   4096   2048     0     0    4    5     0     0 NO  DSN
N13522 OSCNTL   32700  32768   4096    41    10    4    3     0     0 NO  DSN
N13522 NMLOG01   4089  22528   2048     2     0    0    0     0     0 YES DSN
N13522 NMLOG02   4089  22528   2048     0     0    0    0     0     0 YES DSN
N13522 NMLOG03   4089  22528   2048     0     0    0    0     0     0 YES DSN
N13522 MODSUSR   4096   8192   2048     0     0    0    0     0     0 YES DSN
N13522 MODSDIS   4096  16384   2048  1213    97    0    0     0     0 YES DSN
N13522 PANLUSR   8185   8192   2048     0     0    3    3     0     0 NO  DSN
N13522 PANLDIS   8185   8192   2048    70     9    3    3     0     0 NO  DSN
N13522 ICOPANL  16377  16384   2048     0     0    3    3     0     0 NO  DSN
N13522 ALERTH    8185  16384   4096     0     0    0    0     0     0 YES DSN
N13522 NETINF1   2048   4096   2048     0     0    0    0     0     0 YES DSN
N13522 PSPOOL     340   4096   4096     0     0    0    0     0     0 YES DSN
N13522 RAMDB     8185   8192   4096     6     0    0    0     0     0 YES DSN
N13522 RAMDBST    200   8192   4096     0     0    0    0     0     0 YES DSN
N13522 IPFILE    8185   8192   4096     0     0    0    0     0     0 YES DSN
N13522 IPMIBX    4089   4096   2048     0     0    0    0     0     0 YES DSN
N13522 IPLOG     4089   4096   4096     2     0    0    0     0     0  11 DSN

==> SHOW VSAM
```

LSR Tuning

To assist with specifying the LSR pool definitions that provide the best performance for your system, use the SHOW LSR command. This command displays statistics about the LSR pool. From this display you can note trends and alter the LSR pool definition appropriately.

Example

The following panel displays LSR pool statistics from a system that has been customized, and as a result has significantly more buffers than the distributed definition.

```
(23.01)---------------- Operator Console Services (OCS) ----------------------
SHOW LSR
N15A30 ACTIVE LSR POOL 0 STATISTICS
N15A31 KEYLEN: 255 STRNO: 220 FIXIOB: NO FIXBFR: NO STRMAX: 7 ACTIVE: 19
N15A32   SIZE COUNT  P. READS BUF FOUND       UIW      NUIW %FOUND  HS-COUNT
N15A33   2048   100     80758   1249419    169112         0  93.92
N15A33   4096   200       197    951843      6061         0  99.97
N15A33   8192    30      7346    393443      1884         0  98.16
N15A33  10240    20         0         0         0         0   0.00
N15A33  16384    20         0         0         0         0   0.00
N15A33  28672     6        22     27066       338         6  99.91
N15A30 ACTIVE LSR POOL 1 STATISTICS
N15A31 KEYLEN: 255 STRNO: 250 FIXIOB: NO FIXBFR: NO STRMAX: 1 ACTIVE: 1
N15A32   SIZE COUNT  P. READS BUF FOUND       UIW      NUIW %FOUND  HS-COUNT
N15A34 DATA...
N15A33   8192   500       413     42172       513         0  99.03        50
N15A35 INDEX...
N15A33   2048   100        11     85045         1         0  99.98
N15A30 ACTIVE LSR POOL 11 STATISTICS
N15A31 KEYLEN: 255 STRNO: 12 FIXIOB: NO FIXBFR: NO STRMAX: 1 ACTIVE: 1
N15A32   SIZE COUNT  P. READS BUF FOUND       UIW      NUIW %FOUND  HS-COUNT
N15A33   2048    40         6     15688        40         0  99.96

==> SHOW LSR
```

In this example, little use is being made of the 512-byte buffers. The sum of pool reads plus the number of buffers found is a small number. This small number is a sign that there are too many buffers in the pool. Deleting the pool might also be an option but could also be quite wasteful of storage as buffers from the next larger pool will then be used.

There is a low percentage of 12-KB and 16-KB pools found. This is an indication that the number of buffers could be increased for those pool sizes.

Data Set Activity Tuning

Use the SHOW NDB=ALL command to monitor the amount of concurrent SCAN activity that is occurring within your system. Then use the SYSPARMS, NDBSUBMN, and NDBSUBMX operands to tune activity appropriately.

Example

The following is an example of SHOW NDB=ALL command output.

```
(20.56)---------------- Operator Console Services (OCS) -----------------------
SHOW NDB=ALL
N89503 NAME     STATUS     QCMD  USERS CMDS-DONE SUBT QSUB DFR LSIZ LHWM TSILJR
N89504 RAMDB    ACTIVE        0      2       821    3    0 NO    40    4 NNNNNP
N89504 $ALERTH  ACTIVE        0      0         5    0    0 NO    40    1 NNNNNP
N89505 *END*
_______________________________________________________________________________

==> SHOW NDB=ALL
```

Communication Between Regions

Many sites make heavy use of INMC. By ensuring that your INMC links are running smoothly you can improve the performance of the facilities that rely heavily on INMC. The following features can be tuned to aid in the smooth communication between your domains using INMC:

- INMC
- ROF
- FTS
- ISR

INMC Tuning

You can tune INMC in the following areas:

- INMC buffer size—specified by the SYSPARMS INMCBFSZ operand
- BIND RUSIZE—specified in the logmode table definition

If you increase the INMCBFSZ value and the RUSIZE value is not at least this large, no benefits are derived.

You can also use logmodes with pacing turned on. This feature can prevent a VTAM link being overrun by INMC traffic.

More information:

SYSPARMS Operands (see page 257)

ROF Tuning

To prevent excessive message traffic from being sent across INMC links during ROF connections, the following techniques can be used:

- Always configure the remote user ID to receive only relevant message traffic.
- Avoid duplication of messages. Operators should only receive unsolicited messages in remote domains if they really need them.
- Consider signing on background regions across a ROF link. For example, if BMON is signed on to a remote domain, any messages it is eligible to receive from the remote domain can be processed by a MSGPROC in the receiving system, and then propagated to all MONITOR receivers in that system. Only one copy of the message flows across the link in this case.

  In this case, operators that need to issue commands to the remote domain do not need to be profiled to receive unsolicited message receipt.
- Consider using Inter-System Routing (ISR) facilities if applicable.
- Use the SIGNOFF command to terminate remote connections and free resources.

CA SOLVE:FTS Tuning

Note: The section applies only to CA SOLVE:FTS.

The performance of CA SOLVE:FTS is influenced by the following external factors:

- The block sizes of the transmitted data sets
- INMC tuning
- The speed at which data can be transmitted. Consider the INMC feature which can make use of multiple parallel paths between two domains. For example, create INMC-specific logmodes which have COS definitions that traverse different links at different priorities.
- Priority of File Transmission Services traffic. File Transmission Services has the lowest INMC priority. This is not adjustable.

The only internal tuning that can be performed in CA SOLVE:FTS is to limit the number of initiators for a specific destination to prevent excessive resource commitment. This can be done by the CA SOLVE:FTS initiator function or through the FTSINIT command.

Note: For more information about the FTSINIT command, see the online help.

ISR Tuning

When using ISR, carefully consider the types of data that are to be sent across an INMC link. To monitor ISR data exchange, use the SHOW ISRSTATS command to obtain statistics.

Message Flow in OCS

To ensure that OCS activity impedes the performance of your systems as little as possible, the following points should be considered:

- Restrict the types of messages that an operator receives using UAMS or an external security definition.
- Do not allow all operators to receive unsolicited messages by default.
- Use MSGPROCs. Held message limits can be reached while the panels are being displayed. If messages are not going to be examined, they should not be sent. These messages waste storage space and CPU time.
- Restrict the use of non-roll delete (NRD) messages. Extra system resources are needed to retain NRD messages.
- Encourage the use of selective commands. Monitor the use of $CMDENT. If excessive, perhaps the default wrap count should be lowered.
- Use the SYSPARMS HELDMSG=*xxx*,*yyy* command to limit the hold message queue. The queuing of messages causes excessive storage usage and fragmentation.

Performance Considerations When Writing NCL

When writing NCL, the following points should be considered to ensure that your system performance does not suffer:

- Ensure that the &CONTROL RESCAN option is only used around statements to which it applies. Rescanning every NCL statement slows the system down.
- Use suppressed comments because they occupy no storage. They add an insignificant overhead to the procedure load process only.
- Use modular programming.
- Use the NCLTEST command when testing NCL to circumvent the retain and autoshare facility.
- Do not use static and dynamic PREPARSE facilities for panels unless they are essential to a specific panel display.
- In any NCL procedures that display panels, think about the number of variables that are active across any panel displays. The large number of concurrent processes executing can result in excessive virtual storage usage. Comment out any unneeded variables before any of these displays.
- Reduce the overheads of using &CALL repeatedly to call a module by using one of the following methods:
  - Use the LOAD MOD=*module_name* command, if the module is reentrant, to load it once into storage.
  - Use the SUBSYS facility to attach the program once.

More information:

NCL Procedure Usage (see page 38)

Commands to Control Resource Consumption by NCL

There are several commands that can be used to alter the performance of your region. These system performance commands include SYSPGT (see page 57), SYSRCT (see page 57), SHOW SYSWAIT (see page 55), SHOW SYSPGT (see page 50), and SHOW SYSRCT (see page 52). These commands display and control resource consumption by NCL processes.

All NCL statements are assigned a processing unit weighting. SYSRCT and SYSPGT commands let you set up performance groups whereby an NCL process is placed into a forced wait if it consumes a certain amount of these processing units. This allows System Services to run with a high priority in the operating system, but prevents them from using all available CPU time if an NCL procedure starts looping.

System-level procedures should have a high priority. Short-term performance controls can be used to stop a runaway system procedure without impacting it in the long term.

The SHOW NCL command can also be used to indicate the performance group, priority, and current processing unit consumption. For more information about the SHOW NCL command, see the online help.

Important! Busy system procedures that do not wait because there is always a message available for &*xxx*READ may be unfairly penalized by the short-term performance control. These should be reset using the following command:

```
SYSRCT G=4 P=0 SDELAY=(0,0,0,0)
```

Performance and Tuning Commands

The following commands set the performance parameters of the different categories of process that your region executes. The commands also display the relative activity in a region.

The default settings are designed to cater for most installation requirements, but these commands are available to change the defaults if necessary.

Important! These commands should be used with caution by skilled system administrators.

SHOW SYSPGT Command—Display NCL System Performance Group Tables

The SHOW SYSPGT command displays the summary information about the NCL system performance group tables.

The system performance group table contains historical statistics about each of the four performance groups. The table also contains the priority that is given to NCL procedures when they start executing under the control of a particular group. The statistics show the number of currently active procedures, the total started and totals of performance control actions taken for each group.

This command has the following format:

```
SHOW SYSPGT
```

Example: Display Summary Information

```
SHOW SYSPGT
N58013 PG--IPRTY-ACTV-UPDATED---STARTED---DELAYS----CPRTY
N58004  1    1      3 14.42.05       13        0        0 BACKGROUND
N58004  2    1      2 14.42.05      121       17        3 OCS
N58004  3    2      0 14.42.05        3        0        0 FULLSCREEN
N58004  4    1     57 14.42.05     2288       54       24 SYSTEM
N13503 *END*
```

Return Information

PG

Displays the performance group number.

IPRTY

Displays the priority that is assigned to a procedure when it starts executing.

ACTV

Displays the number of currently active procedures.

UPDATED

Displays the time RCT control values were set. Initially, these values are set during system startup.

STARTED

Displays the total number of procedures that have run in this performance group.

DELAYS

Displays the total number of forced waits that have occurred for all procedures that have run in this performance group.

CPRTY

Displays the total number of priority changes that have occurred for all procedures that have run in this performance group.

text

Displays the descriptive name of the performance group.

Performance Groups

BACKGROUND

Identifies the group for procedures that execute without a physical terminal environment: BGMON and BGLOG.

OCS

Identifies the group for line mode procedures executing in association with a real OCS window, including commands from ROF sessions.

FULLSCREEN

Identifies the group for procedures that use panel services, including EASINET.

SYSTEM

Identifies the group for system-level procedures (BSYS, PPOPROC, CNMPROC, LOGPROC, and AOMPROC), RMINIT and RMREADY procedures, and CA SOLVE:FTS commands.

SHOW SYSRCT Command—Display NCL Performance Groups

The SHOW SYSRCT command displays summary or detail information about NCL performance groups. You can use the command to obtain either summary information about all four NCL performance groups or detailed statistics about a specific NCL performance group.

This command has the following format:

```
SHOW SYSRCT[ =SUMMARY | =n ]
```

=SUMMARY

(Default) Displays a single line for each performance group.

=n

Displays detailed information about the nominated performance group with all priority levels.

The Resource Control Table contains controls for dynamically altering the performance of currently active NCL procedures based on their consumption of *processing units* and statistics recording their effects.

Each priority in a performance group has short term and long-term controls. Short-term controls apply to processing units consumed since the last voluntary loss of control, for example, an &PANEL statement. Long-term controls apply to processing units consumed since the procedure was initiated.

The four performance groups are BACKGROUND, OCS, FULLSCREEN, and SYSTEM, numbered 1 through 4 respectively.

Each performance group has an initial priority which can be displayed using the SHOW SYSPGT command. In the detailed display of the resource controls for a particular group (that is, SHOW SYSRCT=*n*), the initial priority is indicated by <=I=.

Example: Display Detail Information

```
SHOW SYSRCT=4
N58007 PERFORMANCE GROUP 4, SYSTEM , 1430 STARTED SINCE - 14.42.05
N58008 PRIORITY+--TRIGGERS-+-------CONTROLS-------+--------STATISTICS-------+
N58009   3      DELAY CPRTY INIT. ADJ. LIMIT NPRTY DELAYS  LIMIT  CPRTY   ACT
N58010 SHORT      -     -     0    0     0    3        -      -      -     0
N58011 LONG       -     -     0    0     0    3        -      -      -
N58009   2
N58010 SHORT      -     -     0    0     0    2        -      -      -     0
N58011 LONG       -     -     0    0     0    2        -      -      -
N58009   1 <=I=
N58010 SHORT     20    10    50    0    50    0        0      0      0    54
N58011 LONG       -    80     0    0     0    0        -      -     13
N58009   0
N58010 SHORT     20     -    50    0    50    0        0      0      -     3
N58011 LONG       -    80     0    0     0    1        -      -     10
N13503 *END*
```

Return Information

PG

Displays the performance group number.

ACTV

Displays the number of currently active procedures.

INTERVAL

The statistics recording start time.

STARTED

Displays the total number of procedures that have run in this performance group.

DELAYS

Displays the total number of forced waits that have occurred for all procedures that have run in this performance group.

LIMIT

The total number of times that a forced wait has been issued for the maximum or minimum duration.

CPRTY

Displays the total number of priority changes that have occurred for all procedures that have run in this performance group.

Detail Information

The detail information returned includes the previous statistics for long-term and short-term performance control measures, and the following performance control settings for priorities and forcing procedures to wait:

DELAY

Displays the number of processing units that can be consumed by a procedure before a forced wait occurs.

CPRTY

Displays the number of processing units that can be consumed by a procedure before a priority change occurs.

INIT

Displays the length of time in hundredths of a second that a procedure is delayed for, after consuming the DELAY number of processing units for the first time.

ADJ

Displays the length of time in hundredths of a second that the initial DELAY is adjusted by for subsequent times that the delay number of processing units is consumed.

LIMIT

Displays the maximum or minimum length of time a procedure is forced to wait.

NPRTY

Displays the new priority that is assigned to a procedure when it has consumed the CPRTY number of processing units.

SHOW SYSWAIT Command—Display Wait Statistics

The SHOW SYSWAIT command displays main task apparent wait statistics.

The system maintains wait statistics each time an operating system WAIT is issued. The information returned by this command includes the following statistics:

- Percentage of elapsed time that your product region is in an operating system wait (AWAIT%)
- Percentage of times a wait occurred when an NCL procedure was forced to wait due to performance controls (FWAIT%).

These statistics can be used as a guide to how busy the system is and whether performance control measures are having an overall effect.

This command has the following format:

```
SHOW SYSWAIT
```

Use SYSWAIT statistics as a guide only because they reflect the voluntary loss of control of your product region and do not reflect operating system resource management activity.

The statistics are maintained on a historical and interval basis. The first line of the two detail lines shows the statistics since this command was last issued. The second detail line shows the long-term accumulation. These statistics are reset at midnight. Each time this command is issued, the current statistics for this interval are rolled over into the historical statistics. This feature provides a means for displaying activity in the short term, compared against the long-term average.

AWAIT% reflects the apparent wait time that control has voluntarily been passed to the operating system. Therefore, the actual wait time could be higher, because of page faults, higher priority work, and so on.

The number of times that at least one NCL process was forced idle when a wait was issued is also shown as the FWAIT count. This count indicates that work could have been done, but performance controls forced all ready NCL processes to wait.

Example: Display Wait Statistics

```
SHOW SYSWAIT
N58001 PERIOD START:   AWAITS   FWAITS   FWAIT%   AWAIT%     RATIO
N58002   14.30.04      135385     3558    2.62%   99.36%         2
N58002   14.30.04      135385     3558    2.62%   99.36%         2
N58020 PERIOD START:    TOTAL-CPU %-BSY
N58021                 SYSTEM-CPU %-SYS  ACCNTED-CPU %-ACC UNACCNTD-CPU %-UNA
N58022   14.30.04      140.173343   0.6
N58023                   3.118633   2.2   137.047259  97.7     0.007450   0.0
N58022   14.30.04      140.173343   0.6
N58023                   3.118633   2.2   137.047259  97.7     0.007450   0.0
N13503 *END*
```

Return Information

START

Displays the start time for statistics accumulation.

AWAITS

Displays the number of operating system waits that have occurred since the start time.

FWAITS

Displays the number of FWAITS that took place when an NCL procedure was in a forced wait due to performance control measures.

FWAIT%

Displays the percentage ratio FWAITS is to AWAITS.

AWAIT%

Displays the percentage of elapsed time that the system was in an operating system wait.

RATIO

Displays the number of interval events processed per AWAIT.

SYSPGT Command—Set Initial Priority for NCL Performance Group

The SYSPGT command is used to set the initial priority for an NCL performance group. You use the command as part of performance control. The command sets the priority that is assigned initially to procedures running in a performance group.

This command has the following format:

```
SYSPGT GROUP=n
       IPRTY=p
```

GROUP=*n*

Specifies the number of the performance group that is to have its initial priority set.

Limits: 1 through 4

IPRTY=*p*

Specifies the initial priority for the specified performance group. Zero is the lowest priority.

Limits: 0 through 3

You can use the SHOW SYSPGT command to determine the default initial priority for all performance groups.

The four performance groups are BACKGROUND, OCS, FULLSCREEN and SYSTEM, numbered 1 to 4, respectively.

A procedure can have its priority altered during execution depending on control values set in the Resource Control Table (see page 57).

Examples: Set Priorities

```
SYSPGT G=1 IP=1
SYSPGT GROUP=4 IPRTY=3
SYSPGT GR=2 I=2
```

SYSRCT Command—Control Performance

The SYSRCT command is used to set performance control parameters in the system Resource Control Table (RCT). It is used for performance control. It can be used to set *processing unit* trigger values and performance control parameters. The following types of performance control measure are supported:

- A priority change control measure
- A forced wait control measure

Performance is calculated in the following ways:

- Short-term—that is, between voluntary waits, for example, screen interaction. The SDELAY and SNPRTY operands are used for short-term evaluation.
- Long-term—that is, for the *life* of the NCL process. The LDELAY and LNPRTY operands are used for long-term evaluation.

This command has the following format:

```
SYSRCT GROUP=n
       PRIORITY=p
     [ LDELAY=( [ trigger ], [ initial ], [ adjustment ], [ limit ] ) ]
     [ SDELAY=( [ trigger ], [ initial ], [ adjustment ], [ limit ] ) ]
     [ LNPRTY=( [ trigger ], [ new_priority ] ) ]
     [ SNPRTY=( [ trigger ], [ new_priority ] ) ]
```

GROUP=*n*

Specifies the number of the performance group that is to have its RCT values updated.

Limits: 1 through 4

PRIORITY=*p*

Specifies the priority that is to be updated. Zero is the lowest priority.

Limits: 0 through 3

LDELAY=([*trigger*], [*initial*], [*adjustment*], [*limit*])

SDELAY=([*trigger*], [*initial*], [*adjustment*], [*limit*])

Specifies the values for forcing procedures to wait. The trigger value specifies the number of processing units that a procedure can consume before a wait is forced. The three parameters *initial*, *adjustment*, and *limit* specify times in hundredths of a second with a maximum absolute value of 200 (that is 2 seconds).

The initial value is used for setting the period of the first wait. Subsequent wait times might be longer or shorter, being incremented or decremented by the adjustment value, which can be negative or zero. Consequently, the limit can be a maximum or minimum wait time. A zero adjustment results in the limit being set to the initial value, overriding any existing or specified value. When no limit value has been set and a positive adjustment has been specified a default maximum limit of 200 is used.

LNPRTY=([*trigger*], [*new_priority*])

SNPRTY=([*trigger*], [*new_priority*])

Specifies the values for altering the priorities of procedures as they execute. The trigger value specifies a number of processing units that can be consumed before a priority change occurs. The new priority must be 0 to 3 and can be the same as the current priority.

Example: Change Priority

This example sets a long-term priority change for procedures in group 1 (BACKGROUND). Priority 1 is to be altered to priority 2 after the consumption of 100 *processing units*.

```
SYSRCT G=1 P=1 LNP=(100,2)
```

The SYSPGT command can have been used to set the initial priority for this performance group to be 1.

Example: Force Waits

This example sets a forced wait for procedures running in priority 2 to occur every 20 *processing units*. The first wait would be for an interval of 5 hundredths of a second, the second would be 6, the third 7, and so on, until the maximum of 20 hundredths (0.2 seconds) is reached.

```
SYSRCT GROUP=1 PRIORITY=2 SDELAY=(20,5,1,20)
```

Example: Change Delay

This example alters only the short term delay value limit to be 30 hundredths of a second.

```
SYSRCT GR=1 PR1=2 SDELAY=(,,,30)
```

Remarks

Processing units are a simple measure of work arbitrarily assigned to the execution of NCL statements. They are in no way an accurate measure of actual work performed, or an approximation of CPU time consumed. You cannot compare the work done by two different NCL processes based on processing units consumed.

There are two sets of processing unit consumption statistics for each NCL procedure—one for short-term evaluation and the second for long-term evaluation. It also maintains a long-term dispatching priority as well as a current dispatching priority. Short-term statistics are reset whenever a voluntary loss of control occurs or a priority change takes place. A short-term priority change alters only the current dispatching priority, whereas a long term priority change alters both priorities.

The order of evaluation of performance control measures is as follows:

1. Long-term forced wait and priority change check
2. Short-term forced wait and priority change check

Only the first of the above that is triggered is actioned; however, both a priority change and a wait can occur at the same time, with the wait being actioned before the priority change. Procedures started using an &INTCMD statement are run in the owning process's performance group, starting at the performance group's initial priority.

The four performance groups are BACKGROUND, OCS, FULLSCREEN, and SYSTEM, numbered 1 to 4 respectively.

Record CPU Usage

This section describes how to use the CPU-time accounting facilities of NCL.

NCL CPU-time Accounting

NCL CPU-time accounting lets you collect NCL CPU usage data at user level. This data can then be used to generate reports on the CPU usage of each user.

NCL CPU usage data is provided by the generation of System Management Facility (SMF) records at regular time intervals. These records contain the user ID, and the amount of CPU-time used by that user, including multiple signons, and background APPC or ROF regions.

You can control the time interval at which records are generated, and the CPU-time threshold at which a record is generated using the USERACCT command.

You can also display the current status of CPU-time accounting (see page 65).

How You Implement NCL CPU-time Accounting

To implement NCL CPU-time accounting, the OPT=01 JCL parameter must be specified and SMF record generation must be enabled by the SMF parameter group. Your system must also be running *authorized* for SMF reporting to occur.

Note: CPU-time accounting might impede the performance of your system.

Generation of SMF Records

SMF records are generated under the following circumstances:

- If the amount of CPU-time used by the user since the last record was generated, surpasses a predefined threshold
- On system initialization if user NCL CPU-time accounting is active at the time of shutdown

Whenever an SMF record is generated for a user, their CPU-time is reset to zero. Each SMF record contains the amount of CPU-time used by the user since the previous SMF record was generated.

Threshold Levels and Report Intervals

You can generate records for all of the users by changing the threshold value to zero. This gives you a cutoff value for CPU usage at the end of the day.

Creating reports at intervals during the day is useful if the system fails. There will still be CPU usage information available.

Setting a minimum threshold level obtains update information for the heavy CPU users. Time is not wasted generating incremental reports for users who use little or no CPU time.

SMF Record Format

The SMF record format consists of the following sections:

- Standard SMF record header
- User ID
- CPU-time

The format is shown in the following table.

Offsets	Length	Format	Source	Description
Standard SMF Header				

Offsets	Length	Format	Source	Description
0	2	binary	internal	Record length
2	2	binary	internal	Segment descriptor (0000 as record not spanned)
4	1	binary	SVC 83	System indicator
5	1	binary	user supplied	Record type
6	4	binary	SVC 83	The time since midnight in hundredths of a second that record was moved to SMF buffer
10	4	packed	SVC 83	The date the record was moved to the SMF buffer, in the form 00YYDDDF (where F is the sign)
14	4	character	SMCASID	System identification (taken from the SID parameter)
Prefix				
18	1	binary	internal	Sub-category: X'06' for user CPU-time accounting
19	1	null	-	Reserved
20	12	character	internal	NMID of product region
CPU-time Accounting Section				
32	8	character	internal	User ID to which the CPU-time value applies
40	1	binary	internal	Code indicating where CPU-time was used (X'00' is NCL CPU-time)
41	1	null	-	Reserved
42	8	stck	internal	CPU-time accumulated by user since last SMF write (stck format, where bit 51=1 microsecond)
50	4	binary	SVC 83	The time since midnight, in hundredths of a second, that the last record was cut for this user (0 if first record)
54	4	packed	SVC 83	The date the last record was cut for this user, in the form 00YYDDDF (where F is the sign) (null if first record)

USERACCT Command—Control CPU-time Accounting

The USERACCT command is used to start and stop NCL CPU-time accounting. It is also used to set the SMF record ID, and parameters controlling the timing and level of SMF reporting. Some of these parameters affect the time interval and start time of SMF report generation, so they can only be set if NCL CPU-time reporting status is inactive.

This command has the following format:

```
USERACCT START
       [ SMFRECID=smf_record_id ]
       [ INTERVAL=hours_between_smf_records
         [ FROM=start_time_for_first_report ]
         [ MINCPU=minimum_cpu_time_to_report ] ]

USERACCT SET
       [ SMFRECID=smf_record_id ]
       [ INTERVAL=hours_between_smf_records
         [ FROM=start_time_for_first_report ]
         [ MINCPU=minimum_cpu_time_to_report ] ]

USERACCT STOP
```

START

Activates NCL CPU-time reporting. This operand controls whether SMF reports on the statistics are generated. The actual accumulation of CPU-time statistics occurs independently of the reporting process, thus CPU-time statistics are collected irrespective of whether reporting is active or inactive.

This operand is accepted only if reporting is currently inactive.

SMFRECID=*smf_record_id*

Specifies the SMF record ID to be used on SMF records that contain NCL accounting information. It is effective immediately after the command is issued, so the next record generated uses this smf-record-id value.

Default: The default SMF record ID, as specified in the SMF parameter group (enter **/PARMS**). (If there is no default SMF record ID and this operand is not specified, the reporting thread fails with an invalid record ID message.)

Limits: 128 through 255

INTERVAL=*hours_between_smf_records*

Specifies the number of hours between the generations of SMF records. This operand is only allowed if NCL CPU-time reporting is inactive at the time the command is entered.

Default: 24

Limits: 0, 1, 2, 3, 4, 6, 12, and 24 (0 is equal to 24)

FROM=*start_time_for_first_report*

Specifies the base time for the calculation of intervals. The default if this operand is not entered is 00.00.00 (midnight). The time that the first SMF record is generated is calculated by adding the hours-between-smf-records value to the start-time-for-first-report value.

For example, if the hours-between-smf-records value is 4 hours, and the start-time-for-first-report value is 01.10.00 (1.10 am), and the command is entered at 08.00.00 (8.00 am), then the next report will be at 09.10.00 (9.10 am). This is because, using the base time and interval, record generation occurs at 1.10, 5.10, 9.10, 13.10, 17.10, 21.10, and 1.10 again. So, if the command is entered at 8.00 am, the next report is due at 9.10 am.

MINCPU=*minimum_cpu_time_to_report*

Specifies the minimum amount of CPU-time that must have been accumulated since a report was last generated for a user, before another report is generated for that user. It is effective immediately after the command is issued, and is applied on the next report.

Default: 0

Limits: CPU seconds with up to 2 decimal places (for example, 1.25 seconds).

SET

Modifies the NCL CPU-time reporting parameters. It can be specified whether CPU-time reporting is active or inactive; however, the FROM and INTERVAL operands are accepted only when CPU-time reporting is inactive.

STOP

Stops user NCL CPU-time reporting. This operand controls whether SMF reports on the statistics are generated. The actual accumulation of user CPU-time statistics occurs independently of the reporting process, thus CPU-time statistics are collected irrespective of whether reporting is active or inactive.

This operand is accepted only if reporting is currently active. No other operands are valid in conjunction with STOP.

Note: NCL CPU-time accounting occurs independently of the report generation process. A CPU-time report for a user contains a field which shows the time at which the last report for that user was generated.

Display the Status of NCL CPU-time Accounting

The SHOW USERACCT command displays the current status of user NCL CPU-time accounting.

The information displayed shows the following:

- Whether NCL CPU-time accounting is active
- The SMF record ID
- The start time for reporting
- The SMF reporting interval
- The CPU-time threshold for reporting

The start time is in the form *hh.mm.ss*, the interval is in hours, and the threshold is in hundredths of a second.

Chapter 5: Using the SYSCMD Facility

Note: This section does not apply to CA SOLVE:FTS.

This section contains the following topics:

SYSCMD Facility

The SYSCMD facility lets you issue z/OS commands from your region.

Note: Generally, command authority is that of the user. However, if you are *not* using a security exit, or using a security exit and SYSPARMS AOMCUTOK=NO, command authority is that of the region.

Console Time-outs

A console that is assigned to an environment may be taken by another user if that console has not been used for a specific period of time. The only time that this cannot occur is when a console is locked to an environment, or if a solicited WTOR has been received by that environment.

More information:

SYSPARMS Operands (see page 257)

Lock Consoles to a Specific Environment

In most cases, the pool of JES consoles can be shared by any number of users on a temporary basis.

However, there are cases where a specific environment must not miss out on obtaining a console, for example, if the pool of consoles is temporarily exhausted, or the consoles are timed out and are unable to be reassigned.

Note: We recommend that you avoid using JES consoles and use Extended MCS consoles (XMCS) instead.

To lock consoles to an environment, use the **SYSCMD OPT=LOCK** command.

Important! If you use SYSCMD OPT=LOCK from an NCL procedure and the procedure needs to issue an &INTCLEAR, then make sure you use &INTCLEAR TYPE=ANY rather than &INTCLEAR TYPE=ALL. &INTCLEAR TYPE=ALL will release the locked console.

How a Locked Console Is Released

When locked, the console can be released only when one of the following events occurs:

- The console owner issues the SYSCMD OPT=REL command.

  Note: Although this releases the console from the owner, the console cannot be used by anyone else until the relevant time-out periods have elapsed.
- The OCS window is exited, terminating the dependent processing environment.
- You use the AOM STOP command to stop SYSCMD processing.

Simulate Command Issue from a Specific Console

You can use the SYSCMD facility to simulate issuing a command from a specific console you are not using from anywhere in the system.

Because no console authority checks are made by the SYSCMD facility, the existing authority for the specified console is used.

Note: The form of the SYSCMD command described is not supported if you are using EXTMCS consoles.

To simulate issuing a command from a specific console that you are not using, enter the following command:

```
SYSCMD CON=n DATA=command_text
```

n

Is the console number.

This form of the SYSCMD command is useful in NCL procedures started under console user IDs.

Example: Simulate Commands

A console operator, on Console 15, issues the following z/OS modify command to send a command to your region:

```
F nm,XYZ
```

Console 15 is signed on to the region as *xxxx*CN15 (where *xxxx* is the system user prefix). The XYZ command is then executed in this signed-on environment. Because XYZ is not a command recognized by the region, an NCL procedure of the same name is loaded and executed. If the following statements are in XYZ, then the commands are sent to z/OS as if they were entered one after the other at Console 15:

```
SYSCMD CON=&ZCONSOLE DATA=D J,L
SYSCMD CON=&ZCONSOLE DATA=D U,ALLOC
```

The result of the above commands is then returned to Console 15 without being intercepted by SYSCMD. This is true even when the specified console number is the same as a currently acquired console; the output is sent to the current owner of the console.

Display Information About the Console Pool

You can display the status of and various statistics for the console pool.

To display information about the console pool, enter the **SHOW CONSOLES** command.

The command returns the following types of console information:

- SYSPARMS settings
- Statistics

```
((16.26)------------ Operator Control Services (PROD) -------------------------
show consoles
N86E01 CONSOLE INFORMATION FOLLOWS...
N86E10 SYSPARM SETTINGS...
N86E11 CONSOLES AOMCTYPE AOMCMIGI AOMCUTOK AOMCTO1  AOMCTO2  AOMCTO3
N86E12 (20,10)  EXTMCS   Y        Y        10       20       5
N86E13 AOMCMIGX AOMCOPTS AOMJESCH AOMSUBCH
N86E14 NO       00       $        NO
N86E20 STATISTICS...
N86E21 #-LOG-AQ #-PHY-AQ %-PL-A AV-TM-PA #-LOG-RL #-PHY-RL %-PL-R AV-TM-PR
N86E22       11        7  63.63     1.28        9        0   0.00     0.00
N86E23 #-LA-MIG %-LA-M #-PA-MIG %-PA-M #-LA-FNC %-LA-F #-PA-FNC %-PA-F
N86E24        5  45.45        3  42.85        0   0.00        0   0.00
N86E30 C#  ID  NAME     STATUS   LOCK   AUTH     USERID   ENV      W T/O
N86E31   1 224 ZD1ZZ010 IN-USE   AOM    MASTER   DE1NAOMP AOM      - -
N86E31   2   - ZD1ZZ011 POOL     -      MASTER   -        -        - -
N86E31   3   - ZD1ZZ012 POOL     -      MASTER   -        -        - -
N86E31   4   - ZD1ZZ013 POOL     -      MASTER   -        -        - -
N86E31   5 225 ZD1ZZ014 POOL     -      MASTER   -        -        - -
N86E31   6   - ZD1ZZ015 POOL     -      MASTER   -        -        - -
N86E31   7 246 ZD1ZZ017 POOL     -      MASTER   -        -        - -
N11907 *END*
---------------------------------NetMaster ---------------------------------
==>
```

Note: For more information about the statistics, place your cursor on a line of statistics (for example, the N86E21 message line), and press F1 (Help).

SYSCMD in an &INTCMD Environment

You can use the &INTCMD NCL statement to execute any command in your region in a *dependent processing environment*. The results of commands are queued to the dependent environment and can be read.

To read these results, use the &INTREAD NCL statement.

By using the SYSCMD command in this way, you enable any NCL procedure to issue an operating system command and to receive the results. Command authorization, in this case, is based on the authority of the user initiating the NCL procedure.

How a Locked Console Is Released in an &INTCMD Environment

In an &INTCMD environment, a console is released when either &INTCLEAR [TYPE=ALL] is issued, or the executing NCL procedure is terminated. Additionally, a SYSCMD OPT=REL could be issued in the INTCMD environment to release the console.

Prefix Messages

SYSCMD messages carry several non-text attributes such as *jobname*. The SYSPARMS command can be used to request the prefixing of several of these attributes to SYSCMD messages, when these are displayed on an OCS console. This prefixing occurs just before display and has no effect on the actual delivery of the messages.

The following message attributes can be prefixed:

- Message time, in the format *hh:mm:ss* or *hh:mm*

  To prefix this, use the SYSPARMS AOMPRFTM=YES/HMS/HM/NO command.

- z/OS job name

  To prefix this, use the SYSPARMS AOMPRFJN=YES/NO command.

- z/OS job ID, in the format JOB *nnnnn*, or STC *nnnnn*, or TSU *nnnnn*

  To prefix this, use the SYSPARMS AOMPRFJI=NO/YES command.

- CA SOLVE:Operations Automation message source domain

  To prefix this, use the PROFILE PREFSYS=YES/NO command. This is not SYSCMD facility-specific.

A MSGPROC can see the text as it will be displayed, by using the &ZMPTEXT system variable.

More information:

SYSPARMS Operands (see page 257)

User-Generated Messages

The transportation of user-generated messages is facilitated by the &WTO, &WTOR, and &DOM NCL statements. These statements are available to any NCL procedure and provide a way for an NCL procedure to issue associated WTO, WTOR, or DOM functions.

Insertion Points

The &WTO, &WTOR, and &DOM NCL statements actually issue the associated SVC calls and therefore insert the message (or DOM) into the operating system itself.

&WTO NCL Statement

The &WTO NCL statement provides a direct interface to the WTO macro or SVC.

When &WTO is executed, the &ZDOMID system variable is set to the allocated DOMID. You can use this value on a subsequent &DOM statement to delete the message from the consoles.

Options on &WTO allow settings of the routing code, descriptor code, some MCS FLAG values, and delivery of the message to a specific console.

Recommendations for Using &WTO

When using &WTO, consider the following:

- Always provide a message identifier at the start of the message. This identifier should establish some connection with the issuer of the &WTO.
- Avoid using descriptor codes 1, 2, or 11. These descriptor codes cause the messages to be treated as Non-Roll-Delete (NRD) and can lead to excessive numbers of NRD messages being displayed.
- Excessive use of &WTO can lead to console buffer shortages.

Suggested Uses of &WTO

Suggested uses of &WTO are:

- Making the message Non-Roll-Delete when a major problem is detected, for example:

```
&WTO DESC=1 ROUTCDE=(1,2) DATA=C999 MAJOR CATASTROPHE +
                                    OCCURRED
&SAVEDOMID = &ZDOMID -* save domid for later deletion
```

  This message remains on all consoles until deleted by a following &DOM.

- Issuing a message to the master console, for example:

```
&WTO CONSOLE=1 DATA=AOM001 HI THERE...
```

- Issuing a console broadcast, for example:

```
&WTO MCSFLAG=BRDCST DATA=BC001 Broadcast msg
```

&WTOR NCL Statement

The &WTOR NCL statement provides a direct interface to the WTOR macro or SVC.

When &WTOR is executed, the NCL procedure is suspended until a reply to the WTOR is received or until an optional WAIT time (in seconds) has expired (the WTOR is canceled in this case). If the NCL procedure is flushed, the WTOR is also canceled.

Options on &WTOR allow the setting of routing codes, some MCS FLAG values, and delivery of the message to a specific console.

Other options allow the setting of a maximum reply length and an indication of how the reply is to be returned. It can be broken into words, nominated variables, or as a string in &1.

Recommendations for Using &WTOR

When using &WTOR, consider the following:

- Always provide a message identifier at the start of the message. This identifier should establish some connection with the issuer of the &WTOR.
- WTOR messages are always treated as Non-Roll-Delete. For this reason, keep the number of WTOR messages outstanding at any one time to a minimum.

Suggested Use of &WTOR

Use &WTOR to enable any NCL procedure to carry on a dialog with the z/OS console operator or with outboard automation tools such as CA Automation Point:

```
&WTOR STRING DATA=MSG001 WHAT IS YOUR NAME?
&WTO MSG002 HI, &1, I AM AOM
```

&DOM NCL Statement

The &DOM NCL statement provides a direct interface to the DOM macro or SVC.

The NCL procedure must supply a valid DOMID to the &DOM statement. This DOMID can be obtained from a preceding &WTO (using the &ZDOMID system variable).

A DOMID is formatted as eight hexadecimal digits. The first two are the system ID and the last six are a z/OS-assigned message ID.

When the DOM is received, it deletes any WTO or WTOR with the matching DOMID from the consoles.

Recommendations for Using &DOM

When using &DOM, consider the following:

- Issue &DOM only with a valid DOMID obtained as described above. An invalid format DOMID (not eight hex digits) causes the NCL procedure to be terminated. If the DOMID appears valid, but the actual number is not valid, the wrong message may be deleted.
- Delete messages only for a good reason. Indiscriminate deletion of critical messages can lead to severe operational problems.

Suggested Use of &DOM

Use &DOM following an &WTO statement to delete a message sent with descriptor code 1, 2, or 11. The &DOM is sent when the condition that caused the original message to appear is resolved.

Example

```
&WTO ...
&SAVEDOMID = &ZDOMID
...
...
&DOM ID=&SAVEDOMID
```

SYSCMD Facility Commands

The SYSCMD facility contains the following commands:

AOM START

Starts the local SYSCMD subset of the AOM operating system interface.

AOM STOP

Stops the local SYSCMD subset of the AOM operating system interface.

PROFILE

Displays a user profile.

SHOW AOMABEND

Displays diagnostic information if the SYSCMD subsystem interface code abends.

SHOW AOMSTAT

Displays AOM statistics.

SHOW CONSOLES

Displays the consoles currently allocated to your system for use by the SYSCMD facility.

STATUS

Displays current system status information.

SUBMIT

Passes a command to a background environment for processing.

SYSCMD

Issues a command to the local operating system and returns associated response messages to your system.

SYSPARMS

Initializes or modifies SYSCMD facility system parameter values.

Note: For more information about the above SYSCMD facility commands, see the online help.

SYSCMD NCL Verb and System Variable Summary

The following NCL verbs and system variables are available:

&DOM

Generates a z/OS DOM (Delete-Operator-Message).

&WTO

Generates a z/OS or WTO (Write-To-Operator) message.

&WTOR

Generates a z/OS WTOR (Write-To-Operator with Reply) message and waits for a reply.

The following system variables are available:

&ZMAOMAU

Inserts an AOM message authorized issuer flag.

&ZMAOMBC

Generates an AOM message broadcast flag.

&ZMAOMDTA

Indicates whether AOM data is present.

&ZMAOMID

Inserts AOM ID.

&ZMAOMJI

Inserts AOM job ID for z/OS-sourced messages.

&ZMAOMJN

Inserts AOM job name for z/OS-sourced messages.

&ZMAOMMID

Inserts AOM message ID.

&ZMAOMMIN

Inserts Multi-Line Write To Operator (MLWTO) minor line flag.

&ZMAOMMLC

Indicates YES if MLWTO minor CTL line.

&ZMAOMMLD

Indicates YES if MLWTO DATA.

&ZMAOMMLE

Indicates YES if MLWTO END.

&ZMAOMMLL

Indicates YES if MLWTO LABEL.

&ZMAOMMLT

Has MLWTO minor line type.

&ZMAOMMLV

Indicates AOM message level.

&ZMAOMMSG

Indicates whether message was delivered to an AOM receiver.

&ZMAOMRC

Inserts AOM routing codes in list format.

&ZMAOMRCM

Inserts AOM routing codes in MASKCHK format.

&ZMAOMRCX

Inserts AOM routing codes in hexadecimal format.

&ZMAOMSOS

Inserts AOM message source operating system environment.

&ZMAOMTM

Inserts AOM message time.

&ZMAOMTYP

Inserts AOM message type.

&ZMAOMUFM

Inserts AOM user flags in MASKCHK format.

&ZDOMID

Inserts CA SOLVE:Operations Automation or z/OS DOMID.

&ZFDBK

Inserts feedback code set by several NCL verbs.

&RETCODE

Inserts return code set by several NCL verbs.

Note: For more information about these SYSCMD NCL verbs and system variables, see the *Network Control Language Reference Guide*.

Chapter 6: Administering Signed-on Users

This section contains the following topics:

Show Active Users

At any time, only a selection of the defined users are actively signed-on to, or disconnected from, a given system. You can display these user IDs using *one* of the following methods:

- SHOW USERS command in the OCS window
- Active User List Facility

Note: All users must be defined to the security system by using *one* of the following:

- The User ID Access Maintenance Subsystem (UAMS)
- An external security package

For more information about security, see the *Security Guide*.

To show active users, enter **SHOW USERS** at the OCS prompt.

Note: For more information about the SHOW USERS command, press F1 (Help).

List Active Users

The Active User List facility assists help desk staff or the systems administrator to perform the following functions for one or more domains connected by INMC links:

- Monitor user activity
- Cancel a user
- Disconnect a user

The System Support : User ID List lets you identify which domain (in the generic resource) each user is currently attached to. You can then apply any of the available actions to a particular user attached to a particular domain.

On the User ID List, entries are displayed within their domains, with delimiter lines dividing the domains. The local domain (if selected) is always shown first, with others following in domain name (link name) order.

Error messages, such as NO MATCHING USER(S) ON THIS DOMAIN, are displayed for any domain where they apply.

Matching user IDs show the user ID and one of the following:

- The terminal name (LU name) if logged on (signed-on user)
- The disconnection data if applicable (disconnected user)

To list active users

1. Enter **/SS** at the prompt.

   The Security and System Services : Primary Menu appears.

2. Type **LU** at the Select Option prompt and complete the following fields:

   User ID

   Specifies the user ID for which you want to search. You can enter the leading characters of a user ID to limit the search. If you enter eight characters, then this value is used as an exact match. If you enter less than eight characters, then this value is treated as a prefix.

   Note: If the last character is an *, then it is ignored; that is, user IDs USER01 and USER01* are equivalent.

   Link or Domain Name

   Identifies the name of the domain from which you want to obtain information. There are four options:

   - Leave blank for the local system.
   - Enter a specific link name.
   - Enter **?** to display a list of link names from which you can select one or more.
   - Enter ***** to denote all active remote domains.

   Note: Link name on this panel means an INMC link that is currently active.

   Press Enter.

   The System Support : User ID List appears. The panel provides actions that enable you to disconnect or cancel a user session.

Chapter 7: Customizing External Applications Access

This section contains the following topics:

Access External Applications Function

The external applications function lets you access other products to assist in monitoring resources. It lets you specify access to external applications for network management, configuration management, problem management, and help desk.

To enable access to external applications from the region

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups panel appears.

2. Enter **U** (Update) beside the EXTAPPLS parameter group in the Interfaces category.

   The Customizer : Parameter Group panel for EXTAPPLS appears.

3. Complete the following fields for each type of external application that you want to access:

   LU1 Logmode

   Specifies the logon mode to be used by MTO command sessions.

   Note: These are the terminal name prefixes for the VTAM APPLS as defined during your installation.

4. Press F8 (Forward) to scroll through the next two panels.

   The application definition panel appears.

5. Complete the following fields for each external application that you want to access:

   Application Name

   Specifies the network name of the application providing the associated function.

   Logon Script

   Specifies the name of a procedure used to automate the application logon sequence and also request information from the application about a resource.

   Logon Data

   Specifies the data supplied to the external application as a part of session startup.

   a. (Optional) If you want to apply the changes immediately, press F6 (Action).

      The region takes on the changes.

   b. Press F3 (File).

      The changes are saved.

Application Access

When the applications are specified, you can access them using the following commands:

CFG

Accesses the configuration management application known to the region.

HD

Accesses the help desk application known to the region.

PRB

Accesses the problem management application known to the region.

XNM

Accesses the external network management application known to the region.

Logon Scripts

To customize where you log on to your external application, you can use a logon script. A logon script lets you automate the logon process.

Logon scripts are supplied for the following products:

RMSCPTNM

CA Mainframe Network Management

RMSCPTPM

CA SOLVE:Central Problem Management

RMSCPTCM

CA SOLVE:Central Configuration Management

RMSCPTHD

CA SOLVE:Central Problem Management Help Desk

Customize Logon Scripts

You can customize logon scripts to meet your own application requirements.

To customize a logon script

1. Enter **/ASADMIN.S** at the prompt.

   The Logon Scripts panel appears.

2. Enter the letter of the required Generate option at the Select Option prompt.

   The Logon Recording : Recording Details panel appears.

3. Specify the output string. This is the string that appears on the primary menu of the application that you are logging on to.

4. Specify the resource name string. This string will be recognized during recording as the point to substitute a resource name for which the command is to be executed.

5. Specify the stop key. The default is F15. This key ends the logon recording session.

6. Press F6 (Action).

   The logon recording starts.

7. Log on to the application, and do *one* of the following:

   - Proceed to the required location and press the stop key.
   - Proceed to a location where a resource name is required and enter the resource name string as specified in Step 4. Continue further if desired, and then press the stop key.

   The Logon Recording : Save Script panel appears.

8. Enter the data set details and press F6 (Generate).

   The script is generated and displayed.

Chapter 8: Customizing and Using MAI-OC

This section contains the following topics:

MAI-OC

MAI-OC lets you start multiple sessions with VTAM applications using Logical Unit Type-1 (LU1) protocols. It is available from OCS or from an NCL procedure. MAI-OC appears to the application as a line-by-line device, such as an IBM 3767 terminal.

You can use MAI-OC to provide centralized network operation of major systems such as CICS, IMS, or JES. The MAI-OC sessions act as the master consoles of the other application systems.

MAI-OC facilities are available from any Operator Console Services (OCS) window; however, before using MAI-OC, you should consider the use of MAI-OC sessions with certain subsystems, cross-domain MAI-OC sessions, and the use of MAI-OC from multiple systems to the same target applications.

You can operate an MAI-OC session from an NCL procedure using standard internal command environment processing through the &INTCMD facility. The NCL procedure can send data across the MAI-OC sessions that it is maintaining and receive output from those sessions.

MAI-OC sessions with other applications can be created from any processing environment. Most things that can be done from a native terminal can be done using an MAI-OC session.

In this section there are references to the commands that control the operation of MAI-OC. The use and syntax of MAI commands are described in the online help.

MAI-OC Sessions With Target Applications

When an MAI-OC session is established with a target application, MAI-OC emulates an LU-Type 1 device (for example, an IBM 3767) as the secondary end of the session. The target application sees the MAI-OC connection as a standard session with a physical 3767 terminal.

Certain application subsystems, such as IMS, require that every logical unit with which they are to have a session be defined to them before any session with the LU is allowed.

To establish MAI-OC sessions with systems such as CICS or IMS, include the VTAM LU names for MAI-OC to use when requesting the session in the appropriate system definitions. Other relevant information should be included with the VTAM LU names, such as the ability of the logical unit to act as a master terminal, its authority level.

Note: The definition to a subsystem such as CICS or IMS is the same as for a physical 3767 device. See the appropriate manuals for the precise coding requirements for the system that you are using.

Sample LU Definitions

The following sections provide sample LU definitions for CICS, IMS, JES2, and JES3.

Note: All LU names likely to be used to create a session with these applications should be defined as a separate terminal to that application.

For information about definition requirements and to customize the definitions to your own requirements, see the appropriate subsystem guides.

MAI-OC to a CICS System

The following definition enables an MAI-OC session to start with a CICS system using an LU name of NMMAO001:

```
DFHTCT    TYPE=TERMINAL                                    *
          ACCMETH=VTAM                                     *
          BRACKET=YES                                      *
          BUFFER=256                                       *
          BMSFEAT=(noroute,norouteall)                     *
          GMMSG=YES                                        *
          NETNAME=NMMAO001                                 *
          OPERID=id                                        *
          OPERPRI=code                                     *
          PGESIZE=(12,80)                                  *
          PGESTAT=PAGE,*RELREQ=(YES,YES)                   *
          RUSIZE=256                                       *
          TIOAL=256                                        *
          TRMIDNT=term                                     *
          TRMSTAT=TRANSCEIVE                               *
          TRMTYPE=3767
```

MAI-OC to an IMS System

The following definition enables an MAI-OC session to start with an IMS system using the LU name of NMMTO and providing master terminal authority:

```
TYPE     UNITYPE=SLUTYPE1
TERMINAL NAME=NMMTO,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     (lterm,MASTER)
```

The following definition provides IMS support for a terminal named NMMAO001, which could be used by MAI-OC for general operations and transaction execution:

```
TYPE     UNITYPE=SLUTYPE1
TERMINAL NAME=NMMAO001,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     lterm
```

MAI-OC to a JES2 System

The following definition lets you use MAI-OC on a JES2 system:

```
LOGON1 APPLID=JES2
&MAXSESS=nn
&NUMLNES=nn
&NUMRJE=nn
&NUMTPBF=nn
&MLBFSIZ=256
&TPBFSIZ=256

LINE1 UNIT=SNA

RMT1  LUTYPE1,BUFSIZE=256,LINE=1,CONSOLE,                    *
      NOCMPCT,NOCOMP,SETUPHDR,                               *
      SETUPINF,WAITIME=1,                                    *
      NUMPR=0,NUMRD=0,LUNAME=NMMAO001
```

In this example, an MAI-OC session started on LU NMMAO001 is automatically assigned to workstation RMT1. If the LUNAME parameter on the RMT1 statement is omitted, a user creating an MAI-OC session can specify the required workstation name in user data on the MAILOGON command, for example:

```
MAILOGON JES2 DATA=RMT1
```

MAI-OC to a JES3 System

The following definition lets you use MAI-OC on a JES3 system:

```
COMMDEFN,APPLID=JES3,LU=nn
CONSOLE,JNAME=RJE01,TYPE=RJP,DEST=NONE
RJPWS,N=RJE01,RD=0,PR=0,G=RJE01,AUTO=N,
COMPACT=NO,C=R,LU=NMMAO001
```

In this example, an MAI-OC session started on LU NMMAO001 is automatically assigned to workstation RJE01. If the LU parameter on the RJPWS statement is omitted, a user creating an MAI-OC session can specify the required workstation name in user data on the MAILOGON command, for example:

```
MAILOGON JES3 DATA=RJE01
```

Cross-Domain MAI-OC Sessions

Unless VTAM is configured to support dynamic cross domain definition and adjacent SSCP lookup, for a user in one domain to request an MAI-OC session with a target application running in another domain, the following conditions must be satisfied:

- The appropriate cross domain resource definitions must be filed in the VTAM definition library
- The target subsystem must have the MAI-OC LUNAME defined to it as a valid terminal if required

Log On to Another Application

Using MAI-OC to log on to another application creates an MAI-OC session. You can create sessions with as many applications as you require and multiple sessions with the same application.

When the connection is established, you receive an initial message from the application informing you that you are connected.

Note: If the session is established with JES, you do not receive a message to confirm connection.

To log on to another application using MAI-OC, enter the following command:

```
MAILOGON application_id
```

Example: Log On to a CICS Application

The following command establishes a session with a CICS application with the application ID of CICSA:

```
MAILOGON CICSA
```

Create a Session Identifier

Each session you create is given a unique session identifier. This identifier defaults to the name of the application program with which the session is established, but you can choose any 1- to 8-character name.

The session identifier is used in all MAI-OC commands, so you should make it as meaningful as possible.

If you create multiple sessions with one application from the same window, you must allocate a unique identifier to each session. If the first session's identifier defaults to the application name, you must specify a unique identifier for subsequent sessions with the same application.

The uniqueness of a session identifier applies only to the primary environment. You can open another window at the terminal and create more MAI-OC sessions using identifiers already used in the first window.

To create a session identifier, enter the following command:

```
MAILOGON application_id ID=session_id
```

This session with *application_id* is identified by *session_id*.

Example: Create a Session ID

For example, to change the session ID of your CICS application from CICSA to CICSPROD, enter the following command:

```
MAILOGON CICSA ID=CICSPROD
```

List Established Sessions

You can list all established MAI-OC sessions and the identifiers used for each.

To list all active MAI-OC sessions, enter the **SHOW MAI** command.

LU Name for an MAI-OC Session

Before you can start an MAI-OC session with a target application, the system must allocate the LU name that is to be used to act as the *terminal* end of the session.

The LU name may be allowed to default or a particular LU name may be specified on the LU= operand of the MAILOGON command.

LU Name From a Pool

If no specific LU name is provided on the MAILOGON command, MAI-OC generates one consisting of the MAIOPREF prefix (set by the LU1 Terminal Prefix field of the EXTAPPLPOOLS parameter group in Customizer) followed by a number in the range 001 - 999. The number chosen is the first that is not already in use by another MAI-OC session.

This technique lets you establish an MAI-OC session without knowing the identity of the terminal that MAI-OC will simulate. It also implies that when the session is established, the LU name used by MAI-OC is unpredictable.

When an MAILOGON request without a specified LU name fails because MAI has chosen an unknown LU name, MAI tries up to five successive LU names (each beginning with the MAIOPREF prefix) before indicating that no MAI-OC LUs are available. This is because a defined MAI-OC LU may have been varied inactive; therefore, appears to MAI the same as an LU that has not been defined.

Specific LU Name

If you want an MAI-OC session with a target application in which the MAI-OC LU name must be the name of a specific terminal, the MAILOGON LU= operand lets you specify the LU name that MAI-OC is to use.

This technique requires that you have knowledge of the terminal that is to be used on the session, but it also means that the identity of the terminal is predictable.

This facility is necessary to establish an MAI-OC session that has to have particular attributes, for example:

- An IMS system is generated with its IMS Master Terminal (primary operating console) having the LU name of MTO3767P.
- An operator is to operate an MAI-OC session from the OCS window of a terminal, with the MAI-OC session driving the IMS Master Terminal.
- The Operator requests the MAI-OC session with a MAILOGON command, specifying LU=MTO3767P on the command text. MAI-OC will open a VTAM ACB whose APPL name is MTO3767P and which must have been defined to VTAM as an APPL.

Note: An MAI Installation Exit (MAIEX02), if provided, is driven whenever a session request is processed. This exit may override the LU name or prefix, if required.

Application Logoff

Most MAI-OC sessions can be terminated by sending a logoff command of the type expected by the application. For example, for TSO, the command would be LOGOFF; for IMS, the command would be /RCL.

However, some applications (such as JES) do not have a logoff command, or you may have trouble sending the command. In these cases, you can use the MAIDISC command to force the disconnection (see page 92).

If you exit OCS with MAI-OC sessions intact, your region automatically generates MAIDISC commands for all your MAI-OC sessions. This causes lost terminal conditions at the applications for all your MAI-OC sessions. We do not recommend that you use MAIDISC to end TSO sessions because the logoff leaves a reconnect environment pending for a system-defined period.

Disconnect an MAI-OC Session

If you cannot log off an MAI-OC session normally, you can use the MAIDISC command and specify the session ID that you want to disconnect with.

To disconnect an MAI-OC session, enter the following command:

```
MAIDISC session_id
```

Example: Disconnect an MAI-OC Session

The following command ends the session with a CICSA application that was established with the default CICSA session ID:

```
MAIDISC CICSA
```

Interrupt an MAI-OC Session

You can interrupt an MAI-OC session to achieve different effects depending on the application you are connected to. For example, if you have a TSO session established, an interrupt cancels the current operation. If you have an IMS session, it removes the current message from the queue and requests the next one. See the relevant product guide for more information about the effect of an interrupt.

To interrupt an MAI-OC session, enter the following command:

```
MAIINT session_id
```

You can also use the MAIINT command to generate an attention interrupt to an application by using the TYPE=ATTN operand and a cancel interrupt by using the TYPE=CNCL operand.

Example: Interrupt an MAI-OC Session

The following command interrupts the session with a CICSA application that was established with the default CICSA session ID:

```
MAIINT CICSA
```

Send Data to an Application

When you have logged on to an application, you may want to send data to the application.

To send data to an application, use the MAISEND command. This command nominates the session identifier of the session over which you want to send the data, followed by the data you want to send.

To send data to an application, enter the following command:

MAISEND *session_id data*

Note: An MAI-OC session looks like a session with a hard-copy terminal. It does not function on a full-screen basis. For example, an attempt to invoke ISPF on a TSO session is rejected.

Example: Send Data to an Application Session

The following command sends data to the CICSA session:

```
MAISEND CICSA CEMT I TRAN
```

MAI-OC may append a new line character to the message (to simulate a RETURN key) and the data is sent.

Data Received from an Application

Data received from an application is issued as line messages to the environment that last issued an MAI-OC command against that session. For example, if you issued an MAILOGON command from OCS, then the initial application messages resulting from the session establishment are received by the OCS environment. If the next MAI-OC command for that session is from a dependent environment, for example MAISEND through $CMDENT, then further messages are returned to the dependent environment.

Application data is displayed unchanged, with the possible addition of some information before the text. This information is the session identifier of the session from which the data was received. For example:

```
(CICS) H2002I TERMINAL CONNECTED
```

The presence of the prefix information and its format is controlled by options specified on the MAILOGON command.

The messages may be in response to a command or NCL system variable that was issued, or they might be unsolicited information, depending on the way the application functions. However, all messages are flagged as unsolicited.

Note: The PROFILE UNSOL=NO command does not prevent the receipt of messages generated by an MAI-OC session.

Commands to an Application

When you issue commands to an application using an MAI-OC session, it works in the same way as issuing commands using OCS. However, there are some special considerations for sessions with IMS applications.

MAI-OC lets you simulate a logical keyboard locked condition, as well as abbreviate commands, use function keys, and use NCL procedures to simplify control procedures for the application.

Any commands that can be issued from an OCS window can also be issued from an NCL procedure. Even NCL procedures operating in full-screen mode (for example, invoked through an FSPROC command) can make use of MAI-OC sessions.

How Commands Behave While Waiting for Application Response

Because MAI-OC simulates a real terminal, it is possible to get a logical keyboard locked condition in which MAI-OC is, for instance, waiting for a response from the application. At this time, the MAISEND command cannot be used to send data to the application and if entered is rejected with an appropriate error message. Normally the command can be retried later. Of course, any other region commands can be entered while you are waiting.

How Commands Can Be Abbreviated

You can use NCL procedures and terminal function keys to simplify MAI-OC command requirements, and you can shorten or automate many MAI-OC commands using the EQUATE command.

Check with your systems administrator for EQUATE commands and NCL procedures that have already been set up for use.

Issue Multi-Segment Commands to an IMS Application

When sending commands to an IMS application over an MAI-OC session, IMS requires that some input messages be multi-segment. Specifically, a /BRO command must be in two segments. Consider, for example, the following command:

```
/BRO NODE NMMAV003 COFFEE TIME
```

To make this command form two segments, IMS requires a new line character after the node name and before the message.

The MAILOGON command lets you specify a character to represent a new line character in data sent through an MAISEND command.

To issue multi-segment commands

1. Create an MAI-OC session specifying a new line character, for example:

   ```
   MAILOGON IMS NL=+
   ```

   The command defines the new line character as the plus sign (+).

2. Send the multi-segment command, for example:

   ```
   MAISEND IMS /BRO NODE NMMAV003+COFFEE TIME
   ```

   The plus sign (+) is replaced by the necessary new line character.

MAI-OC and Multiple Regions

When more than one region in a network has MAI-OC sessions with the same set of target applications, you should assign a unique set of MAI-OC LU names to each region. This associates the names used by each region with the region in which that region is executing, and avoids VTAM definition conflicts when attempting to start cross-region sessions.

The other advantage of assigning each region its own set of MAI-OC LU names is that it allows added control over which regions can establish MAI-OC sessions with which subsystems.

EQUATE Values for MAI-OC Commands

The MAI-OC feature performs the functions of session connection and disconnection, and sends messages on sessions in response to MAI-OC commands issued by users.

If the standard SOLVE EQUATE command is used, MAI-OC commands can be made easier to use. For certain applications, use of EQUATE values enables the operation of MAI-OC sessions to be identical to operation of the same session from a native terminal attached directly to the application.

Note: The use of EQUATEs varies according to the requirements of different installations. Consider how EQUATEs can be used to make MAI-OC operation simple in your installation.

Example: Equate an MAISEND Command for an IMS Session

You have an MAI-OC session with an IMS system and want to display the IMS transaction queue. You use the following full MAI command:

```
MAISEND IMS /DIS Q TRAN
```

MAISEND

Specifies the command that requests MAI-OC to transfer data across a session.

IMS

Specifies the session identifier of a session with the IMS application to which to send the message.

The remainder of the data, starting with the slash (/), is the message sent to the application.

By setting up the following EQUATE value, you can enter the IMS message text in its native form. The region expands the slash (/) to the full MAISEND command format:

```
EQUATE / MAISEND IMS /
```

An alternative is to EQUATE the target application name to the MAISEND command.

Example: Equate an MAISEND Command for a JES Session

You set up the following EQUATE for use on a JES session:

```
EQUATE $ MAISEND JES2 $
```

You can use the EQUATE to enter JES2 commands as if in native mode, for example:

```
$DA
```

MAI Installation Exit

An MAI installation exit (MAIEX02) is provided with your product. This provides security checking and validates and changes the characteristics of an MAI-OC session.

The exit is driven whenever a session request is to be processed if the MAIEX02 SYSPARM has an exit name specified. This exit can override the LU name or prefix, if required.

More information:

MAI Installation Exit MAIEX02 (see page 295)

Session Protocols

An MAI-OC session functions as a true SNA LU-type 1, and adheres to the protocols described in the IBM publication *3767 Component Description*.

When MAI-OC has a session with JES2 or JES3, it appears as a 3776-type RJE device. This is still an LU-type 1, and the protocols used are a subset of those described above.

As MAI-OC is simulating a real terminal, it is possible to get a logical *keyboard locked* condition in which MAI-OC is, for instance, waiting for a response from the application. At this time, the MAISEND command cannot be used to send data to the application, and if entered will be rejected with an appropriate error message.

The SHOW MAI command can be used to determine the session states of MAI sessions. Information given includes whether the *keyboard* is locked or unlocked, the SNA bracket state, and the general session state. Abbreviations used for states in the display are generally those used in the *3767 Component Description*:

INB

In Bracket

BETB

Between Brackets

BBP

Begin Bracket Pending

SEND

Send State (can send to application)

RCV

Receive State (cannot send)

DRWT

Waiting for a definite response (cannot send)

STBY

Standby State (can send).
Indeterminate state (state change in progress or not in session).

The CON field in the display may contain the following:

YES

Session established and available.

NO

Session not yet established.

LCK

Session established but keyboard locked, because session state is not such that data may be sent.

SCS Character Support

SCS control characters are used by some systems for print layout instructions. They tell an output device (usually a printer) how to respond to tab, spacing, line break and other formatting control sequences.

Not all SCS control characters can be fully simulated at a terminal; however, none cause a session to be rejected, and wherever possible MAI-OC translates the SCS character to the best equivalent function that OCS mode can provide.

This section details the actions taken by MAI-OC on receiving data streams containing the following SCS characters:

New Line X'15'

Data following the character is displayed on a new line of the operator window.

Form Feed X'0C'

As New Line.

Line Feed X'25'

Stripped from the data stream.

Vertical Tab X'0B'

As New Line.

Record Separator X'1E'

As New Line.

Carriage Return X'0D'

As New Line.

Vertical Channel Select X'04nn'

As New Line.

Horizontal Tab X'05'

Replaced by a blank.

Backspace X'16'

Logically deletes previous character in the line.

Inhibit Print X'24'

Stops data sent to the application being echoed to the screen or the activity log. Data is replaced by asterisks.

Enable Print X'14'

Resumes echoing after a previous Inhibit Print.

Set Horizontal Format X'2BC1'

Stripped from the data stream (together with all associated counts and so on).

Set Vertical Format X'2BC2'

As Set Horizontal Format.

SCS Characters Sent by MAI-OC

The only SCS character sent by MAI-OC to an application is the New Line (X'15') character. It is appended to each message sent and you can be embedded in data. For more information, see the NL= operand of the MAILOGON command in the online help.

Strike-over Masks

A common technique used on hard copy terminals to hide entered data such as passwords is the use of a strike-over mask, where two or more lines of characters are printed one over the other, and the print head left underneath these characters. The next line of data typed is then unreadable.

MAI-OC keeps track of where the print head would be on a real hard copy terminal and prevents the echoing to the screen or activity log of all or some of the next line of data sent to the application. Any characters sent that would be underneath other characters are replaced by an asterisk. For example, suppose MAI-OC received the following string of characters from the application:

XXXXXXXX<LLLLLLLL<00000000<

<

Specifies an SCS carriage return (X'0D').

If the MAI-OC user were then to send the characters MYPASSWORD to the application, those characters would be echoed to the screen and log as ********RD, because the first eight characters would be obscured on a real terminal. Multiple backspace characters instead of carriage return could be used in the mask.

An alternative to the use of strike-over masks is the use of the Inhibit and Enable Print SCS control characters.

JES MAI-OC Sessions

JES regards an MAI-OC session as a session with an RJE workstation. This means that data sent to JES is regarded as input from a remote console, so any authorized JES command may be sent and the results returned to the window.

However, JES does limit the scope of commands that can be entered from a remote console. Generally, with the provision of the appropriate operands on commands and the correct authorization in JES, commands can be entered to perform any JES display-type function. However, commands can only change the status of jobs, and so on, owned by the workstation. Of course, the OPSYS OCS command can be used to enter commands, if required.

JES commands are available to shorten responses to commands, for example, to remove the leading time stamps). Their use should be considered to make the display as neat as possible.

JES2, and JES3 if so configured, do not send a salutation message to a workstation when it logs on. This means that there is no indication that an MAI-OC session request has completed. Use the SHOW MAI command to determine when the session is established.

JES does not have a logoff command. Use the MAIDISC command to terminate a JES session.

MAI-OC Mode Table and Bind Checks

The following logmode table should be assembled and linked into the appropriate VTAM library (for example, SYS1.VTAMLIB in z/OS). It accurately defines MAI-OC session characteristics and results in the most efficient use of a session. It should then be specified on all MAI-OC VTAM APPL statements using the MODETAB=MAIVMODE operand:

```
MAIVMODE  MODETAB

MAIVMDE   MODEENT LOGMODE=MAIVMDE                                    *
          FMPROF=X'03'                                               *
          TSPROF=X'03'                                               *
          PRIPROT=X'B1'                                              *
          SECPROT=X'90'                                              *
          COMPROT=X'3080'                                            *
          RUSIZES=X'8585'                                            *
          SSNDPAC=X'00'                                              *
          SRCVPAC=X'01'                                              *
          PSNDPAC=X'01'                                              *
          PSERVIC=X'010000008000800000000000'
```

The following table shows the checks MAI-OC performs on BIND parameters at session initiation. The bits shown are checked by MAI; bits not shown are not checked. Invalid BIND parameters are rejected by MAI.

Byte	Bit	Setting	Meaning
2	all	X’03’	FMPROF
3	all	X’03’	TSPROF
4			PRIPROT
	2-3	B’00’	Invalid
		B’01’	Exception response
		B’10’	Definite response
		B’11’	Exception or definite response
	6	B’0’	Compression not used
	7	B’1’	End bracket may be sent
5			SECPROT
	2-3	B’00’	Invalid
		B’01’	Exception response
		B’10’	Definite response
		B’11’	Exception or definite response
	7	B’0’	End bracket not sent
		B’1’	End bracket may be sent
6			COMPROT1
		2B’1’	Brackets are used
	3	B’1’	Bracket termination rule 1
	4	B’0’	Alternate code not used
7			COMPROT 2
	0-1	B’00’	Invalid
		B’10’	Flip-flop mode
		B’01’	Contention mode
		B’11’	Invalid
	2	B’0’	Contention loser recovers
	3	B’0’	Primary is contention loser

MAI-OC Logmode Entry Selection

MAI chooses the logmode entry for an MAI-OC session by searching (by name) the logmode table specified by the MODETAB operand in the APPL definition for the MAI-OC LU selected. The logmode table specified by this operand must be assembled and linked into a load library accessible to CA SOLVE:Access.

The MAIVMODE table supplied in the CC2DSAMP distribution library contains a sample logmode entry used by MAI for MAI-OC sessions. It is recommended that this entry be copied into the logmode table specified. Alternatively, the MAI-OC APPL definition may specify the MAIVMODE table. This is the case in the sample MAI-OC APPL definitions.

MAI-OC Operational Scenario

This section contains examples of VTAM and MAI-OC definitions that are necessary in an installation with the following configuration and requirements:

- Two regions, one called NMP running on the production machine, the other called NMT running on the testing machine
- TSO running on both machines, one called TSOP, the other TSOT
- IMS running on both machines, one called IMSP, the other IMST
- A Network Operator uses a terminal logged on to NMP to:
  - Control VTAM in both machines
  - Operate IMS Master Terminals to both IMS systems using MAI-OC from his terminal
- Authorized personnel can log on to either region and create MAI-OC sessions with the TSO or IMS of their choice. A maximum of three MAI-OC sessions from each region are allowed.

Production Machine Definitions

This section contains examples of the following production machine definitions:

- VTAM
- MAI-OC
- IMSP

VTAM Definitions

```
MAOP001 APPL MODETAB=MAIVMODE,EAS=1
MAOP002 APPL MODETAB=MAIVMODE,EAS=1
MAOP003 APPL MODETAB=MAIVMODE,EAS=1
MAOMTOP APPL MODETAB=MAIVMODE,EAS=1
MAOMTOT APPL MODETAB=MAIVMODE,EAS=1

MAOT001 CDRSC CDRM=TCDRM
MAOT002 CDRSC CDRM=TCDRM
MAOT003 CDRSC CDRM=TCDRM
```

MAI-OC Definitions

The value of the LU1 Terminal Prefix field in the EXTAPPLPOOLS parameter group is NMMAV.

IMSP Definitions

```
TYPE     UNITYPE=SLUTYPE1

TERMINAL NAME=MAOMTOP,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     (MAOMTOP,MASTER)

TERMINAL NAME=MAOP001,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOP001

TERMINAL NAME=MAOP002,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOP002

TERMINAL NAME=MAOP003,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOP003R

TERMINAL NAME=MAOT001,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOT001

TERMINAL NAME=MAOT002,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOT002

TERMINAL NAME=MAOT003,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOT003
```

Network Operator Action

The following creates an MAI-OC session to IMSP as Master Terminal:

```
MAILOGON IMSP LU=MAOMTOP NL=+ WAIT=PERM
```

The following creates a cross-domain MAI-OC session to IMST as Master Terminal:

```
MAILOGON IMST LU=MAOMTOT NL=+ WAIT=PERM
```

Other User

The following creates a session with IMSP using LU MAOP001:

```
MAILOGON IMSP
```

The following creates a cross-domain session with IMST using LU MAOP002:

```
MAILOGON IMST
```

The following creates a cross-domain session with TSOT using LU MAOP003:

```
MAILOGON TSOT
```

Testing Machine Definitions

This section contains examples of the following testing machine definitions:

- VTAM
- MAI-OC
- IMST

VTAM Definitions

```
MAOT001 APPL MODETAB=MAIVMODE,EAS=1
MAOT002 APPL MODETAB=MAIVMODE,EAS=1
MAOT003 APPL MODETAB=MAIVMODE,EAS=1

MAOP001 CDRSC CDRM=PCDRM
MAOP002 CDRSC CDRM=PCDRM
MAOP003 CDRSC CDRM=PCDRM
MAOMTOT CDRSC CDRM=PCDRM
```

MAI-OC Definitions

The value of the LU1 Terminal Prefix field in the EXTAPPLPOOLS parameter group is MAOT.

IMST Definitions

```
TYPE     UNITYPE=SLUTYPE1

TERMINAL NAME=MAOMTOT,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     (MAOMTOT,MASTER)

TERMINAL NAME=MAOP001,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOP001

TERMINAL NAME=MAOP002,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOP002

TERMINAL NAME=MAOP003,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOP003

TERMINAL NAME=MAOT001,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOT001R

TERMINAL NAME=MAOT002,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOT002

TERMINAL NAME=MAOT003,COMPT1=(CONSOLE,MFS-SCS1),OUTBUF=256
NAME     MAOT003
```

User Action

The following creates a session with IMST using LU MAOT001:

```
MAILOGON IMST
```

The following creates a cross-domain session with IMSP using LUMAOT002:

```
MAILOGON IMSP
```

The following creates a session with TSOT using LU MAOT003:

```
MAILOGON TSOT
```

Chapter 9: Working With System Image Definitions

Note: This chapter applies to all products except CA SOLVE:FTS.

This section contains the following topics:

How You Implement System Images

You define the operations requirements of the resources to be managed on a system in a system image. You must create a system image definition before you can define the resources you want to manage.

Note: For information about creating your initial system image, see the *Administration Guide.*

You define a system image by giving it a name and assigning a version number. You must also nominate a home system on which the image can be loaded.

Note: If you are defining a system image for a subordinate region in a multisystem environment, the image name is restricted to that specified during the linking operation.

You assign different version numbers to create different views of the managed resources in the knowledge base. For example, the current live version of an image is version 0001, the new version (which contains changes that are not yet implemented) is version 0002, and the old version (a view of the image as it was before the changes in the current version were implemented) is version 0003.

You can also use the version to reflect the creation date of the system image, for example, 0705 for May 2007.

Note: The $TEMPLAT system image name is reserved for templates. For more information about how to work with templates, see the *Administration Guide.*

Example: Implement System Images

You are responsible for the IS department of the eastern branch of a company, and you have defined a development system image called EASTTEST 0001. When the branch needs to add or change some definitions, you copy EASTTEST 0001 to a new image called EASTTEST 0002. You change the contents of EASTTEST 0002 and test it until it is working properly.

When the changes are working, you copy EASTTEST 0001 to a new image called EASTTEST 0003. This new image can be used as a backup if EASTTEST 0002 fails for any reason. You then load EASTTEST 0002 to make it temporarily the current image and delete EASTTEST 0001. You can then copy EASTTEST 0002 to a new EASTTEST 0001 and load this EASTTEST 0001 image.

The next time you want to update the current system, you update EASTTEST 0002, test it and back up EASTTEST 0001 to EASTTEST 0003. You then proceed as before to create a new EASTTEST 0001 by copying the tested EASTTEST 0002.

Access System Image Definitions

The knowledge base contains a list of system image definitions.

To access the list of system image definitions stored in the knowledge base, enter the **/RADMIN.I** at the prompt.

The system image definitions appear.

Active system images have the following color coding:

- White is used to indicate the active system image used by the local region.
- Turquoise is used to indicate the active system images used by connected regions.

Note: Updating an *active* system image has an immediate effect on the operations of the resources controlled by the region.

Define a System Image

You must add a system image definition to the knowledge base.

To add a system image definition, press F4 (Add) from the System Image List panel.

A System Image Definition panel appears. You can now define the system image.

Example: Define a System Image

This example defines the system image named EASTTEST, which represents a development system of the same name (the home system). The following panel shows the completed definition:

```
PROD------------ ResourceView : System Image Definition ---------------------
Command ===>                                                  Function=ADD


System Name ......... EASTTEST
Database Version .... 0001
Home System ......... EASTTEST  (...where the image will load. Blank for ALL)

Short Description ... Development system for Eastern
Long Description .... Handles application development and testing by Eastern
                      branch programmers.  Contains all the resources
                      necessary to maintain this environment.


EventView Ruleset to Activate +









 F1=Help      F2=Split     F3=File      F4=Save
                           F9=Swap                              F12=Cancel
```

For products that support event management, you can associate an EventView rule set with the system image by using the EventView Ruleset to Activate field. The rule set is activated when the system image becomes active, thus enabling event-based automation through the active event rules.

Note: By default, ResourceView and EventView rule actions are not executed in the MANUAL operation mode. However, the actions can be enabled by using the Perform Action in Manual Mode? field of the AUTOIDS Customizer parameter group.

System Image Maintenance

You can browse and update system image definitions, and copy and delete system images, from the System Image List panel.

Notes:

- If you make changes to the definitions belonging to an active system image, the changes become effective in the active image immediately.
- In a multisystem environment, this active image can be in one of the connected regions.

Merge System Images

You can use the C (Copy) action code to merge two system images. When you merge the images, you can specify whether you want to overlay existing definitions. The target system image contains the merged definitions.

To merge a source system image into a target system image

1. From the System Image List panel, enter **C** beside the source system image.

   The system image definition appears.

2. Complete the following fields:

   System Name

   Specifies the name of the target system image.

   Database Version

   Specifies the version number of the target system image.

3. Press F3 (File) to initiate the merging operation.

   You are prompted to confirm the operation.

4. Indicate whether you want to overlay definitions that already exist in the target. Press F6 (Confirm) to start the actual merging operation.

   The system images are merged. A panel is displayed to indicate the progress of the operation.

Resource Definitions

To enable the region to manage your resources, you need to define those resources to the knowledge base by using resource definitions.

The resource definitions belong to system images. To work with the definitions, you should have defined at least one image.

How You Can Access Resource Definitions

You can access resource definitions through one of the following:

- Resource Definition panel
- System Image List
- Status Monitor

Access Resource Definitions from the Resource Definition Panel

To access resource definitions from the Resource Definition panel

1. Enter **/RADMIN.R** at the prompt.

   The Resource Definition panel appears.

2. Enter **S** next to the class of resources you want to access.

   The resource list appears.

   Note: The list panel identifies the system image to which the resources belong. If you want to list the resources belonging to another system image, update the System Name and Version fields.

You can access the list of resources directly by entering the following panel path: /RADMIN.R.*resource_class_name*. For example, to list started tasks, enter **/RADMIN.R.STC**.

Access Resource Definitions from the System Image List

To access resource definitions from the System Image List

1. Enter **/RADMIN.I** at the prompt.

   The System Image List appears.

2. Enter **R** next to the appropriate system image.

   The resource definitions in that image appear.

Access Resource Definitions from the Status Monitor

The Status Monitor displays the resources that are being monitored. You can update (DB line command), copy (CPY line command), and add (F4 function key) resources from the monitor.

To access resource definitions from the Status Monitor, enter the shortcut to the monitor.

The monitor appears listing the monitored resources.

Resource Definition Panels

When you define a resource definition, the following series of panels appears:

- General Description (you must complete this panel)
- Activation Details
- Inactivation Details
- Force Inactivation Details
- Display and Heartbeat Details
- Status Monitor Message Details
- State Change Exits
- Automation Log Details
- Owner Details
- Extended Function Exit

Define a Resource to a System Image

To define a resource, you must enter information on a series of panels. Each product supports its own resource classes and these classes all have a different series of panels.

You can use variables (see page 406) as data in a resource definition.

To define a resource to the system image, press F4 (Add) from the resource list window.

A General Description panel appears. This is the first in a series of panels you use to define the resource to the system image.

Notes:

- You can facilitate the definition of local resources to a system image by using AutoAssist facilities (if supported by your product).
- The class INTNL is for internal use only. Do not add resources of this class.

Describe the Resource

The General Description panel specifies general characteristics of the resource.

To describe the resource

1. Complete the mandatory fields (for example, resource name and type).
2. (Optional) Apply a template to the definition.

   The definition is populated with values from the template.
3. (Optional) Complete the optional fields as required.

How You Use Resource Templates

A set of sample templates for resources is supplied with most resource classes. You can use these templates or define your own templates to simplify the task of creating resource definitions.

You apply a template using the options under Template Selection on the General Description panel.

You can specify how you want to handle any map or processes specified in the template in the Copy Map and Copy Process fields. Valid values are as follows:

No

Do not copy.

Replace

Copy; replace if the map or process exists in the system image.

Yes

Copy only if the map or process does not exist in the system image.

Note: Global processes are already visible to the resource definition and are not copied into the system image, irrespective of the value in the Copy Process field.

In the Template Selection window, you can perform a number of actions by entering the action code beside the TemplateName field. These actions are as follows:

B (Browse)

Displays the contents of a template definition.

L (List)

Displays the list of available templates.

M (Merge)

Merges the values in a template with the existing values in a resource definition (for example, to update a resource definition). Merging does not overwrite existing values, so ensure that you delete the values in the resource definition that are to be replaced. Merging also does not set data that conflicts with existing data (for example, a process name is not set when a command already exists).

O (Override)

Populates the fields in a resource definition with the values in a template (for example, to add a resource definition by using a template as the model).

R (Reset)

Clears the fields in a resource definition, then overrides it with the values in a template.

Note: The M, O, and R actions do not affect the system image, resource name, and description fields specified in a resource definition. Before you apply the M, O, or R action, you should ensure that the resource name is specified.

Specify the Operation Mode

The operation mode specifies how the defined resource operates. During operation, the global operation mode of the system image can restrict the specified mode.

The global operation mode can be either AUTOMATED or MANUAL, with the former having a higher rank. If the global operation mode is MANUAL, the resource operation mode of AUTOMATED is forced to MANUAL during operation.

Note: For information about how to set the global operation mode, see the *Administration Guide*.

To specify the operation mode, specify AUTOMATED, IGNORED, MANUAL, OFF, or STARTAUTO in the Operation Mode field.

Control the VTAM ACB of a Resource

Some resources have ACBs. The ACBs must be available before these resources can start successfully. The ACB Name field enables you to invoke the following actions automatically during resource startup and shutdown:

- The ACB is activated by the following command before the resource is started:

  `VARY NET,ACT,ID=`*`acb_name`*

- The ACB is inactivated by the following command if the resource is stopped successfully:

  `VARY NET,INACT,ID=`*`acb_name`*`,IMMED`

To control the VTAM ACB of a resource, specify the name of the ACB in the ACB Name field.

Define the Availability of a Resource

Some resource classes let you specify changes to the normal availability of the resources by using availability maps. An availability map also enables you to schedule changes to the operation mode and the starting of processes. You can attach more than one resource to an availability map.

To attach the resource to an availability map, select the map in the Availability Map field.

If no suitable map is available, you can add a map through the F10 (EditMap) function key.

Note: If you intend to form a parent-child relationship between resource definitions where the availability is determined by the parent, attach the map to the parent definition and define the desired state of the children to be always ACTIVE.

Note: The availability of a service overrides the availability of the resources that make up the service. If the resource always operates as part of a service, let the service handle the availability of the resource. Define the desired state of the resource to be always INACTIVE. When the service starts, it places an ACTIVE desired state override on the resource.

Define the Activation Details

Some resource definitions let you specify the following activation details:

- How to activate the resource
- What to do if the activation is successful
- What to do if the activation is not successful

If you want to perform preactivation processing, you can specify it on the State Change Exits panel.

To define the activation details for the resource

1. Press F8 (Forward) from the General Description panel.

   The Activation Details panel appears.

   The A (activate) command uses the information on this panel.

   Note: For information about how to use the A command, see the *User Guide*.

2. Specify the information required for starting the resource. For an example, see a template distributed with the product.

   - If the starting method is simple, specify a system command, time-out (see page 135) and status change information, and the expected completion message (see page 136).

     You can extend the message definition (see page 139).

   - If the starting method requires more than one command or requires the processing of multiple messages, use a process. You can create and maintain processes on the Process List panel, which is accessible through the /RADMIN.P panel path.

     Note: You can use the $NCL process to execute an NCL procedure (see page 142).

     If you use a process, your process must set the return code to one of the following values, to notify the region to set the correct actual state of the resource:

     - 0 notifies the region to set the actual state to ACTIVE, indicating that the process is successful.
     - 12 notifies the region to do nothing. For example, the process might have set the state already by using the SETSTATE macro on behalf of the region.

       Use this method only if the set state is acceptable to the ACTIVE desired state. The acceptable states are ACTIVE, DEGRADED, and STARTING. If the result of the process is unacceptable, set the return code to, for example, 8 to indicate that the process failed to achieve the desired state.
     - 99 notifies the region to proceed the same way as if a system command has been issued (that is, wait for the expected completion message and possibly perform time-out processing).
     - Other return codes indicate that the process is unsuccessful.

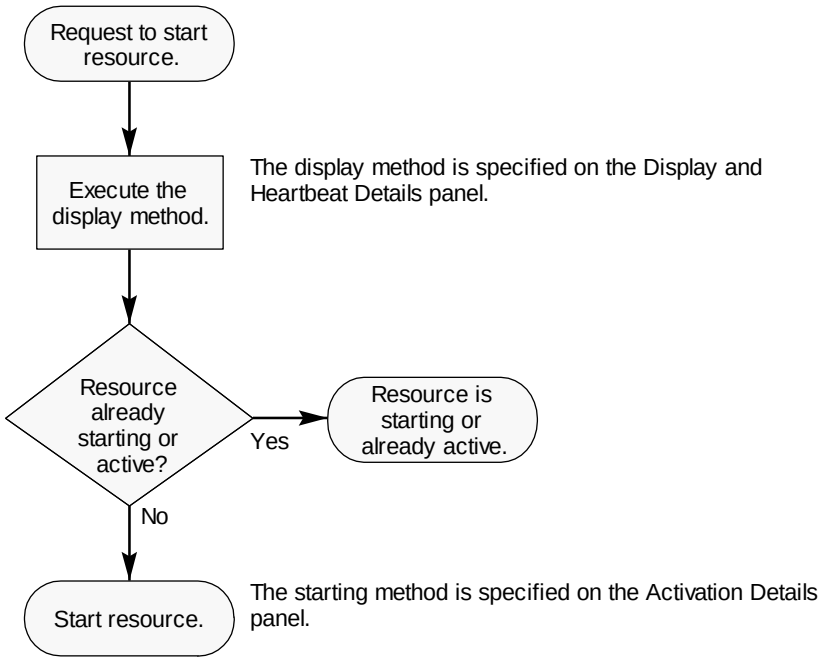
       If time-out processing is specified, the region performs the processing immediately. The region does not wait for the period specified in the Timeout After field.

       If time-out processing is not specified, the region does *not* change the actual state. The region can proceed no further with the automated starting of the resource. The *automation status* is set to FAILED, and the logical state is forced to INERROR.

   Note: If you provide *no* command or process for starting the resource, the region cannot start the resource when required. Instead of trying to start the resource, the region places the resource in the MANUAL operation mode. The exception is when the resource has a type of LOGICAL.

How Activation Works

During automation, the region uses the display method to check the status of the resource that is to be started. If the resource is already starting or has already become active, the starting method is not executed. The following illustration shows the sequence of events that occurs during the starting operation:



Note: A similar sequence of events occurs when a request to stop a resource is processed.

How Restart Control Affects Resource Restarts

Conditions might arise when an automated resource becomes active momentarily only and then turns inactive, causing the region to restart the resource. If the condition persists, the region will continue to restart the resource every time the resource deviates from the ACTIVE state. To prevent this situation from continuing unchecked, you can use the restart control parameters to limit the number of times activation is retried.

The restart control parameters specify the maximum number of restarts that are permitted within a specified time period. The time period starts the first time the resource is activated.

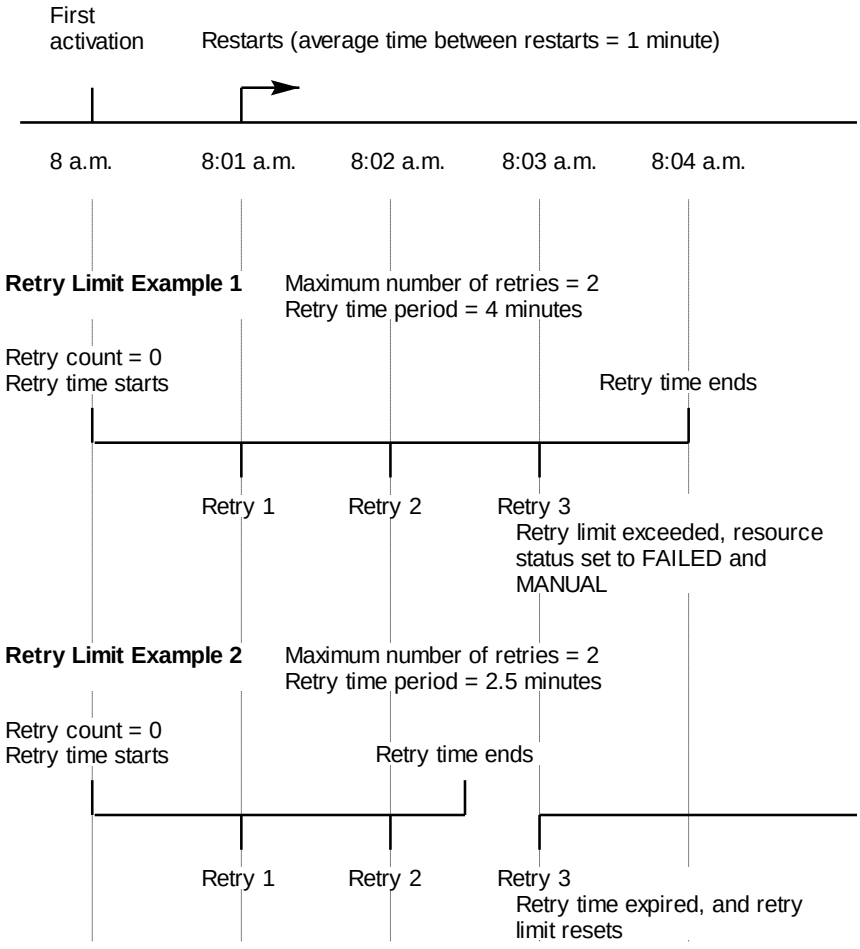
If this retry limit is exceeded, the actual state of the resource is set to FAILED and the operation mode of the resource is set to MANUAL. No further activation is performed.

If the retry limit is not exceeded, the next activation that occurs outside the retry time period will reset the retry count and period.

Example: Effect of Activation Limits on Resource Restarts

The following illustration shows how different retry limits affect resource restarts. In the first example, the retry limit is exceeded and the resource status is set to FAILED and MANUAL. In the second example, the retry limit is never exceeded and the restarts will continue unchecked.

Important! For restarts to be limited, the retry time period must be long enough for the retry limit to be exceeded.



If no restarts are required, the retry time period will expire and the parameters will have no effect on resource operations.

Effect of Restart Control on Manual Activation

Restart control applies irrespective of how the resource is activated, whether automatically or manually. The first activation resets the retry limit, and subsequent activations contribute to the retry limit.

Specify the Restart Control Parameters

You can specify the following restart control parameters:

- The retry limit
- What action to take if the retry limit is exceeded

To specify the restart control parameters

1. Enter **U** in the Restart Control Parameters window on the Activation Details panel.

   The Restart Control Parameters panel appears.

2. Complete the panel, and then press F3 (OK).

   Note: If you want to prevent the region from restarting the resource, enter **0** in the Retry Attempt Limit field and a time period in the Retry Time Limit field. If an attempt to restart the resource occurs within the specified time period, the activation is not performed and the resource state is set to FAILED. The operation mode of the resource is also set to MANUAL.

   The Activation Details panel reappears.

Define the Inactivation Details

Some resource classes let you specify the following inactivation details:

- How to inactivate the resource normally
- What to do if the inactivation is successful
- What to do if the inactivation is not successful

To define the inactivation details for the resource

1. Press F8 (Forward) from the Activation Details panel.

   The Inactivation Details panel appears.

   The T (terminate) command uses the information on this panel.

   Note: For information about how to use the T command, see the *User Guide*.

2. Specify the information required for stopping the resource. For an example, see a template distributed with the product.

   - If the stopping method is simple, specify a system command, time-out (see page 135) and status change information, and the expected completion message (see page 136).

     You can extend the message definition (see page 139).

   - If the stopping method is complex, use a process.

     Note: You can use the $NCL process to execute an NCL procedure (see page 142).

     If you use a process, your process must set the return code to one of the following values, to notify the region to set the correct actual state of the resource:

     - 0 notifies the region to set the actual state to INACTIVE, indicating that the process is successful.
     - 12 notifies the region to do nothing. For example, the process might have set the state already by using the SETSTATE macro.

       Use this method only if the set state is acceptable to the INACTIVE desired state. The acceptable states are INACTIVE and STOPPING. If the result of the process is unacceptable, set the return code to, for example, 8 to indicate that the process failed to achieve the desired state.
     - 99 notifies the region to proceed the same way as if a system command has been issued (that is, wait for the expected completion message and possibly perform time-out processing).
     - Other return codes indicates that the process is unsuccessful.

       If time-out processing is specified, the region performs the processing immediately. The region does not wait for the period specified in the Timeout After field.

       If time-out processing is not specified, the region does *not* change the actual state. The region can proceed no further with the automated stopping of the resource. The *automation status* is set to FAILED, and the logical state is forced to INERROR.

   Note: If you provide *no* command or process for stopping the resource, the region cannot stop the resource when required. Instead of trying to stop the resource, the region places the resource in the MANUAL operation mode. The exception is when the resource has a type of LOGICAL.

How Inactivation Works

During automation, the region uses the display method to check whether the resource that is to be stopped is already inactive. If the resource is already inactive, the stopping method is not executed.

Define the Forced Inactivation Details

Some resource classes let you specify the following forced inactivation details:

- How to force the inactivation of the resource
- What to do if the forced inactivation is successful
- What to do if the forced inactivation is not successful

To define the forced inactivation details for the resource

1. Press F8 (Forward) from the Inactivation Details panel.

   The Force Inactivation Details panel appears.

   The TF (terminate by force) command uses the information on this panel. The T (terminate) command might also use this information if a time-out action of Try Force Inactivation is specified on the Inactivation Details panel.

   Note: For information about how to use the TF and T commands, see the *User Guide*.

2. Specify the information required to force the resource to stop. For an example, see a template distributed with the product.

   - If the forced method is simple, specify a system command, time-out (see page 135) and status change information, and the expected completion message (see page 136).

     You can extend the message definition (see page 139).

- If the method is complex, use a process.

  Note: You can use the $NCL process to execute an NCL procedure (see page 142).

  If you use a process, your process must set one of the return codes in the following table, to notify the region to set the correct actual state of the resource:

  - 0 notifies the region to set the actual state to INACTIVE, indicating that the process is successful.
  - 12 notifies the region to do nothing. For example, the process might have set the state already by using the SETSTATE macro.

    Use this method only if the set state is acceptable to the INACTIVE desired state. The acceptable states are INACTIVE and STOPPING. If the result of the process is unacceptable, set the return code to, for example, 8 to indicate that the process failed to achieve the desired state.
  - 99 notifies the region to proceed the same way as if a system command has been issued (that is, wait for the expected completion message and possibly perform time-out processing).
  - Other return codes indicate that the process is unsuccessful.

    If time-out processing is specified, the region performs the processing immediately. The region does not wait for the period specified in the Timeout After field.

    If time-out processing is not specified, the region does *not* change the actual state. The region can proceed no further with the automated forced stopping of the resource. The *automation status* is set to FAILED, and the logical state is forced to INERROR.

Note: If you provide *no* command or process to force the stopping of the resource, the region cannot force the resource to stop when required. Instead of trying to force the resource to stop, the region places the resource in the MANUAL operation mode. The exception is when the resource has a type of LOGICAL.

How Forced Inactivation Works

During automation, the region uses the display method to check whether the resource that is to be stopped by force is already inactive before executing the specified stopping method. If the resource is already inactive, the stopping method is not executed.

Define the Display and Heartbeat Details

Some resource classes let you specify how to find out about the status of the resource. Before the region starts or stops a resource, the region executes the display method to determine the actual state of the resource. The heartbeat interval enables you to set up regular checking of the resource status.

To define the display and heartbeat details for the resource

1. Press F8 (Forward) from the Force Inactivation Details panel.

   The Display and Heartbeat Details panel appears. For an example, see a template distributed with the product.

   Generally, the CHECKALL, CHK (check), and D (display) commands use the method on this panel when checking or displaying the resource status. The exceptions are resources that have their own special D commands. You can identify these exceptions from the list of command definitions. To access the list, enter the **/ASADMIN.C** path.

2. Specify the display method required for status checking. You can specify a system command or a process without specifying the heartbeat interval.

   Note: Resource definitions with a class of JOB or STC have a default display method that is used when no specific method is specified. The default method checks the existence of the address space ID, and sets the actual state to either ACTIVE or INACTIVE. When a JOB or STC definition specifies no display method, the D command issues D J,*resource_name*.

   Important! The heartbeat feature increases CPU consumption. Use this feature only for resources that are liable to change state without an accompanying message.

   - If the display method is simple, specify a system command, heartbeat interval, and the expected response message (see page 136).

     You can extend the message definition (see page 139).

   - If the display method is complex, use a process.

     Note: You can use the $NCL process to execute an NCL procedure (see page 142).

     If you use a process, your process must set the return code to *one* of the following values:

     - 0 notifies the region to set the actual state to ACTIVE.
     - 1 notifies the region to set the actual state to STARTING.
     - 2 notifies the region to set the actual state to STOPPING.
     - 3 notifies the region to set the actual state to DEGRADED.
     - 5 notifies the region to set the actual state to INACTIVE.
     - 6 notifies the region to set the actual state to FAILED.
     - 12 notifies the region to do nothing. For example, the process has set the state already by using the SETSTATE macro.
     - Other return codes notify the region to set the actual state to UNKNOWN.

Status Monitor Message Details

The status monitor message details specify rules that can be triggered by messages to perform actions.

From the Status Monitor Messages panel, you can set up message rules to perform actions that are message dependent. The information defined on this panel includes the message identifier and text, the message rule priority, and the effect of the rule on the resource state. You can define up to 97 lines of message rules.

The rule priority is only significant when rules overlap. Priorities are organized in descending numeric order. For example, the value 10 indicates a higher priority than the value 20. If rules overlap, only the rule with the highest priority is processed. If overlapping rules have the same priority value, the most specific rule has the highest priority. For a set of overlapping rules, the rules are sorted in the order of decreasing priority.

The modifiable Status fields are optional. If a Status field is blank, the message rule does not trigger a state change.

The region uses the rules to monitor the messages for the particular resource. If a rule is triggered, the resource state is updated according to the value in the Status column.

Extended Message Definition Considerations

Normally, actions associated with the extended message definition are performed only if the resource is in the AUTOMATED operation mode. This condition is set in the AUTOIDS Customizer parameter group. To access the list of parameter groups, enter the **/PARMS** shortcut.

The information specified on the Define Extended Display Attribute panel, however, is always acted on irrespective of the operation mode.

RECOVERED Actual State

The RECOVERED actual state enables the recognition of messages that are the results of recovery from a DEGRADED or FAILED state.

DEGRADED and FAILED are special actual states consisting of a base state and an applied flag as indicated in the following table:

Actual State	Flag	Base Actual State When the Flag Is Applied
DEGRADED	DEGRADED	ACTIVE
FAILED	FAILED	Previous actual state

Note: The base actual state can be changed by the automation engine.

To detect a recovery condition, you should use the RECOVERED actual state. When the state is triggered, it removes the DEGRADED or FAILED flag, and sets the base state to ACTIVE.

Desired State Management Considerations

If your product uses desired state management or your resources are running in AUTOMATED mode, the automation engine acts as follows when the actual state of a resource changes to an actual state that is not the same as its desired state:

- If the actual state changes to ACTIVE or INACTIVE, the automation engine attempts to bring the resource to the desired state.
- If the actual state changes to DEGRADED, the automation engine attempts to bring the base state of the resource to match that of the desired state.
- If the actual state changes to FAILED, the automation engine does not attempt recovery unless recovery actions are specified in the message rule.
- If the actual state changes to STARTING or STOPPING, the automation engine takes no action unless actions are specified in the message rule.
- If the actual state changes to UNKNOWN, the automation engine invokes the specified display processing to attempt to determine the state. However, if the UNKNOWN state is the result of an activation or inactivation time-out, the engine sets the automation status to FAILED.

Implement the State Change Exits

Some resource classes let you specify state change exits through processes. You can specify two types of exit processes:

- A process that executes before the starting method specified on the Activation Details panel is performed.
- Processes that execute when specified state changes occur. For example, if a resource fails, you may want to invoke a process that writes a problem report. You can specify a process to execute when the actual state, the desired state, or the logical state of the resource changes.

To implement the state change exits for the resource

1. Press F8 (Forward) from the Status Monitor Message Details panel.

   The State Change Exits panel appears.

2. Specify the required exits.

   The specified information is saved when you save the resource definition.

Example: Failure Exit

The following panel shows an example in which the State Change Exits panel specifies that a process be executed when the resource fails:

```
. State Change Exits ------------------------------------------------------.
|                      S/B=Browse U=Update I=Interactive L=List P=Parameters |
|     Invoked                    Process  Parameters                        |
| ___ BEFORE ACTIVATION                                                     |
|     State   Change    Change                                              |
|     Type    From      To       Process  Parameters                        |
| ___ ACTUAL  ANY       FAILED   PROBSOLV ACB=PROB                          |
```

Logging Details

The Automation Log Details Panel displays information about the size of the temporary log for the resource (called a *transient log*), the destination of the logged information, and the type of information logged.

If your product region uses too much storage, tune it by reducing the size of your transient logs. Transient logs can use a lot of storage, and over the lifetime of a product region, can grow until they reach their maximum size. Set the Log Table to the appropriate size according to the resource you want to monitor. For example, you do not need 9,999 lines for a JES initiator or any other resource. Log All System Messages and Log Internal Audit Trail should only be enabled when debugging a resource.

This product supports the STL action against images listed at /RADMIN.I.L and the SETTLOG command at status monitors, which lets you update the transient log size globally.

Note: For more information, see the *Administration Guide*.

The following shows the Automation Log Details panel:

```
Resource Log Controls

  Transient Log Size ......... 0150
  Log to Automation Log ...... YES
  Log to Console ............. NO
  Log to OCS Window .......... NO

Resource Log Content Controls

  Log All System Msgs ........ NO
  Log Internal Audit Trail ... NO
```

Transient Log Size

Specifies the total number of messages that the transient log can hold. The default is set in the AUTOTABLES Customizer parameter group during the initialization of the region.

The transient log is kept in memory. A large size can affect extended memory allocation.

The transient log is cyclic. That is, if the log is full, a new message displaces the oldest message.

Limits: 0 through 9999

Log to Automation Log

Specifies whether to write transient log messages to the activity log.

Default: NO

Log to Console

Specifies whether to send messages to the system console as WTO messages. Select this option only for resources that are started before VTAM and if you want to debug the resource definitions.

Default: NO

Log to OCS Window

Specifies whether to send messages to users who are monitoring from OCS.

Default: NO

Log All System Msgs

Specifies whether to log all messages for a resource. If the value is NO, the region logs only messages that match the message rules in the resource definition.

Messages are written to the transient log and to any destinations specified in the previous options.

Default: NO

Log Internal Audit Trail

Specifies whether to log the internal audit trail. The audit trail is a detailed log of the processing and actions performed in the region, and is useful for debugging the resource definition.

Note: The option creates a high volume of message flow. Turn on the option only if required.

The audit trail is logged to the transient log and any destinations specified in the previous options.

Default: NO

Specify the Owner Details

The Owner Details panel lets you identify up to two people who can be contacted if the resource has operational problems. The template does not assign this information.

To specify the owner details

1. From the Automation Log Details panel, press F8 (Forward).

   The Owner Details panel appears.

2. Specify the details, as required.

   Press F1 (Help) for information about the fields.

Implement the Extended Function Exit

Some resource classes let you provide additional operator functions using an NCL procedure. The procedure is invoked when an operator issues the XF command against the resource.

To implement the extended function exit for the resource

1. Press F8 (Forward) from the Owner Details panel.

   The Extended Function Exit panel appears.

2. Specify the exit NCL procedure that provides the extended functions. This procedure has access to variables with the prefix ZRM.

   The specified information is saved when you save the resource definition.

More information:

Variables Available to a Command NCL Procedure (see page 174)
Knowledge Base Variables (see page 406)
Status Variables (see page 410)

Time-outs

You can specify how long to wait for the response to an action in the Timeout After field on the following panels:

- Activation Details panel
- Inactivation Details panel
- Force Inactivation Details panel

Usually, the response to the action sets the actual state of the resource to the state specified in the Status column.

However, if for any reason the expected response to the action does not come, then, depending on the timeout settings, the following occurs:

- If you have *not* specified a value in the Timeout After field, the region keeps waiting for a response until a significant event changes the status of the resource.

  The exception is the time-out for a resource of the LOGICAL type. For a logical resource, the default value for the Timeout After field is 0 (that is, no waiting).

- If you specified a value in the Timeout After field and you specified the action to take when time-out occurs, the region takes the specified action. The action sets the resource to a specified actual state. On the Inactivation Details panel, you can, instead of specifying the actual state to set, specify that the resource be stopped by force according to the forced inactivation details.

- If you specified a value in the Timeout After field but you did *not* specify any action, the region performs the display processing specified on the Display and Heartbeat panel.

  Note: For a logical resource, display processing is not applicable. The actual state of the logical resource is set directly to the expected result of the action. A starting action results in an actual state of ACTIVE; a stopping action results in an actual state of INACTIVE.

  If the response to the action indicates that the desired state is satisfied, the region sets the correct actual state.

  If the response to the action indicates a state other than the desired state, the region can proceed no further with the automated process. The region does *not* change the actual state of the resource, but sets the *automation status* for the resource to FAILED and forces the logical state of the resource to INERROR.

How You Specify Messages in a Resource Definition

While defining a resource, you may need to specify messages on the following panels (if they apply to your resource class):

- Activation Details panel
- Inactivation Details panel
- Force Inactivation Details panel
- Display and Heartbeat Details panel
- Status Monitor Message Details panel

Enter the following querying codes in a message field to help you specify the messages:

- Enter **?** to obtain a list of suggested messages.
- Enter **??** to obtain a list of all the messages learned from EventView, if present.
- Enter **???** to obtain a list of the messages in the transient log for the resource. This feature simplifies message selection, because a transient log contains only messages that are relevant to the resource.

Select Messages in the Transient Log

When you are working on a resource definition, you can use the transient log of a resource as a source of resource-specific messages.

Before you use the ??? action, you should ensure the following:

- On the Automation Log Details panel of the resource definition, the value in the Log All System Msgs field is YES.
- The definition has been saved in the knowledge base.
- The system image that contains the resource is active.

To select messages in the transient log for the resource

1. Enter the **/RMON** shortcut.

   The status monitor appears. If you are using a filter, you might need to change the filter in order to see the resource. (Use the FILTER command to list the defined filters.)

2. (For resources that have specified activation and inactivation methods) Find the resource, ensure that the operation mode is IGNORED or MANUAL, and then issue the **A** (activate) and the **T** (terminate) commands manually.

   The resource starts and stops.

3. Issue the **D** (display) command when the resource becomes active and when the resource becomes inactive.

   These actions populate the transient log with messages.

4. Enter **DB** beside the resource.

   The Panel Display List panel for the resource definition appears.

5. Select the required panel, and enter **???** in a message field on the panel.

   The Transient Log Browse panel appears.

6. Browse the transient log, and select the appropriate message.

   The Resource Definition panel is redisplayed with the selected message in the message field.

Special Message Prefixes

Normally, a resource definition in an active system image recognizes only messages for the corresponding resource. However, the following special message prefixes are available to enable a resource definition to handle special types of local messages. You *cannot* combine prefixes.

$AA-

A resource definition can generate a user-defined resource event. For another resource definition to recognize the event message, you must prefix the message by $AA- when you specify the message rule in that definition.

For example, ALERT - VTAM AVAILABLE is specified as the event message on the Define Event Related Action panel of a resource definition. To enable the resource you are defining to recognize that message, you must specify $AA-ALERT - VTAM AVAILABLE as the message text to look for.

$DN-

A message can be a delete operator message (DOM) notification. For a resource definition to recognize a DOM notification, you must prefix the message by $DN-.

For example, specifying $DN-IEF233A M 380 enables a resource definition to recognize the DOM notification for the tape mounting request message IEF233A M 380.

$MN-

A resource definition recognizes messages that relate to the resource itself only. For a resource definition to recognize messages from other resources and from the operating system, you must prefix the messages by $MN-.

For example, you might want to detect the starting and the stopping of a batch job that performs system backup. Detecting those messages enables you to stop and restart a resource, as required, by changing the desired state of the resource through the SVCMD macro in a process.

End-of-Memory Condition

End-of-memory detection is the default when a resource definition panel contains no message rules that set the resource status to INACTIVE. If you find that the message rules in your resource definitions are not detecting the INACTIVE state correctly, you can use end-of-memory detection:

- You can enable end-of-memory detection by removing the message rules that set an INACTIVE status.
- If you have many resource definitions to update and they are based on a template, you change the template and then apply the changes. In this case, we recommend that you change message rule status to STOPPING instead of removing the message rules altogether.

Extend the Definition of Resource Message Rules

You can extend the definition of any message rule in a resource definition (as entered on the Activation, Inactivation, Force Inactivation, Display and Heartbeat, and Status Monitor Message Details panels).

To extend a rule, enter **S** next to the message.

A selection panel appears, listing the following extended message definition panels:

- Define Extended Filter panel
- Define Event Related Actions panel
- Define Event Exits panel
- Define Event Display Attribute panel
- Event Documentation panel

Extended Message Filter

Use the Extended Filter Definition panel to specify the criteria for analyzing message text. A message is acceptable if it meets the criteria you specify here. For example, the same message may indicate different resource states, depending on the event that generates the message.

Note: If you want to capture a message that has leading blanks, you do not need to specify the leading blanks on the message filter panel. However, on the Extended Message Filter panel, absolute position is important so leading blanks must be counted when using start position of text.

Event-related Actions

Use the Define Event Related Actions panel to define particular actions that the region performs when it receives a particular message. The following actions are available:

- Change the operation mode of the resource
- Issue a system command, reply to a WTOR message, or generate a resource event—use the $AA- message prefix when specifying a message rule in a resource definition if you want the definition to recognize resource events
- Log a user-defined message
- Execute a process

Note: You can use the $NCL process to execute an NCL procedure (see page 142).

Event Exits

Use the Define Event Exits panel to define state change exits, problem exits, or other exits that are specific to this message rule. These exits are invoked when a message satisfying the rule is received. For example, if the rule is for a message generated by an event that causes the performance of the resource to degrade, you may want to specify an exit that logs the degradation in a problem management application.

Extended Display Attributes

Use the Define Extended Display Attribute panel to do the following:

- Override the status monitor fields.
- Override the display attributes.
- Define keyword that can be used by status monitor filters.
- Define information that can be displayed on icons.

Example: Define Extended Display

This example shows the Define Extended Display Attribute panel for a message rule. If the rule is triggered, the definition provides the specified extended display in green, where &ZMSGWORD6 is the sixth word of the triggering message.

```
PROD---- ResourceView : STC PRODAPPL Define Extended Display Attribute -------
Command ===>                                                  Function=BROWSE

+ Extended Display (EXTDISP) ------------------------------------------------+
| INACTIVE CLASS &ZMSGWORD6                                                  |
+----------------------------------------------------------------------------+
+ Extended Display Attributes ------------------------------------------------+
|                                                                            |
|   Intensity    Color        Highlight  Use on Graphic Monitor?    Severity  |
|   LOW          GREEN        NONE           (Change Icon Color?)      (1-9)  |
+----------------------------------------------------------------------------+
. User Defined Filter Keyword -----------------------------------------------.
|                                                                            |
| Keyword Value ...              (Use USERKEYW when defining Filters)        |
'----------------------------------------------------------------------------'
+ User Defined Variables -----------------------------------------------------+
|                                                                            |
| Var    Value                              Var    Value                    |
|      =                                         =                           |
|      =                                         =                           |
|      =                                         =                           |
+----------------------------------------------------------------------------+
 F1=Help      F2=Split     F3=Exit                                  F7=Backward
 F8=Forward   F9=Swap                  F11=Panels
```

How You Override the Status Monitor Fields

Use the Extended Display field to define the text to be overlaid on the status monitor line for this resource. The override text can pick up specified words from the original message if you specify &ZMSGWORD*n*. For example, if you specify an extended display of ACTIVE CLASS=&ZMSGWORD9, the override text displays the class as the ninth word in the original message.

If you leave this field blank and the rule triggers a state change, the status monitor line resets to normal display. If the rule does not trigger a state change and you want the monitor line reset to normal display, specify ##RESET## in the field.

You can use the Severity field in the Extended Display Attributes window to determine whether an extended display can be overwritten by another extended display. When an extended display is invoked, it can overwrite a display of equal or lesser severity only. The field ensures that the monitor displays the most severe condition. The greater the value in this field, the lesser the severity. For example, 9 is less severe than 1.

An operator, using the status monitor, can enter the primary command EXTDISP ON to display override text on the monitor or EXTDISP OFF to display standard message text. The default is to display override text.

How You Override the Display Attributes

Use the Extended Display Attributes window to specify the display attributes and how an icon on the graphical monitor is affected by the attributes.

- Normally, the display attributes of a status line on a status monitor are determined by the logical state of the relevant resource. By using the fields in this window, you can override the normal display attributes.
- An icon on the graphical monitor displays the status of the resource that is in the worst logical state. The Use on Graphic Monitor? field enables you to indicate whether the specified extended display color should be used on an icon.

  If you do not want the icon to use the specified extended display color, specify **NO** (the default) in the Use on Graphic Monitor? field. For example, if the resource does not require attention, transferring the color to the icon can cause an undesirable change in the icon color.

  If you want the icon to use the specified extended display color, specify **YES** in the Use on Graphic Monitor? field. This setting also forces the state ranking of the resource to equal that of the FAILED logical state. The icon can thus be forced to display this resource even though it is not in the worst logical state. For example, if you rate the condition of a tape mount request very important, specify **YES** in the Use on Graphic Monitor? field.

How You Use the User-defined Keyword

The keyword is used by status monitor filters to determine whether to display the status of a resource on the basis of the processed message.

For example, you may want to suppress the display of a resource on the status monitor when a particular message is detected. To do this, specify a keyword in the rule for that message and use the keyword as a criterion in a status monitor filter to *not* display the resource. When an operator uses the filter to view the resources on the status monitor, the resource is normally displayed on the monitor. However, if a message arrives and satisfies this message rule, the resource disappears from the monitor because the keyword in the filter tells the monitor *not* to display the resource.

How You Use User-defined Variables

Use the User Defined Variables window to specify data that can be used within an icon definition. The data is only available when the resource for which the data is defined has the worst status of all resources within an icon.

Event Documentation

Use the Event Documentation panel to record information about a message rule. For example, you may want to document what causes a particular ABEND message.

$NCL Process—Execute an NCL Procedure

$NCL is a special process definition that is applicable across all defined system images. The $NCL process enables you to execute an existing NCL procedure directly. You do *not* need to define a process to execute an NCL procedure. The $NCL process return code inherits the return code set by the NCL procedure.

The process has the following format:

`$NCL $NCL=ncl_procedure_name parameter_1=value_1 … parameter_n=value_n`

$NCL=*ncl_procedure_name*

Names the NCL procedure.

parameter_1=value_1 ... parameter_n=value_n

(Optional) Specifies parameter values to the NCL procedure.

Limits: Keyword format with parameter names not starting with $

Example: NAME=*resource_name*

Note: You cannot use the $NCL process from within another process. To execute an NCL procedure from within a process, use the EXECNCL macro.

Create User-defined Resource Subclasses

Note: This section applies only to CA NetMaster FTM, CA NetMaster NA, CA SOLVE:Operations Automation, and CA SOLVE:Operations Automation for CICS.

User-defined resource subclasses enable you to categorize resources in a class defined by you. You use resource subclasses to categorize resources that do *not* belong to any of the supplied resource classes.

You can monitor and control the resources in the subclasses from the monitors. You can define resource templates for the resource subclasses.

You use the USRCLS resource class when you define resources for resource subclasses. The User Class field of the resource definition determines the resource subclass. A resource subclass is a resource type in the USRCLS resource class.

Initially, the User Class field has one valid value, LOGICAL (indicating a logical resource). To define resources for your own subclasses, you must first define the subclasses in the User Classes field prompt list. The name of a resource subclass can be up to eight characters long.

Note: When your status monitor displays resources of the USRCLS class, you do *not* see USRCLS as a resource class. The resource subclasses are displayed instead.

To add a new user subclass in the User Classes field prompt list

1. Enter **?** in the User Class field on the User Class Resource General Description panel.

   The User Classes field prompt list appears.

2. Press F10 (EditList).

   The list is updated.

3. Press F4 (Add).

   The Field Prompt Entry Definition panel appears.

4. Define the new user subclass, then press F3 (File).

   The subclass is added to the list.

Logical Resources

The function of some resources is purely to elicit some sort of activity from another resource (for example, starting or stopping other resources). Other resources might be logical representations of groups of resources. Define these types of resources as the LOGICAL resource type.

Note: The name of a logical resource must contain alphanumeric, @, #, $, ., :, -, (, and) characters only. It must not be a number.

Logical resources respond to some actions differently from the other types of resources.

Logical resources respond to the displaying action as follows:

- If no command or process exists for the action, the actual state of the resource is set according to the operation mode:
  - In the AUTOMATED operation mode, a displaying action sets the actual state of the resource that is opposite to the value of the desired state to drive automation.
  - In the MANUAL operation mode, a displaying action sets the actual state of the resource to the value of the desired state.
- If a command or process exists, the region uses the command or process to set the actual state of the resource.

Logical resources respond to the starting, stopping, and forced stopping actions as follows:

- If no command or process exists for the action, the actual state of the logical resource is set to the expected result of the action. A starting action results in an ACTIVE actual state; a stopping action results in an INACTIVE actual state.
- If a command exists and no time-out processing is specified, the region issues the command and then *immediately sets the actual state of the logical resource to the value of the desired state*.
- If a command exists and time-out processing is specified, the time-out settings (see page 135) determine the final status of the resource.
- If a process exists, the region acts the same way as for other resources (that is, the region responds according to the process return code).

Define Resource Relationships

The resources monitored by some products can have relationships. When you have defined those resources in a system image, you can specify the relationships between them. For each resource, you can specify two different relationships (see page 146) from it to other resources.

The region uses the relationship information during automated system startup and shutdown to determine the order in which to start or stop the defined resources.

You can define relationships between different types of resources in a system. The relationships between resources can be different for each system image definition held in the knowledge base.

A relationship consists of two parties: parent and child.

During automated operation, a parent must be active before dependent resources (its children) can be started. A child cannot be started automatically unless all its parents are active.

Similarly, a parent cannot be stopped automatically unless all its children are inactive.

You can use the GRT command to display resource relationships from the status monitor, the graphical monitor, and the System Image List.

To relate a resource to other resources

1. Enter **/RADMIN.R** at the prompt.

   The Resource Definition panel appears.

2. Enter **S** next to the resource class.

   The resource list appears.

3. Enter **R** next to the resource that you want to relate.

   The Existing Relationships List displays any relationships already defined for the resource.

4. Press F11 (Relate).

   A selection list of the resource classes appears.

5. Select the class of resource to which you want the selected resource to relate.

   A list of all resources of that class in the system appears.

6. Enter **C** or **P** next to a resource to define it as a child or parent.

   The updated list of resource relationships appears.

7. Press F3 (Exit).

   The Existing Relationships List appears.

Note: You can enter **R** next to a resource to display its other relationships. If you want to break a relationship with a resource, use the Unlink action codes.

Primary and Alternate Relationships

For each resource, you can define a primary relationship and an alternate relationship with other resources. During startup and normal operation, the region uses the primary relationship. During shutdown, the region uses the relationship specified in the OPSYSIDS parameter group. The default is the primary relationship. You can override this value when you issue the SHUTSYS and SHUTFORCE commands.

To access the list of parameter groups, enter the **/PARMS** shortcut.

Effect of Resource Relationships on Operations

Resource relationships affect systems operations in the following ways, depending on the resource operation modes:

Start a System That Contains Only Automated Resources

During system startup, the region starts all the resources without parents first, then the children, level by level, until all resources are started.

Resources are started subject to the availability requirements defined in the resource availability maps.

Stop a System That Contains Only Automated Resources

During system shutdown, the region stops its resources in an order that is the reverse of the startup sequence. The resources are stopped level by level up the relationship tree.

Start a System That Contains Automated and Manual Resources

The region starts resources in the same order, as when starting a system that contains only automated resources (see page 147). However, when it encounters a resource in the MANUAL or IGNORED operation mode, the region does not start the resource or any of its children, even if the children are in the AUTOMATED operation mode. The region starts all other automated resources. Manual resources are started manually. Once a manual resource becomes active, the starting sequence continues with its children automatically.

Automated resources are started subject to the specified availability requirements.

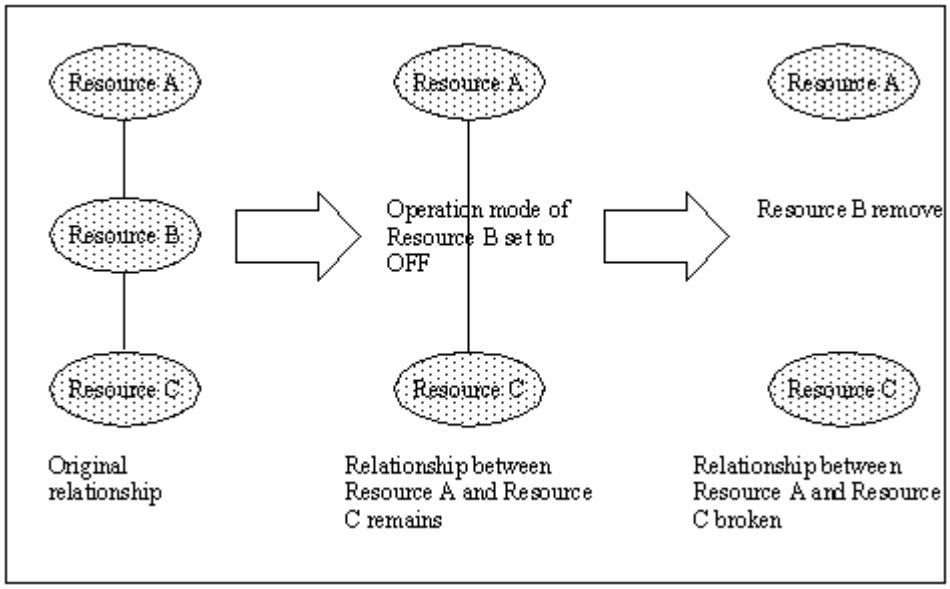
Stop a System That Contains Automated and Manual Resources

The region stops the resources in the same order as when stopping a system that contains only automated resources. However, when it encounters a resource in the MANUAL or IGNORED operation mode, the region does not stop the resource or any of its parents, even if the parents are in the automated operation mode. The region stops all other automated resources. Manual resources are stopped manually. When a manual resource becomes inactive, the stopping sequence continues with its parents.

Note: The SHUTFORCE command lets you stop all of the resources defined in an active system image, irrespective of the operation mode. Before stopping the resources, the command sets all MANUAL or IGNORED operation modes to AUTOMATED operation modes.

Effect of a Resource Set to the OFF Operation Mode on a Relationship

The following illustration shows the effect that a resource set to the OFF operation mode has on a relationship. As a comparison, the illustration also shows the effect of removing a resource definition from the relationship.



Staged Image Load and Shutdown

If you want to stage your image load or shutdown so that an operator can confirm whether to continue at strategic points in the process, create USRCLS resources in the shutdown and startup relationship chain that run a simple WTOR process as their activation and deactivation processing. Depending on the operator response to the WTOR, you can set the resource to inactive or active or take other action. Use the Timeout option to set a default action.

System Load Balancing

In a multisystem environment, you might want to balance the load on the systems by moving the control of certain shared resources from one system to another. The MV and MVT commands enable operators to perform that task. These commands operate on resources in local system images, and shared system images if your product supports them.

How MV and MVT Commands Move the Operation of a Resource

During a move operation, the following actions occur:

1. If the operation mode of the resource is AUTOMATED, it is set to MANUAL.
2. The resource is stopped or inactivated in the current system.
3. Control of the resource is transferred to the target system depending on whether the resource is in a local system image or shared system image.

For resources in local system images:

Note: For a successful move operation on a local resource, the resource must also be defined in the target system image.

1. The operation mode of the resource is set to OFF, removing the resource from the monitors. The current system no longer has control of the resource.
2. The resource is activated on the target system (unless it is INACTIVE and AUTOMATED). You can override this action, individually or for all resources.
3. The MANUAL override is removed, but not if the resource was INACTIVE and AUTOMATED, and you requested activation.
4. The operation mode of the definition in the target system image is set to the value before Step 1. The status of the resource is redisplayed under the target system image. The target system has control of the resource.

For resources in shared system images:

1. The resource is activated on the target system (unless it is INACTIVE and AUTOMATED). You can override this action, individually or for all resources.
2. The home system of the resource is changed to the target system. You can override this action, individually or for all resources.
3. The MANUAL override is removed, but not if the resource was INACTIVE and AUTOMATED, and you requested activation.

Define Shared Resources in Local System Images

For the MV and MVT commands to be successful, you should define the shared resources to the affected local system images.

Note: If your product supports shared system images, you do not need to perform this procedure.

To define shared resources

1. Define the required resources to the system image that normally controls those resources.

   The resources are defined for normal operation.

2. Duplicate the relevant resource definitions, resource relationships, availability map, and processes to the system images that you want to include in the set of load sharing systems.

   Note: The MV and MVT commands use the specified class and name in a definition to identify the resource. You do not need to duplicate the other information if you do not want to.

   The resources are defined to the load sharing systems.

3. Set the operation mode of the duplicate resource definitions to OFF.

   These definitions are initially dormant.

4. If a resource is part of a service, specify all systems for that resource in the service definition.

   The service is then able to track that resource as it is moved from system to system.

Resource Definition Maintenance

You can browse, update, copy, and delete resource definitions from the resource list.

Notes:

- Resources of the INTNL class with names in the form *xx*(*) are dynamic APPC resources that provide communications between regions. These resources are defined only for the duration of the APPC link. Do *not* change these resource definitions.
- If you only want to hide a resource definition from the region, set the operation mode or monitoring activity to OFF. The definition remains in the knowledge base but is not used.

When you copy a resource definition, the associated availability map and local processes are treated as follows if the map or process of the same name already exists in the target system image:

- For an availability map, you are prompted to indicate whether you want to replace the existing map.
- For a local process, the existing process is *not* replaced.

Chapter 10: Backing Up the RAMDB

This section contains the following topics:

Database Maintenance

The method you select for performing database maintenance depends on the configuration of your regions and your operations requirements.

Backup methods depend on whether your regions are:

- Unlinked, nonproduction regions
- Unlinked production regions
- Linked production and nonproduction regions

Back Up Unlinked Nonproduction Regions

To back up unlinked nonproduction regions

1. Stop the region.
2. Back up the database.
3. Restart the region.

Back Up Unlinked Production Regions

If the region cannot be shut down for database backup, we recommend that you back up unlinked production regions as described here.

To back up unlinked production regions

1. Create a duplicate region with its own knowledge base.

   Important! Ensure that the databases of the duplicate region are not on the same DASD as the production region databases.

   Note: If the region supports shared system images, create the duplicate on a different system. You cannot link regions that support shared system images if those regions are on the same system.

2. Use the Link Region and Synchronize Database option (on the Multi-System Support Menu) to link the duplicate region to the production region.

   The databases of the production region are copied to the duplicate region.

3. (Optional) In the duplicate region, switch off console consolidation in the CCONSOLIDATN parameter group (shortcut **/PARMS**).

4. Load an empty system image with no EventView rule set.

   Note: The duplicate region does not perform any automation, it simply contains an up-to-date, mirror image of the production databases.

5. When the backup is required, stop the duplicate region and perform the backup to tape.

Note: Any database updates that occur while the duplicate region is stopped are held by the staging file. The updates are sent to the duplicate region when it is restarted.

Back Up Linked Regions

Each region contains a copy of the database of each linked region. Updates to any database are immediately propagated to the databases of each linked region.

If backups to tape are required, and linked regions cannot be shut down, we recommend that you back up linked regions as described here.

To back up linked regions

1. Create a duplicate region, and link it to the production region.
2. Stop the duplicate region, and perform the backup to tape.

Note: Any database updates that occur while the duplicate region is stopped are held by the staging file. The updates are sent to the duplicate region when it is restarted.

EXPORTRM Utility—Export Definitions

The EXPORTRM utility exports one of the following types of definitions:

- A system image with the included resource definitions
- A service image with the included service definitions
- An EventView rule set with the included rules
- A class of common components

The utility does not support the selection of individual definitions.

The export data set must exist as a sequential file with a record length of at least 80 characters. You can use DISP=MOD to append multiple exports to a single data set.

This utility has the following format:

```
EXPORTRM DSNAME=data_set_name [DISP=MOD]
       {[OPT=IMAGE SYS=system_image_name VER=version] |
        [OPT=SERVICE VER=version] |
        [OPT=RULESET RULESET=rule_set_name] |
        [OPT=COMMON TYPE=component_type [VER=version]]}
```

DSNAME=*data_set_name*

Specifies the name of the export data set.

DISP=MOD

Appends the exported definitions to a data set that already has data. By default, the utility overwrites existing data.

Note: You can export only one type of component on each execution of the utility. With DISP=MOD, you can include the data from multiple executions of the command in the same data set.

OPT=IMAGE

Exports the specified system image and its resource definitions.

SYS=*system_image_name*

Specifies the name of the system image.

VER=*version*

Specifies the version of the system image.

OPT=SERVICE

Exports the specified service image and its service definitions.

VER=*version*

Specifies the version of the service image.

OPT=RULESET

Exports the specified rule set and its rule definitions.

RULESET=*rule_set_name*

Specifies the name of the rule set.

OPT=COMMON

Exports the specified components.

TYPE=*component_name*

Specifies one of the following types of components:

- AFILT for Alert Monitor filters
- ATTR for display attribute tables
- CCPROF for Consolidated Console profiles
- CMD for command definitions
- GPROCESS for global processes (Use VER to specify a version other than 0001.)
- ICON for icons
- ICONPANL for icon panel definitions
- MACRO for macro definitions
- PROFILE for user profile definitions
- PROMPT for field prompt lists
- RESGRP for resource groups
- SFILT for Status Monitor filters

Example: Export a System Image

This example exports a system image to the CO001.SOP001.KB251110 data set. If the data set contains data, the data is overwritten.

```
EXPORTRM DSNAME=CO001.SOP001.KB251110
         OPT=IMAGE SYS=SYS001 VER=0001
```

Example: Export Status Monitor Filters

This example exports the Status Monitor filters to the same data set used in the previous example, appending the new data.

```
EXPORTRM DSNAME=CO001.SOP001.KB251110 DISP=MOD
         OPT=COMMON TYPE=SFILT
```

IMPORTRM Utility—Import Definitions

The IMPORTRM utility imports definitions in a data set to the knowledge base. The data set contains definitions exported by the EXPORTRM utility.

This utility has the following format:

```
IMPORTRM DSNAME=data_set_name
         MODE={REPLACE|OVERLAY|MERGE}
```

DSNAME=*data_set_name*

Specifies the name of the export data set.

MODE={REPLACE|OVERLAY|MERGE}

Specifies how the imported definitions are applied in the RAMDB knowledge base.

- REPLACE deletes the relevant existing definitions in and copies the imported definitions to the knowledge base.

  For example, while importing Version 0001 of the SYS001 system image that exists in the knowledge base, the utility deletes the entire existing image and copies the imported image.

- OVERLAY adds definitions that do not exist and updates existing definitions. This mode does not delete existing definitions.

- MERGE adds definitions that do not exist. This mode does not affect existing definitions.

Chapter 11: Reporting on Your RAMDB

This section contains the following topics:

About Reporting

The reporting facility lets you search your knowledge base by specifying certain criteria to retrieve any definitions that match those criteria. For example, you may want to make a change to a macro and you need to find out what other parts of your system are affected by the change.

You can also update the retrieved definitions. For example, you may want to change all references to a macro. You can search for the macro and retrieve the relevant definitions, including the processes that reference the macro. You can then update those processes to refer to the required macro.

The following report formats that can be generated:

List

Provides a selection list of output in summary form.

Print

Prints detailed information.

Generate a Report

A report is generated by performing a search with specified criteria.

To generate a report

1. Enter **/ASADMIN.R** at the prompt.

   The Reporting menu appears.

2. Enter *one* of the following at the prompt to specify the type of report that you want:

   - **B:** Displays the output as a selection list with summary information from which you can browse, update, or copy.
   - **P:** Prints the output with detailed information.

   The CAS: Lists panel appears.

3. Enter **S** next to the search criteria that you want.

   Each criteria selection displays a panel for you to specify search parameters. See the following sections for a description of how to specify the search parameters for the criteria you have chosen.

   Note: Enter **I** next to any of the listed criteria to get more information about the type of search it performs.

Search for Macros

If you selected the Search for Macro References criteria, the Search for Macro panel displays.

The macro search lets you retrieve macros that satisfy specified criteria.

To search for macros

1. Complete the following fields to specify one or more search parameters:

   Macro Name

   Specifies a macro name or a mask. For example, *VAR* specifies macro names that contain VAR.

   NCL Procedure

   Specifies the name of an NCL procedure or a mask. For example, $RMMC2* specifies NCL procedure names that begin with $RMMC2.

   Macro Description

   Specifies a string of text to search for in macro descriptions.

2. Press F6 (Action).

   The output is printed or listed depending on what type of report you specified.

Search for Message Rules

If you selected the Search for Message Rules criteria, the Search for Message Rule panel displays.

The message rule search lets you locate all message rules that match the specified criteria.

Note: The fields do not support masks. For example, using IEC03* as the rule ID does not retrieve all rules with IDs that begin with IEC03. Instead, the criterion retrieves only those rules with message texts that have a first word of IEC03*. The asterisk (*) is interpreted as a real character, not a wildcard.

To search for message rules

1. Specify one or more search parameters using the fields provided.

   The fields are a subset of the fields that are displayed when you define message rules. Press F1 (Help) for a description of the fields.

2. Press F6 (Action).

   The output is printed or listed depending on what type of report you specified.

Search for Processes

If you selected the Search for Process References criteria, the Search for Process panel displays. The process search lets you locate all processes that match the specified criteria and the definitions in the knowledge base where the processes are referenced. Processes are referenced in availability maps, resource definitions, or message rules.

To search for processes

1. Complete the following fields to specify one or more search parameters.

   System Name

   Specifies the name of a system image.

   Version

   Specifies the version of the system image.

   Process Name

   Specifies the name of a process or a mask. For example, DISP* specifies process names that begin with DISP.

   Process Description

   Specifies a string of text to search for in process descriptions.

   Note: We recommend that you specify a system name and version when performing the process search.

2. Press F6 (Action).

   The output is listed or printed depending on the type of report you specified.

How You Use Your Search Output

If you have chosen to list the output of your search, you can browse, update, or copy any entry in the selection list. You can also issue the SORT and LOCATE commands to help you view and find information in the list.

If you have chosen to print your search output, you can hold the output and view it online before printing.

Note: For information about using the print services manager, see the *Administration Guide*.

Sort Your Output

To sort the output in the selection list

1. Enter **SORT ?** at the prompt.

   A list of sort criteria appears.

2. Enter the number of the sort criterion you want at the prompt.

   The search selection list with the SORT command and the criteria displayed at the command prompt appears.

3. Press Enter.

   The list is sorted.

Locate Output

You can use the LOCATE command to find specific entries in your search selection list. The command is performed on the field on which you sorted.

Example: Find a Process

To find the process $PROC01 in your search selection list

1. Enter **SORT $RM00NAME** at the prompt to sort the list by the object name.
2. Enter **L $PROC01** to locate the specified process.

Chapter 12: Defining Macros

This section contains the following topics:

Understanding Macros

A macro is an NCL procedure used to construct process steps. Sample macros are provided, but you can also write your own NCL procedures and use them as macros. Your NCL procedure must be manually distributed to linked regions. To enable the system to recognize an NCL procedure as a macro, you must register the macro.

Note: For more information about using macros, see the *User Guide*.

NCL Procedures as Macros

A typical NCL procedure to be used as a macro must have the following features:

- Contain a brief description of the purpose of the procedure.
- Display panels that allow users to browse or change certain parameters used by the procedure. These parameters are displayed when a user applies the **P** (Parameters) action.
- Perform the required function when a process executes the macro.
- Return a code that a user can test to determine what the processing requirements are for later process steps.

The following macro template procedures are provided in CC2DEXEC for you to customize to suit your requirements:

- $RMMC00S, which executes macro actions
- $RMMC00D, which handles parameter definitions

How You Customize the $RMMC00S Macro Template

You need to set the value of #RMMACRO (that is, the macro name), then you need to customize the subroutines introduced by the following labels:

- SHORTDESC (optional)
- LONGDESC (optional)
- PARMHELP (optional)
- EXECMACRO (*mandatory*)

Further customization can be performed, but these are the recommended minimum changes to the $RMMC00S template.

Note: For examples of how this template is used, see other $RMMC*nn*S members in the CC2DEXEC data set.

How You Customize the $RMMC00D Macro Template

If you want parameter validation to work correctly, customize the subroutines introduced by the following labels:

- PINIT
- PSET
- PSAVE
- VMANDATORY

Further customization can be performed, but these are the recommended minimum changes to the $RMMC00D template.

Note: For examples of how this template is used, see other $RMMC*nn*D members in the CC2DEXEC data set.

Macro Registration and Maintenance

To enable an NCL procedure to be used as a macro, register the macro by creating a macro definition for the procedure. Use the Macro Definition panel to define and maintain macros.

Access Macro Definitions

To access macro definitions, enter /**ASADMIN.M** at the prompt.

The Macro List appears.

Add Macro Definitions

To add a macro definition

1. From the Macro List, press F4 (Add).

   The Macro Definition panel appears.

2. Complete the following fields:

   Macro

   Specifies the name of the macro.

   NCL Procedure

   Specifies the NCL procedure that this macro represents.

   Press F3 (File).

   The macro definition is saved.

Note: You can later update a macro definition so that it points to a different NCL procedure. The NCL Procedure field is the only field on the panel that can be updated.

Macro Definition Panel

The Macro Definition panel records macro details and identifies the NCL procedure represented by the macro. Depending on the operation you are performing, some or all of the fields on this panel may be modified. Press F1 (Help) for information about the fields.

Chapter 13: Defining Automation Services Commands

This section contains the following topics:

Automation Services Commands

A command is an NCL procedure that performs specific processing. Automation Services comes with a predefined set of commands.

Commands can be generic (that is, perform processing that is not related to a specific resource or service) or can apply to a class, to a type within a class, or to a specific resource or service. A more specific command has precedence over a less specific command.

You can define your own commands to perform site-specific processing by writing an NCL procedure and associating it with a command definition. Supplied command definitions can be modified to suit your requirements.

To execute commands programmatically from a batch process, exit procedure, console, or external application, use the $RMCALL API procedure.

Command Registration and Maintenance

Automation Services does not recognize commands unless they are registered by using the command definition facility.

Use this facility to register your own command definitions and to maintain command definitions supplied with Automation Services.

Access Command Definitions

To access command definitions, enter /**ASADMIN.C** at the prompt.

The Command List appears. This panel lists all of the commands that are currently defined, the type of resource or service to which each command applies, and a description of the command. Special classes include ALL, ALL-X, INC, and NONE.

Note: For more information, press F1 (Help).

Add and Maintain Command Definitions

The command definition facility provides the following panels for you to specify information about commands:

- Command Details (see page 171)
- Prompting, Confirmation and Validation (see page 172)

To add a command definition

1. Enter /**ASADMIN.C** at the prompt.

   The Command List appears.

2. Press F4 (Add).

   The Command Details panel appears.

3. Complete the fields as required.

   Note: For more information, press F1 (Help).

4. (Optional) Press F8 (Forward).

   The Prompting, Confirmation and Validation panel appears.

5. (Optional) Complete the fields as required.

6. Press F3 (File).

   The command definition is saved.

Note: If you want to define a line command, the name can only be three characters long.

Command definitions can also be browsed, updated, copied, or deleted from the Command List panel.

Command Details

The Command Details panel specifies the following:

- The name and description of the command
- Whether the command applies to a class, a type in a class, or a specific resource or service

  Note: For duplicate commands, the region applies the command according to their scope. For example, if you enter A next to an SNA resource, the A command with the class scope of SNA takes precedence over the A command with the class scope of ALL-X.
- The user ID under which the command executes
- Whether the command is executed on remote or local region
- The name of the NCL procedure that performs the processing associated with the command, and the names of any parameters passed to this procedure
- The URL or Java class invoked to perform the processing associated with the command in WebCenter, and the parameters required. To specify a URL, the line must start with URL:. To specify a Java class, the line must start with Java.

Example: Command Details Panel

This example shows a Command Details panel in Browse mode.

Note: For more information, press F1 (Help).

```
PROD1-------------- Automation Services : Command Details -----------$$CMD-0000
Command ===>                                                    Function=BROWSE

- Command Identification and Scope ---------------------------------------------
|                                                                               |
| Name ... A          Description ... Activate a Resource                       |
|                                                                               |
| Class ...+ ALL      Type ..........             Name ..                       |
|                                                                               |
---------------------------------------------------------------------------------
- Execution Details -----------------------------------------------------------|
|                                                                               |
| Command Userid ..+ *      Execute on Remote? ... YES (YES or NO)              |
|                                                                               |
| NCL Procedure .... $RMCONS LCMD=A SYSNAME=&ZRMDBSYSNAME                       |
|                                   VERSION=&ZRMDBVERSION                       |
|                                   CLASS=&ZRMDBCLASS                           |
|                                   NAME=&ZRMDBNAME                             |
|                                                                               |
| Web Action ....... JAVA:com.ca.syd.statusmonitor.gui.StatusMonitorConfirmCo   |
|                    mmandHandler                                               |
---------------------------------------------------------------------------------
```

Command Prompting, Confirmation, and Validation

The Command Prompting, Confirmation, and Validation panel is used to specify the following:

- Whether the user is prompted, the type of prompting, and if parameters required by the command are not supplied.
- Whether confirmation is required before the command is executed and the name of the (optional) confirmation exit procedure that performs the confirmation.
- The name of the (optional) validation exit procedure that performs validation on command parameters.

Example: Prompting, Confirmation and Validation Panel

This example shows the command Prompting, Confirmation and Validation panel in Browse mode.

Note: For more information, press F1 (Help).

```
-------- Automation Services : Prompting, Confirmation and Validation ---------
Command ===>                                                  Function=BROWSE

. Prompting ------------------------------------------------------------------.
|                                                                              |
| Type of Prompting Required ... RESOURCE  (SYSTEM, RESOURCE or NONE)          |
|                                                                              |
| SYSTEM   prompts for System Name and Version if not provided                 |
| RESOURCE prompts for System Name, Version, Class and Name if not provided    |
| NONE     defaults to the local System Name and Version if not provided       |
'------------------------------------------------------------------------------'
. Confirmation ---------------------------------------------------------------.
|                                                                              |
| Does This Command Require Confirmation? ... YES  (YES or NO)                 |
| Confirmation Exit ...                                                        |
|                                                                              |
'------------------------------------------------------------------------------'
. Validation -----------------------------------------------------------------.
|                                                                              |
| Validation Exit .....                                                        |
|                                                                              |
'------------------------------------------------------------------------------'
 F1=Help      F2=Split     F3=Exit      F4=Edit
 F7=Backward              F9=Swap                 F11=Panels
```

How You Define Your Own Commands

You can define your own commands to perform specialized processing. The process has the following stages:

1. Write an NCL procedure that performs the processing that you want your command to perform.
2. Register the command to Automation Services (see page 169).
3. Manually distribute the procedure to linked regions or place it in a shared library, accessible to all systems.

You can register different versions of a command with the same name. Automation Services executes the version that best fits the resource or service the command is applied to.

For example, you can register two versions of a command with the name Z, where version one applies to all resources, and version two applies to started tasks only. When the Z command is applied to a started task, Automation Services executes version two of the command.

How You Code Your NCL Procedure

Code your NCL procedure to set RETCODE=0 to indicate successful completion—a non-zero return code indicates a processing failure. You can return a message from the procedure by setting the &SYSMSG variable.

Note: For more information about NCL programming, see the *Network Control Language Programming Guide* and the *Network Control Language Reference Guide.*

Commands That Execute on Remote Systems

If a command relates to a resource or service on a remote system, you can set the Execute on Remote? field to YES. The NCL procedure associated with the command will then execute on the remote system.

If the command requires a presentation space (that is, the command displays information to the user who issued it), set the Execute on Remote? field to NO. In this case, your NCL procedure must extract data from the remote system and present it on the local system. The name of the system where the data is sourced is stored in the variable ZRMCMDLINK.

Variables Available to a Command NCL Procedure

The following variables can be used in an NCL procedure associated with a command, to pass data required by the command:

ZRMSYSNAME

Contains the name of the system to which the command is to be applied.

ZRMVERSION

Contains the version number of the system to which the command is to be applied.

ZRMCMDUSERID

Contains the user ID of the person who issued the command.

ZRMCMDLINK

Contains the name of a link (which is, in fact, the ACB name of the target region) that will route a command to a region. The ZRMCMDLINK variable contains the ACB name of the current region if the command is not to be routed to a different system.

ZRMCMDPARMS

Contains any command parameters specified by the user. Parameters are in the format parameter=value, separated by spaces. This enables you to override default values.

ZRMDB*

Knowledge base variables (see page 406) have the prefix ZRMDB. If the command is to be applied to a resource or a service defined in the knowledge base, the command procedure needs access to relevant values stored in knowledge base variables. One or more of the following four variables is likely to be required:

ZRMDBSYSNAME

Contains the name of the system image where the resource is defined if the command refers to a specific resource or service.

ZRMDBVERSION

Contains the version number of the system image where the resource is defined if the command refers to a specific resource or service.

ZRMDBCLASS

Contains the class name of the resource or service to which the command is to be applied.

ZRMDBNAME

Contains the name of the resource or service to which the command is to be applied.

ZRMST*

Status variables (see page 410) have the prefix ZRMST. If the command is to be applied to a defined resource or service, the command procedure needs access to relevant values stored in status table variables.

ZMSG*

Message variables (see page 412) have the prefix ZMSG. If the command is to be executed as a result of the receipt of a particular message, the command procedure needs access to relevant values stored in message variables.

Chapter 14: Customizing the Display Attribute Tables

This section contains the following topics:

Display Attribute Tables

Display attribute tables list the following:

- The range of possible logical states for resources and services
- The display attributes that are used by the status and graphical monitors to show the logical state of resources and services

Edit a Display Attribute Table

To edit and customize the information in these tables

1. Enter **/ASADMIN** at the prompt.

   The Administration Menu appears.

2. Select option **A** - Display Attribute Tables.

   The Panel Display List appears.

3. Select the table that you want to edit.

   The table appears.

4. Press F4 (Edit), and edit the attributes.

5. Press F3 (Exit).

   The changes are saved.

Important! When you change a display attribute table, this change is not reflected immediately. Changes are applied to individual resources and services when an event arrives that forces an update of the resource or service status. This process can result in a monitor displaying a mixture of old and new attributes. To avoid this situation, issue the CHECKALL command from the resource or service monitor immediately after changing the display attributes tables. This command forces the generation of events for all resources and services, and all status displays are updated.

Logical State Attributes Table

The Logical State Attributes Table displays the attributes used by the status and graphical monitors to show the logical states of resources and services. The logical state of a resource or service is derived from the values defined in the Automated and Manual Mode display attribute tables.

The display attributes used in this table are as follows:

- Rank in severity
- Intensity
- Color
- Highlighting

Example: Logical State Attributes Table

This example shows a logical state attributes table:

```
PROD-------- Automation Services : Logical State Attributes Table --$$ATTR-0000
Command ===>                                                    Function=BROWSE


          .-----------+------+-----------+-----------+-----------.
          | STATE     | RANK | INTENSITY | COLOR     | HIGHLIGHT |
          +-----------+------+-----------+-----------+-----------+
          | UNKNOWN   | 001  | LOW       | WHITE     | NONE      |
          | INERROR   | 002  | HIGH      | WHITE     | REVERSE   |
          | FAILED    | 003  | LOW       | RED       | NONE      |
          | ATTENTION | 004  | LOW       | PINK      | NONE      |
          | DEGRADED  | 005  | LOW       | YELLOW    | NONE      |
          | PENDING   | 006  | LOW       | TURQUOISE | NONE      |
          | STARTING  | 007  | LOW       | BLUE      | NONE      |
          | STOPPING  | 008  | LOW       | BLUE      | NONE      |
          | OK        | 009  | LOW       | GREEN     | NONE      |
          '-----------+------+-----------+-----------+-----------'
```

To display resources with a logical state of INERROR in red and reverse video at high intensity, you assign the following values:

- INTENSITY is HIGH.
- COLOR is RED.
- HIGHLIGHT is REVERSE.

Note: Your region uses the blinking highlight attribute to display a resource when an automated action is being performed on the resource. We recommend that you do *not* use the BLINK highlight attribute.

Automated Mode Attributes Table

The Automated Mode Attributes Table lists the logical states assigned to resources and services in Automated mode. The logical state is based on a combination of the mode, the desired state, and the actual state. The valid logical states are listed in the Logical State Attributes Table.

Logical States for the Automated Mode

Logical states are set to describe the situation. For example, the actual state of a resource is INACTIVE and the desired state is ACTIVE. In automated mode, Automation Services tries to bring the actual state to ACTIVE. Use the PENDING logical state to indicate that the resource is in the process of becoming active.

Using the settings in the Logical State Attributes Table panel shown previously as an example, a resource that is PENDING is displayed in low intensity turquoise.

Example: Automated Mode Attributes Table

This example shows an Automated Mode Attributes Table.

```
PROD-------- Automation Services : Automated Mode Attributes Table -$$ATTR-0000
Command ===>                                                      Function=BROWSE

                .-----------+-------------------------.
                |           |      DESIRED STATE      |
                | ACTUAL    +-------------+-----------+
                | STATE     | ACTIVE      | INACTIVE  |
                +-----------+-------------+-----------+
                | ACTIVE    | OK          | PENDING   |
                | STARTING  | OK          | INERROR   |
                | STOPPING  | INERROR     | OK        |
                | DEGRADED  | DEGRADED    | OK        |
                | INACTIVE  | PENDING     | OK        |
                | FAILED    | FAILED      | INERROR   |
                | UNKNOWN   | UNKNOWN     | UNKNOWN   |
                '-----------+-------------+-----------'
```

Manual Mode Attributes Table

The Manual Mode Attributes Table lists the logical states assigned to resources and services in manual mode. The logical state is based on a combination of the mode, the desired state, and the actual state. The valid logical states are listed in the Logical State Attributes Table.

Logical States for the Manual Mode

Logical states are set to describe the situation. For example, the actual state of a resource is INACTIVE and the desired state is ACTIVE. In manual mode, the operator is required to act. Automation does *not* take place to bring the actual state of the resource to ACTIVE (to satisfy the desired state) without operator intervention. Therefore, use the ATTENTION logical state to indicate to the operator that action is required.

Using the settings in the Logical State Attributes Table panel shown previously as an example, a resource that is in a state of ATTENTION is displayed in low intensity pink.

Example: Manual Mode Attributes Table

This example shows a Manual Mode Attributes Table.

```
PROD--------- Automation Services : Manual Mode Attributes Table ---$$ATTR-0000
Command ===>                                                      Function=BROWSE


                 +-----------+---------------------------+
                 ¡           ¡      DESIRED STATE        ¡
                 ¡ ACTUAL    +-------------+-------------+
                 ¡ STATE     ¡ ACTIVE      ¡ INACTIVE    ¡
                 +-----------+-------------+-------------+
                 ¡ ACTIVE    ¡ OK          ¡ ATTENTION   ¡
                 ¡ STARTING  ¡ OK          ¡ ATTENTION   ¡
                 ¡ STOPPING  ¡ ATTENTION   ¡ OK          ¡
                 ¡ DEGRADED  ¡ ATTENTION   ¡ ATTENTION   ¡
                 ¡ INACTIVE  ¡ ATTENTION   ¡ OK          ¡
                 ¡ FAILED    ¡ ATTENTION   ¡ ATTENTION   ¡
                 ¡ UNKNOWN   ¡ UNKNOWN     ¡ UNKNOWN     ¡
                 +-----------+-------------+-------------+




 F1=Help      F2=Split     F3=Exit      F4=Edit
 F7=Backward  F8=Forward   F9=Swap                 F11=Panels
```

Chapter 15: Customizing the Status Monitor Display Format

This section contains the following topics:

Status Monitor Display Formats

A status monitor display format determines what information is displayed for managed services or resources on the status monitor.

Default formats are supplied with your product. You can modify the default formats or set up other formats to suit your requirements.

Users can select a format by issuing the FORMAT command when viewing the status monitor. They can also update their user profile to set a default format.

Status Monitor Views

The status monitor technology is used by different monitors for different products. Product-specific monitors are known as views. The following table shows supported views.

View Name	Monitor	Support multi-column displays?
CICS	CICS Resource Monitor	Yes
FILETRAN	File Transfer Resource Monitor	No
FTMON	Active File Transfer Monitor	No
IPNODE	IP Node Monitor	No
IPRSC	IP Resource Monitor	No
NCPVIEW	NCP Monitor	No
PRINTER	Printer Monitor	Yes
RESOURCE	Resource Monitor	Yes

View Name	Monitor	Support multi-column displays?
SERVICE	Service Monitor	Yes
TAPE	Tape Drive Monitor	Yes

Multi-column Displays

Some of the views support multi-column displays (up to five columns). The views that support multi-column displays are shown in the table.

In the 1-column display, each line shows one managed item. In the 2-column display, each line shows two managed items. In the maximum 5-column display, each line shows the status of five managed items.

The information shown in each display column is determined by the applied status monitor display format. Default formats are supplied for each of the column displays, but you can define your own formats.

Create a Status Monitor Display Format

To define status monitor display formats

1. Enter **/ASADMIN.L** at the prompt.

   The List Definition List appears.

2. Press F4 (Add).

   The List Description panel appears.

   Note: You can also use the C action code to open a copy of an existing display format definition that you can modify.

3. Complete the following fields:

   Appl ID

   Specifies the ID of the application to which the list belongs. Ensure that the value is $RM.

   List Type

   Specifies the type of list. Ensure that the value is PRIVATE.

   Userid

   Specifies the name of the view. If you are building a format for a view that supports multi-column displays, append a number (from 1 to 5) to COLUMNS to identify the display for which the format is created (for example, COLUMNS1 for a 1-column display). (COLUMNS*n* is the user that owns the format.)

   List Name

   Specifies the name of the format.

   Description

   Describes the format.

   Service Procedure

   Specifies the name of an NCL procedure to execute when displaying a list using this definition. Enter NONE.

   Entry Msg Position

   Specifies the column in which extended display starts.

   Entry Msg Length

   Specifies the width of the extended display as follows:

   - If you want the extended display to be of a specific width, specify the width in columns.
   - If you want to allow the width to extend to the end of the screen, leave the field blank.
   - If you do not want to show the extended display, specify 0.

   Note: Do not change the value of the other fields.

   Press F8 (Forward) three times.

   The List Format panel appears. The panel provides a text editor window.

4. By using the text editor, enter column headings and variables to specify the information to display on the status monitor.

5. Press F3 (File).

   The format is created.

Example: Add an ALLFLDS Format

This example shows the completed List Description panel for the ALLFLDS format.

```
PROD-------------------- CAS : List Description ------------------Page 1 of 4
Command ===>                                                    Function=Add

Appl ID ..............+ $RM
List Type ............. PRIVATE   (PUBLIC or PRIVATE)
Userid ................ COLUMNS1  (Userid if PRIVATE)
List Name ............. ALLFLDS_
Description ........... All status fields monitor format
Title ................. ________________________________________________
Status ................ ACTIVE__        Group ..............+ ____________
Service Procedure ..... NONE____        Data Source ......... ____________
Get All Entries? ...... YES             Exit Name ........... ________

Add Allowed? .......... YES             Help Name ........... ____________
Default Mnemonic ...... B__             Select Mnemonic ..... S__
Entry Msg Position .... 33_             Entry Msg Length .... ___
Present Empty List? ... YES             Auto Refresh Rate ... _____
                                        Heading Sub Char .... ___
Comments .............. ________________________________________________
                        ________________________________________________
                        ________________________________________________
                        ________________________________________________

 F1=Help      F2=Split     F3=File      F4=Save
              F8=Forward   F9=Swap                              F12=Cancel
```

Specify the Status Monitor Display Format

Specify the status monitor display format on the List Format panel.

The following list gives the widths for the five different column displays:

One-column display	75 characters
Two-column display	35 characters
Three-column display	21 characters
Four-column display	15 characters
Five-column display	11 characters

Each column contains five extra positions at the beginning to allow for the command input field. For example, for a one-column display, the width of the format is 75 characters, representing positions 6 through 80 of the status monitor.

For each type of information you want to display on the status monitor, specify a static heading and a variable that contains the required information.

To specify the status monitor display format

1. From the List Format panel, specify the headings. A heading can be up to ten lines. These lines are known as heading lines.
2. Specify the corresponding variables beneath the heading lines. Specify the variables in a single line, known as an entry line.

   If the name of a variable is longer than the data to be displayed, create a shorter alias for the name.

Status Monitor Headings

A heading describes the information being displayed under it. Type the headings as you would like them to appear on the status monitor. A heading can contain up to 10 lines of text.

Status Monitor Variables

The variable contains the information you want to display. You can use any of the status variables. For a list of these variables, see the *User Guide*.

In addition, you can use the following special variables:

&ZRMSTNRMCLDS

Contains the:

- Subclass name for USRCLS class resources
- SNA group type for SNAGRP class resources
- Class name for services and other resources

For more information, see the *User Guide*.

&ZRMSTOVRFLAG

Contains the flag that identifies the status overrides applied on a service or resource.

&ZRMSTXNAME

Contains the resource name. If the resource has an accompanying extended display, the name is prefixed with a plus sign (+).

If the display format hides extended displays, this variable enables you to identify the existence of an extended display, which you can view by entering S beside the resource.

Create Shorter Aliases for Variable Names

The name of a variable can sometimes be longer than the displayed data. You can enter a shorter name and then make that shorter name an alias of the actual name.

To create aliases to variable names

1. From the List Format panel, press F5 (Fields).

   The List Entry Line Fields panel appears.

2. The Entry Line Field column contains the variable name you specified in the display format. Type the corresponding real variable name under the Real Field heading.

3. After you have created the aliases, you can perform one of the following actions:

   - If you want to save the format and exit the format definition panels, press F3 (File).
   - If you want to save the format and remain on the List Entry Line Fields panel, press F4 (Save).
   - If you want to return to the List Format panel, press F5 (Format).

Extended Displays

When extended displays are active, they overwrite the last portion of a formatted display screen. The starting position and the width of an extended display are determined by the values in the Entry Msg Position and the Entry Msg Length fields on the List Description panel (page 1 of the format definition panels).

With a multiscreen display format, extended displays affect the first screen only.

Multiscreen Display Format

You can create a multiscreen status monitor display. A multiscreen display can have up to ten screens, enabling you to display more information on the status monitor. The screens can be accessed by pressing the F11 (Right) or F10 (Left) function keys from the status monitor.

Example: Definition for a Two-screen Display Format

This example contains two screens. Lines 0001 and 0002 define the first screen, and lines 0003 and 0004 define the second screen.

```
PROD----------------------- CAS : List Format ---------------------Page 4 of 4
Command ===>                                    Function=Browse Scroll ===> CSR

Appl ID ... $RM      Type.Userid ... PRIVATE.COLUMNS1       Name ... DSPFMT2P

LINE ----+----10---+----20---+----30---+----40---+----50---+----60---+----70---
**** ****************************** TOP OF DATA ******************************
0001 System   Class    Resource     Desired  Actual     Mode       Logical   Ov
0002 &SYSNAME &CLNO    &NAME        &DSTST   &PHYST     &CURMODE   &NRMST    &O
0003 Resource      Current Mode Reason
0004 &NAME         &ZRMSTMODECU0
**** ***************************** BOTTOM OF DATA ****************************
```

Chapter 16: Maintaining Prompt Lists

This section contains the following topics:

Prompt Lists

You can enter a question mark (?) in any prompted field to display a *prompt list* (that is, a list of valid values for the field). An authorized user can update these prompt lists if necessary.

Access Prompt Lists

To access the field prompt lists, enter /**ASADMIN.P** at the prompt.

The Field Prompt List displays descriptions of all prompted fields, in alphabetical order.

Add a Value to a Prompt List

You can add an entry that will be used generically by a specific resource.

To add a value to a prompt list

1. Enter /**ASADMIN.P** at the prompt.

   The Field Prompt List appears.

2. Enter **S** or **V** (FieldValues) beside the Field Prompt Description to which you want to add a value.

   The Field Prompt Entry List appears, displaying the existing values in the list.

3. Press F4 (Add).

   The Field Prompt Entry Definition panel appears.

4. Enter or modify the fields as required. Use variables, a string of less-than characters (<), or a string of greater-than characters (>) to define resource-specific details such as the resource name. You can also use the underline character (_) to define variables.

   Press F4(Save).

   The new value is saved.

Use of Variables

Variables in a prompt list entry are substituted by their values when you select the entry for the field. You can disable variable substitution if you want the variable to appear in the field, *not* the value of the variable. Variable substitution can be disabled for variables with the formats &ZRM* and &ZMSG*.

To disable variable substitution, replace the ampersand (&) in front of the variable name with the underline character (_). For example, if you specify _ZRMDBNAME in a prompt list entry and select the entry for the field, &ZRMDBNAME is displayed in the field.

More information:

Knowledge Base Variables (see page 406)
Status Variables (see page 410)
Message Variables (see page 412)

Use of Less-than Signs (<) to Represent a Left-justified, Fixed-length Variable Field Value

Some messages contain left-justified, fixed-length fields for resource names. If the name is not the right length, the name is left-justified. To handle left-justified fixed-length fields, use less-than signs (<). Each less-than sign represents one character. (You cannot use variables because variables do not provide padding.) For example, <<<<< represents a five-character field with left justification.

Use of Greater-than Signs (>) to Represent a Right-justified, Fixed-length Variable Field Value

Some messages contain right-justified, fixed-length fields for resource names. If the name is not the right length, the name is right-justified. To handle right-justified fixed-length fields, use greater-than characters (>). Each greater-than sign represents one character. (You cannot use variables because variables do not provide padding.) For example, >>>>> represents a five-character field with right justification.

Update Prompt List Definitions

To update a prompt list definition

1. From the Field Prompt List, enter **U** (Update) next to the prompt list that you want to update.

   The Field Prompt Definition panel appears.

2. Complete the following fields:

   Name

   Identifies the field.

   Description

   Describes the prompt list. This description is displayed on the Field Prompt List panel to identify the prompt list. The description is also displayed as the heading on the Field Prompt Entry List panel, which is displayed when you enter a question mark (?) in a prompted field.

   Exclude Display

   Specifies whether this definition is displayed on the Field Prompt List panel.

   Max Abbreviation Length

   Specifies the length of the abbreviated value of an entry in the prompt list. If you do not want to allow abbreviated values, leave the field blank.

   Limits: 3 to 8.

   Max Value Length

   Specifies the length of the full value of an entry in the prompt list.

   Limits: 3 to 52.

   Max Description Length

   Specifies the length of the description of an entry in the prompt list. If you do not want to allow descriptions, leave the field blank.

   Limits: 3 to 38.

Note: Ensure that the sum of the values in the Length fields results in a string that fits into a single line on the display screens. The string starts at column 7 on the display screens.

Chapter 17: Defining Alert Monitor Actions

This section contains the following topics:

Define Alert Monitor Actions

You can add your own actions to the Alert Monitor. You customize the CC2DEXEC($AMCBCMX) exit to specify your actions.

To define Alert Monitor actions

1. Review the comments in the $AMCBCMX member. These comments describe the syntax rules.
2. Copy the member to TESTEXEC.

   The TESTEXEC data set contains a copy of the exit that you can customize.
3. Customize the copy with your actions.

   The member in TESTEXEC is modified. The new actions become available on the Alert Monitor.

Definition Syntax

The $AMCBCMX exit is in NCL and uses the following subroutines. You define your actions under those subroutines.

SetActions

Describes the actions you want to define. The following variables describe each action. *n* is a number that identifies a set of variables for an action.

&AMNAME*n*

Specifies a unique name for the action.

&AMDESC*n*

Specifies a brief description for the action.

&AMCODE*n*

Specifies the action code, which appears on the list of available actions for the Alert Monitor. Do not duplicate an existing action code.

Limits: One through three characters

InvokeAction

Specifies the action to take. Each action has the following construction:

```
&IF .&#AM#NAME = .action_name &THEN +
   &DO
      &#AM$RC = 0
      ncl_code
   &DOEND
```

action_name

Specifies the name to which the action is associated. This name is as defined in a &AMNAME*n* variable in the SetActions subroutine.

ncl_code

Specifies the code executed for the action. Typically, this code calls an NCL procedure.

Example: Define an Action That Calls an NCL Procedure

This example defines the A01 action code that calls the NCL001 procedure.

```
.SETACTIONS

   &$AM$NAME1 = RUN_NCL001
   &$AM$DESC1 = &STR Run the NCL001 procedure
   &$AM$CODE1 = A01

   …

   &RETSUB 0

.INVOKEACTION

   &#AM$RC = 8

   &IF .&#AM#NAME = .RUN_NCL001 &THEN +
      &DO
         &#AM$RC = 0
         &CALL PROC = NCL001
         &#AM$MSG = &SYSMSG
      &DOEND

   …

   &RETSUB 0
```

Chapter 18: Using Linked Product Regions

This section contains the following topics:

Communication Between Your Product Regions

Your system services provide the following methods to communicate between regions:

- INMC—Inter-Network Management Connection
- APPC—Advanced Program-to-Program Communication

If two or more regions are connected, be aware of which regions are connected and ensure that the links are active when required.

Important! If you use the multisystem operation of Automation Services, all management of INMC links is done internally. In this case, be careful if you use the native INMC control. Manual actions against INMC and APPC links controlled by Automation Services can disrupt multisystem operation.

Display Links

You can display links from a command entry panel.

To display links, enter the following command at the prompt:

`SHOW LINKS TYPE=`*`type`*

type

Specifies the type of link, that is, INMC or APPC.

Note: You can also display INMC links by entering the shortcut **/INMC**. This method displays more information about the links.

How You Link Regions

The INMC feature lets you establish and operate links between regions.

The DOMAIN command is used to define a remote region. The command includes the following:

- The name of the region definition. This value is the same as the name specified by the PRI JCL parameter.
- The access methods that can be used to contact remote regions
- Access method-specific details:
  - For VTAM, the region name is used as the VTAM ACB APPL name.
  - For TCP/IP, a region definition that includes the IP name or the address and port number.

The LINK START command is then used to establish the INMC to the remote region identified by the DOMAIN command.

Inter-Network Management Connection

INMC provides a general-purpose data transport mechanism that allows a region to communicate with one or more regions across a logical link known as an INMC link. An INMC link can be *one* of the following:

- Simple
- Multipath

Simple INMC Links

INMC provides basic functionality, which is suitable for networks where there is only one physical network path between regions. Simple INMC provides the following functionality:

- It allows a region to communicate with one or more other regions across a logical link.
- It allows a maximum of two sessions between any two regions. Each region uses one session as the transmit part of the link and the other as the receive part.
- You can set up simple link definitions, which are stored in the VFS data set, or you can pass all necessary parameters on link start.

Multipath INMC Links

INMC provides extended facilities for complex networks where multiple physical network paths are available between regions. These are known as multipath links.

A multipath link allows a link between two regions to comprise up to sixteen communication sessions (that is, each region opens up to eight sessions with the other region). Traffic is multiplexed across these sessions either equally or with some sessions having preference over others.

With multipath links you set up link definitions, which are stored in the VFS data set.

Note: If you start an INMC link that has no definition, a simple link is started.

Multipath links can provide the following significant advantages over standard INMC capabilities:

- Multiple sessions traverse different network paths.
- Multiple access methods can be used to provide a backup if there are network connectivity problems.
- High-volume INMC traffic (for example, file transmission operations) can be routed across specific network paths.
- The multipath link can use the combined bandwidth of all network paths to achieve high data transfer rates.
- Multipath links can often eliminate the need to provide additional network bandwidth between computer sites, by multiplexing heavy FTS traffic across existing network paths.
- Multipath links provide improved reliability, because the link remains active as long as one connection exists.

Access Methods

Regardless of the link type, INMC links support VTAM, TCP/IP, XNF, or EPS access methods.

Note: The VTAM application definition that you use for general communications (that is, the APPL identified by the PRI JCL parameter) should include the PARSESS=YES operand. This parameter is required to support the parallel sessions that make up any INMC links that use VTAM.

Security

INMC provides a security exit, allowing verification of the identity of the remote region.

Note: For more information, see the *Security Guide*.

Traffic Flow

INMC is used by the following system components to transmit and receive data traffic flow:

- Remote Operator Facility (ROF)
- Inter-System Routing (ISR)
- CA SOLVE:FTS

Traffic Flow on Simple Links

Data traffic flows between two domains across the twin-session link between the two regions.

Traffic is directed according to preference, across the session in which the transmitting region is the primary end. Therefore, the link can be regarded as having a transmit part and a receive part for each region. The two sessions operate independently.

If there is only one active session, then the traffic flows across the session in both directions.

Traffic Flow on Multipath Links

You can control the way that traffic is prioritized and the routes that the traffic takes by defining specific types of multipath links (see page 211).

INMC prioritizes the traffic so that ROF messages are scheduled with the highest priority and CA SOLVE:FTS the lowest. The multipath link definitions can be defined to control ROF and ISR traffic; however, CA SOLVE:FTS traffic is controlled as part of the CA SOLVE:FTS initiator definition.

INMC Links

There are two types of INMC links:

- Static INMC links
- Dynamic INMC links

Static INMC Links

Static INMC links are most useful between regions that regularly communicate with each other and that always use the same region names.

The link between two regions cannot be established unless each region has been defined to the other and is prepared to accept the connection.

Dynamic INMC Links

Dynamic INMC links provide a mechanism for establishing transient INMC connections between regions to satisfy temporary connection requirements, without specifying permanent definitions for particular regions.

Dynamic links are established between pairs of regions. They occur when *both* of the following occur:

- One region actively attempts to establish communications.
- The targeted region is prepared to accept the incoming INMC request on a generic naming basis, without having been specifically instructed to communicate with the other region.

Dynamic link capability is controlled by the DEFLINK command. This command defines the parameters necessary for an INMC link request to be accepted from a remote region without issuing any LINK START commands.

The DEFLINK command specifies the following critical parameters:

- A mask value used to decide whether the INMC link request should be accepted
- A prefix value used to generate the link name of the INMC link that will be created if the request for the connection is accepted

How You Establish INMC Links

Use the LINK command to define regions to each other.

You can enter the LINK command from OCS or include it in the RMREADY procedure. The LINK command can specify the following to the domain:

- The access method to use (VTAM, XNF, EPS, or TCPIP).
- The link name by which the remote domain is known by this region and by the operators of this region. This name can be up to 12 characters long and lets you assign meaningful names to the various regions in your network. You can assign a link name with the same value as the system ID in the SYSTEMID parameter group for the remote region.
- The name of the region definition that contains the access method details.
- A message prefix to add to all messages received from the remote region.
- The color and highlighting that is to apply to all messages received in OCS from the remote region.
- The retry interval at which your system attempts to contact the remote region following a link outage.

Example: Establish INMC Links

This example establishes a link with a remote region named CHIC1472 in Chicago. The messages from that region are displayed in red, blinking, and with a prefix of CH14. You issue the following commands:

```
DOMAIN DEFINE CHIC1472 VTAM=YES
LINK START=CHICAGO DOMAIN=CHIC1472 COLOR=RED HLIGHT=BLINK MSGID=CH14
```

Note: If you are establishing a static link, to start communication between the two regions, you must also enter a LINK command definition to this region from the CHIC1472 region.

How You Route Commands

When the link is established, you can route commands to the remote region by using the link name.

Example: Route Commands

This example lists the users of a remote region named CHICAGO using the following command:

```
ROUTE CHICAGO SHOW USERS
```

Communication Recovery

If contact is lost on an INMC link, then the action of the regions depends on whether the link is static or dynamic.

Static Links

If contact is lost on a static link, then both the local and the remote regions attempt to re-establish communication automatically.

Dynamic Links

When a dynamic link is established, it operates in the same way as a static link. However, if contact is lost and the dynamic link is broken, then each region acts differently:

- The region that requested the link perceives it as a static link definition and automatically tries to reconnect.
- The region that accepted the link as a dynamic link takes no action to restore the link. It accepts any future request that meets the requirements of a DEFLINK definition.

How You Control INMC Links

You can use the LINK command to stop and restart links, and to delete entire link definitions from storage. You can enter LINK commands from the OCS panel at any time. You can also include them in the READY procedure to have the region attempt link establishment to other regions automatically.

Start an INMC Link

To start an INMC link, issue the following command:

```
LINK START=linkname
```

linkname

Specifies the name by which the remote region is known.

If no previous LINK START command is issued for this destination, INMC retrieves the link definition from the VFS database and attempts to open an INMC link to the remote region. The number of sessions to open and the manner in which they operate is defined in the link definition.

If no link definition exists on the database, INMC accepts the LINK START command and defines a static INMC link.

If DOMAIN or APPLID, and MSGID operands are included on the command, but a link definition exists on the database, the extra operands are ignored and the VFS definition is used.

Stop an INMC Link

To stop an INMC link, issue the following command:

```
LINK STOP=linkname
```

linkname

Specifies the name by which the remote region is known.

This command terminates all sessions with the remote region identified by the *linkname*, and rejects any attempts by the remote domain to reopen the link. The link remains inactive until a subsequent LINK START command is issued.

How You Specify a Particular Route for INMC Traffic

This method applies only to links that use the VTAM access method.

To allocate an INMC session to a particular virtual route, a COS (Class of Service) definition is specified in the logmode table entry. A COS definition defines a list of virtual routes, in order of preference.

To enable the use of a COS definition, define the following logmode table entry:

```
MODEENT   LOGMODE=tablename, *
          FMPROF=X'12',      *
          TSPROF=X'04',      *
          PRIPROT=X'F0',     *
          SECPROT=X'F0'      *
          RUSIZE=X'8787',    *(or as required)
          COMPROT=X'0000',   *
          COS=cosname
```

This logmode table entry is especially useful when using CA SOLVE:FTS. The entry helps ensure that data transfer does not compete with other traffic.

We recommend that when defining multipath links, you associate each session with a separate logmode table entry, which has a separate COS definition that defines a single virtual route.

Note: For more information about logmode table definitions, see the appropriate VTAM installation guides.

Reset an INMC Link

To reset an INMC link, issue the following command:

```
LINK RESET=linkname
```

linkname

Specifies the name by which the remote region is known.

Note: This command is valid only if the link has already stopped. The command removes the current link definition information from storage. A subsequent LINK START command retrieves the definition again from the VFS database if it exists. A link definition modified through INMC maintenance services can be brought online only if the current active link definition is first reset.

Display INMC Links

To display the current status of an active link to a remote region

1. Enter **/INMC** at the prompt.

   The INMC : Link Status List panel appears. This lists the sessions linked to the remote region.

2. To view more details about a link's status, enter **S** or **B** beside the link name.

   The INMC : Link Status Display panel appears.

   The information displayed on this panel varies slightly depending on the following:

   - Whether the link is defined and has a description
   - Whether the link has ever been active

How You Improve INMC Link Performance

To improve the performance of your INMC link, you can make the following changes:

- Increase the size of the INMC internal transmission buffers.
- Increase the RU size specified in the logmode table definition (VTAM only).
- Route the INMC link through a particular route (VTAM only).

Increase Transmission Buffer Size

If you are using a high-speed link to carry INMC traffic, use the SYSPARMS INMCBFSZ command. The command increases the size of the principal INMC transmission buffers. The default size is 4 KB; the maximum size is 15 KB.

Example: Increase Transmission Buffer Size

This example increases the size of the transmission buffer to 8 KB using the following command:

```
SYSPARMS INMCBFSZ=8
```

RU Size in Mode Table Definitions

Note: This method applies only to links that use the VTAM access method.

The RU size specified on the BIND parameters when INMC sessions are established should match or exceed the size specified by the SYSPARMS INMCBFSZ operand.

If you use SYSPARMS INMCBFSZ to increase the INMC internal buffer size, specify an RU size of at least the size of the INMC buffers for the sessions that are established. Otherwise, you do not gain any benefit from the increase. If you specify RU sizes greater than the INMC internal buffer size, then the excess is not used.

The RUSIZES parameter of the logmode table entry specifies the RU size.

The minimum RU size permitted for INMC sessions is 256 bytes. The recommended RU size is 1 KB. If no RU sizes are specified or if a value less than the minimum size is set, INMC uses a default value of 256 bytes.

INMC Link Security

INMC provides a security exit that allows you to implement security to determine whether a link between two regions is established.

INMC provides an assembler exit point to pass control to an installation-coded routine. This routine communicates with an equivalent routine at the remote region and exchanges any required identification information.

Note: For information about the parameter lists and coding requirements for the INMC security exit, see the *Security Guide*.

Problem Diagnosis with INMC Connections

If problems occur when establishing INMC sessions between regions, then a tracing facility is provided to help you determine problems. This facility is provided by setting the SYSPARMS LNKTRACE and SESSMSG operands.

How You Troubleshoot INMC Links

For any given pair of regions with defined links, establishing a connection is automatic once there is a path to each region through the network.

If a link cannot be activated, check the following:

- Has each region been defined to the other? If not, see your systems administrator.
- Does a SHOW LINK display in either region have a link status of PEND-ACT? If so, check that both regions are active, and check the status of the appropriate VTAM cross-region resource managers and resources.
- Does a SHOW LINK display in one region indicate a link status of ACTIVE, but show as STOPPED or PEND-ACT in the other region? If so, this condition indicates a system error. See your systems administrator. Stop, reset, and redefine the link definitions for both regions.
- Does a SHOW LINK display give the status in one region as PEND-ACT, and as STOPPED in the other region? If so, issue a LINK START=*linkname* for the INACTIVE definition.
- If both regions indicate PEND-ACT for the link while there appears to be a network path open between the regions, see your systems administrator.
- Does a SHOW LINK command in either region have a link status of FAILED? If so, check backwards through the activity log for error messages recorded at the time of the failure. Refer these messages to your systems administrator. The link can be restarted using a LINK START command.

INMC Link Planning

A link between two regions can comprise one or more communication sessions, termed a session group. Each region can establish and operate up to eight sessions with the remote region. The remote region acts as the secondary end of each session.

The simplest link consists of two sessions between two regions, one in each direction. However, the link still functions successfully when only one session is open between the two regions.

The following categories of link can be established between regions:

- Simple-mode links
- Rotate and backup multipath links
- Preferential multipath links

Two regions that are to communicate across an INMC link do not need to have the same category of link in both directions. The traffic flow from each region is controlled according to the link definition.

The choice of category depends upon both your network topography and the network traffic requirements. The following sections describe each type of link in detail so that you can choose the type of links most appropriate for your installation.

Simple-mode Links

A simple-mode link allows each region to maintain a single session with the other domain. All traffic across the link flows along the same physical network path. If the network path fails, the link is broken. This type of link is best suited to network configurations that provide a single path between two regions.

You can define a simple-mode link as follows:

- With default session parameters
- With specific session parameters

Simple-mode Link with Default Session Parameters

You can create a simple-mode link definition by specifying the minimum amount of information, which is:

- The region name of the remote region
- The one- to four-character MSGID used as a prefix on ROF messages received from the remote region

All other session parameters are allowed to default as dictated by the access method when sessions are established.

This way of defining regions to each other is appropriate in the following environments:

- There is a single physical network route providing the communication path between the two regions.
- There is no FTS traffic between the two CPUs.
- There is FTS traffic between the two regions, but its effect on other traffic sharing the network path between the two is of no concern or has been minimized.
- The level of VTAM in use does not support multiple network paths between subareas.

Simple-mode Link with Specific Session Parameters

A simple-mode link with specific session parameters has an associated COS definition for each session so that each session has a particular route or transmission priority.

Note: This applies only to sessions using the VTAM access method.

The COS definition is specified in a logmode table entry for the link definition.

Note: The logmode table entries associated with sessions are always governed by the definition of the remote domain's VTAM APPL.

This method of defining an INMC link is appropriate in the following environments:

- There is only one physical network route connecting two regions and traffic is to be allocated a particular transmission priority.
- For operational reasons INMC traffic is to be restricted to a particular network route that can be enforced through the appropriate COS definition.

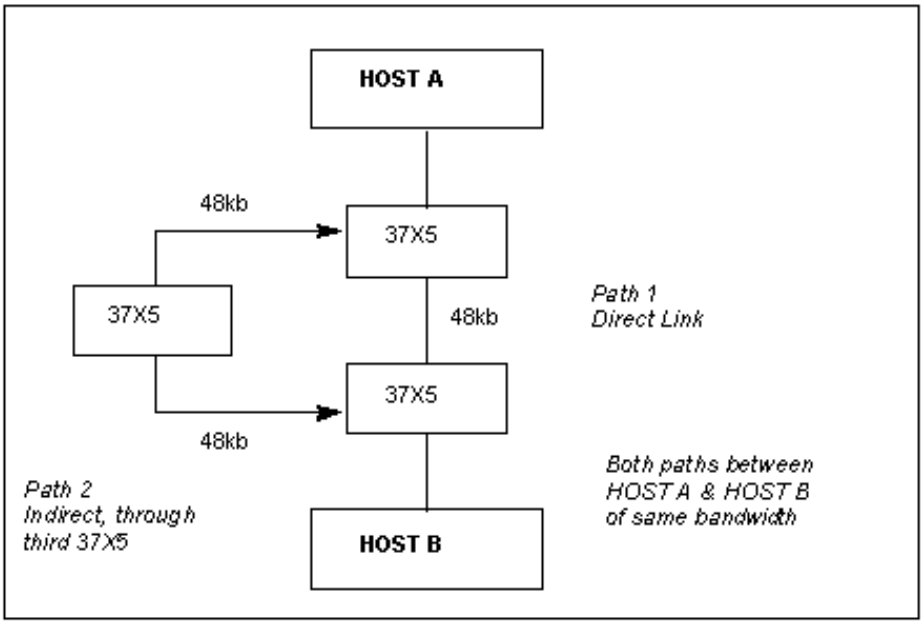
Rotate and Backup Mode Multipath Links

Rotate and backup mode links provide multiple paths through a network connecting two regions. This type of link can establish from two to eight sessions with the remote region. Each session is classified as active or backup (at least one session has to be defined as active). Individual sessions are allocated to different network routes through the use of the appropriate COS definitions.

Traffic between the two regions is sent across all the active links in rotation, and distributed equally across all the active sessions in the session group. If one of the active sessions is lost, then the first available backup session takes its place. When the active session is restored, the backup session is placed back in reserve.

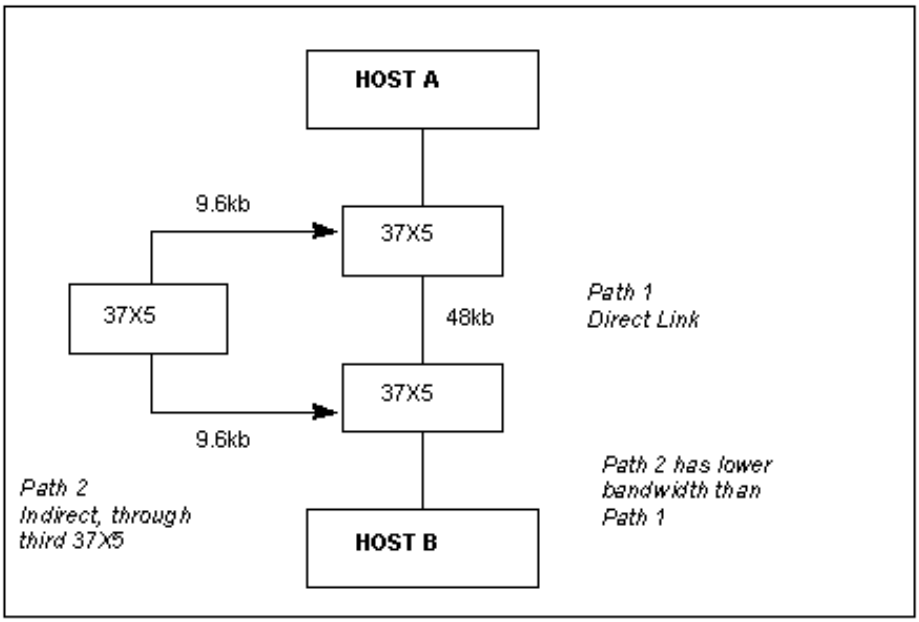
Example: Similar Bandwidth Paths

Rotate and backup links are appropriate in a network where there are two or more active physical network paths of similar bandwidth between two regions. A link is required that uses the aggregate bandwidth of all those physical paths, as shown in the following illustration.



Example: Different Bandwidth Paths

Rotate and backup links are appropriate in a network where there are two active physical paths of different bandwidth between the two regions. A link is required that uses the high-speed path exclusively but switches automatically to the slower path if the fast path fails. The following illustration shows such a configuration.



Rotate and backup links are not suitable for environments where the active sessions traverse different routes with widely differing transmission speeds. Take this into consideration when planning the COS definitions to be associated with the various sessions that form the INMC link.

We recommend that you configure each session to travel only on one virtual route. This configuration ensures that if a session is active its network path is always the same.

Preferential Mode Multipath Links

A preferential link definition defines from two to eight sessions for a remote region, where each session is allocated a traffic weighting. Data is sent, by preference, on the first session. If the first session is busy, then data is sent on the second session unless that is busy too, and so on.

You can select the traffic level at which a session becomes busy and causes an overflow to the next session. You can also specify the number of unresponded chains of data that can be outstanding on a given session at any one time.

A preferential link is best suited to the following circumstances:

- You want to direct as much traffic as possible across a particular network path to reduce its impact on traffic flowing on other network paths. Overflow onto a second network path is allowed only if the volume of traffic exceeds a certain threshold.
- Traffic can be directed to lightly loaded network routes such as those used as backup links.
- Additional bandwidth can be borrowed from time to time from other network paths if the preferred path becomes congested.

Traffic Synchronization on Rotate and Backup and Preferential Multipath Links

When traffic is distributed across the various sessions that make up a rotate and backup or a preferential link, it is resequenced to ensure that it is presented to the remote regions in the same order as it left the transmitting region. This occurs regardless of network route bandwidths which could lead to faster transmission across one session than another.

Failure of one session in a multi-session link does not disrupt the logical link. Traffic traversing the session at the time of failure is resequenced as required and retransmitted across one of the surviving sessions.

Link Definitions

Before you can establish multipath links, specify a link definition in each region that is going to communicate with another.

Note: You can also define simple-mode links. These definitions let you specify session parameters such as the logmode table entry name.

These link definitions are defined by using the INMC link definition facility. You can define the following types of link:

- Simple-mode link
- Rotate and backup
- Preferential

The link name is the symbolic name by which the remote region is identified. Choose a link name that is meaningful so that specific regions are readily identifiable by their link name. We also recommended that each region is known to all other regions by the same link name.

The link definitions are saved on the VFS database for retrieval when a link to a remote region is being activated.

Only authorized users can define INMC link definitions.

Display INMC Link Definitions

To display a list of INMC link definitions, enter **/INMCDEF** at the prompt.

The INMC : Link Definition List panel appears, showing an alphabetic listing of all INMC link definitions on the VFS database.

Note: For more information, press F1 (Help).

Create an INMC Link Definition

The procedure for creating an INMC link definition varies, depending on the type of link:

- Simple-mode link
- Rotate and backup
- Preferential

To create a simple-mode link definition

1. From the INMC : Link Definition List, press F4 (Add).

   The INMC : Link Definition Details panel appears.

2. Complete the following fields:

   Destination Link Name

   Specifies the link name that you want to add.

   Limits: 1 to 12 characters

   Transmission Mode

   Specifies the mode of transmission. Enter **S** (Simple).

   Press F3 (File).

   The definition is saved on the VFS database. The INMC : Link Definition List panel appears, with a message confirming successful addition of the definition.

To create a rotate and backup INMC link definition

1. From the INMC : Link Definition List, press F4 (Add).

   The INMC : Link Definition Details panel appears.

2. Complete the following fields:

   Destination Link Name

   Specifies the link name that you want to add.

   Limits: 1 to 12 characters

   Transmission Mode

   Specifies the mode of transmission. Enter R (Rotate).

   Press F5 (Sessions).

   The INMC : Rotate and Backup Session Details panel appears.

   This panel lets you specify the following details:

   - Number of sessions to open
   - Logmode table entries associated with each of those sessions
   - Information about the session

   Note: For more information, press F1 (Help).

3. Complete the fields for each session required and press F3 (File).

   Note: Define at least two sessions.

   The definition is saved on the VFS database. The INMC : Link Definition List panel appears, accompanied by a message confirming successful addition of the definition.

Create a Preferential INMC Link Definition

To create a preferential INMC link definition

1. From the INMC : Link Definition List, press F4 (Add).

   The INMC : Link Definition Details panel appears.

2. Complete the following fields:

   Destination Link Name

   Specifies the link name that you want to add.

   Limits: 1 to 12 characters

   Transmission Mode

   Specifies the mode of transmission. Enter P(Preferential).

   Press F5 (Sessions).

   The INMC : Preferential Session Details panel appears.

   You can specify the following details:

   - Number of sessions to open
   - Logmode table entries associated with each of those sessions
   - Traffic thresholds where traffic is distributed onto successive sessions.

   Note: For more information, press F1 (Help).

3. Complete the fields for each session required, and press F3 (File).

   Note: Define at least two sessions.

   The definition is saved on the VFS database. The INMC : Link Definition List panel appears, accompanied by a message confirming successful addition of the definition.

Modify an INMC Link Definition

After an INMC link definition is created, it can be updated at any time.

To modify any of the values specified in a link definition

1. From the INMC : Link Definition List, enter **U** beside the name of the link that you want to update.

   The same panels that were used to add a new definition appear with the values that were originally entered.

2. Enter the required values on the panels and press F3 (File).

   The INMC : Link Definition List panel appears, accompanied by a message confirming successful update of the definition.

Delete an INMC Link Definition

To delete a link definition

1. From the INMC : Link Definition List panel, enter **D** beside the name of the link that you want to delete.
2. Press Enter again to confirm the deletion.

   The link definition is deleted.

Centralized Control of Connected Regions

The following features provide services for centralized control of regions connected using INMC:

Remote Operator Facility (ROF)

Provides centralized control at the *user* level.

Inter-System Routing (ISR)

Provides centralized control at the *system* level.

You can use the Remote Operator Facility (ROF) for centralized control of regions connected using INMC.

ROF

ROF lets you monitor and control remote regions from the local region through OCS. ROF uses INMC as its transport facility. ROF services are available only between two regions when there is an active INMC link between them.

How You Define User IDs for ROF

When defining a user ID so that it can be used to operate ROF sessions, consider the following questions:

- What authority level does the user require to issue the commands to control remote regions?
- What NPF message and resource partitioning is to apply to the user?
- What types of messages are required for them to receive, and how are these messages delivered?
- Is the user ID defined on all the remote regions to which it can log on?
- Do the regions have a separate or shared UAMS data set?

Display ROF Users

To identify which users are operating ROF sessions, either to or from remote regions, use the **SHOW USERS** command.

Simplified Command Definitions

The EQUATE command is used to simplify long and complicated commands that ROF operators have to issue frequently. You can use the EQUATES parameter group (enter **/PARMS**) to make EQUATE commands available as systemwide defaults.

ROF and NCL Procedures

Any NCL procedure started by a ROF operator can be used to issue commands to remote regions. The results of these commands are returned to the OCS window of the ROF operator who started the procedure.

&INTCMD can also be used in an NCL procedure to issue commands to remote regions. The results from these commands are returned to the response queue of the issuing procedure and can be read using &INTREAD.

ROF from Background Environments

Background environments can create ROF sessions with remote regions. When a ROF session is started, a standard ROF signon occurs using the user ID of the background environment. If this user ID is not defined to the remote region, then the signon fails.

Background environments can route commands to a remote region over a ROF session and have the results returned to it for examination.

ROF from the System Console

System consoles can establish ROF sessions with remote regions and issue commands to that domain. If your console user ID has a UAMS definition, then the user ID must be defined in the remote region in the ROF session.

If you are using the default console user ID (.DFLTOP), then ROF sessions are not supported.

Sign on to a Remote Region

To sign on to a remote region, use the **SIGNON** command.

Example

To sign on to the remote region PROD01, enter the following command:

```
SIGNON PROD01
```

The remote region checks to see if you are authorized and then notifies you of the connection.

When the connection is established, you receive any unsolicited messages from that region.

Remote Region Signon over an Inactive Link

You can sign on to a remote region with no active INMC link. When you issue the SIGNON command, you wait in a queue for the INMC link to become active.

Example

To sign on to PROD01 but the INMC link to it is not active, enter the following command:

```
SIGNON PROD01
```

This places your signon in a queue and waits until the INMC link to the remote region becomes active. After the link becomes active, the ROF session is established and the region notifies you.

All ROF sessions and queued signons are canceled when you exit OCS.

Reestablishment of a ROF Session On Link Failure

If an INMC link to a remote region fails, your ROF sessions to that region are terminated. The sessions are queued for reestablishment when the link becomes active again. You are notified when the ROF session is reestablished.

If you exit OCS before the link becomes active, the queued SIGNON is canceled.

Issue Commands on a Remote Region

To issue a command on the remote region, use the ROUTE command.

Example: Route a Command

This example sends a SHOW USERS command to PROD01 using the following command:

```
ROUTE PROD01 SHOW USERS
```

The SHOW USERS command executes in PROD01 as if it had been entered from a local terminal, and the result of the command is returned to your OCS window.

Note: If you route a command to a region that you are not signed on to, a signon to that remote region is automatically initiated.

Command Separators

The ROUTE command allows support for a single embedded colon (:) character as a command separator. When the ROUTE command processor encounters a single colon in the command string, it substitutes a semicolon. If the processor encounters two colons, it eliminates the first and sends the second to the target region as part of the transmitted command.

Simplification of Remote Command Execution

Sending commands to remote regions for execution can be simplified by using EQUATE command strings.

Note: For more information about the EQUATE command, see the online help.

Route Commands Through a Remote Region

You can issue a command on another remote region through your current ROF session. This ability lets you establish ROF sessions to remote regions through any number of intermediate regions.

Example: Route a Command Through Another Region

This example sends a SHOW USERS command to PROD02 through PROD01 using the following command:

```
ROUTE PROD01 ROUTE PROD02 SHOW USERS
```

This command sends the SHOW USERS command to PROD02 through an intermediate ROF session with PROD01. This method provides an alternative to a direct ROF session, and can be useful if direct contact cannot be established with the target region.

Received ROF Messages

Whenever you receive messages from remote regions, each message is color coded and prefixed with a message ID.

Color Coding

The messages from remote regions can have different colors depending on which remote region they originate from. If you are connected to multiple remote regions, color coding helps you to identify the source of a message.

The SIGNON command lets you override the default color/highlight attributes which were specified when the INMC link to the remote region was established.

Example: Specify the Color of the Messages from a Region

This example specifies the color red for any messages received from PROD01 using the following command:

```
SIGNON PROD01 COLOR=RED
```

Message IDs

By default, ROF messages returned from a remote region across an ROF session are prefixed with a one- to four-character value. This value is the identifier of the remote region specified when the INMC link was established.

The SIGNON command lets you override the ROF message ID prefix default. This prefix can be any one- to eight-character string.

Such prefixes are private to you. The prefix can be varied for each of your OCS windows or be different for each SIGNON command issued by NCL processes in your NCL processing region.

Example: Change the Message ID Prefix

This example specifies the message ID for any messages received from PROD01 as TEST using the following command when you sign on:

```
SIGNON PROD01 ID=TEST
```

Your prefix, and not the default PROD01, appears as the first word of each ROF message from the remote region.

Sign Off a Remote Region

To sign off a remote region, use the SIGNOFF command.

This command is used for explicit signoff; however, if you exit OCS, all ROF sessions terminate automatically.

Example: Sign Off a Region

This example signs off PROD01 using the following command:

```
SIGNOFF PROD01
```

ISR

Inter-System Routing (ISR) is used to send data from one region to other regions over an INMC link. This feature provides the following functionality:

- Centralized control—receive all system console messages, unsolicited messages, network messages, and all associated network status and error information in a central location.
- Distributed processing—send specific information to certain regions.

The following system environments can use ISR to forward the data they receive to other regions:

AOMPROC

Receives system console messages and related information.

PPOPROC

Receives unsolicited VTAM messages.

CNMPROC

Receives CNM data from VTAM.

To ISR, each of these environments is a conversation class. When they use ISR to send data, they establish a conversation with the environment of the same class in the remote region.

ISR Planning

Before you activate ISR connections throughout the network, establish a plan for processing data in the ISR capable environments. Consider the following factors:

- The rate at which messages are received in remote regions
- In which regions you require ISR to run
- The types of messages you want to receive (For example, you want to filter out messages of a certain severity.)

Message Loop Protection

When data exchange takes place using ISR, the following rules apply:

- ISR does not return data to the region from which it was sourced.
- ISR does not return data to the region from which it last came.

This protection is applied to avoid the possibility of one or more messages being continually sent from region to region in a message loop.

However, in some configurations, a message, sourced from outside a group of connected regions, could bypass the rules and enter a message loop. Always be aware of this possibility when planning your ISR connections. Some conversations provide additional protection against such an occurrence.

Status of ISR

You can use the SHOW ISR command to display the status of all ISR conversations. This command provides information about the conversation classes that are requested to be enabled, and the type of data being exchanged.

The following types of status are displayed:

Local status

Displays information about the ISR conversations from the perspective of the local region.

Remote status

Displays information about ISR conversations from the perspective of the remote region.

Actual status

Displays the status of the ISR conversations from the combined perspective of both the local and the remote region

Example: SHOW ISR

This example shows a SHOW ISR command output:

```
(11.42)---------- NetMaster Operator Console Services (PROD)-----------------
  show isr
  N73610 LINKNAME     DMN      STATUS   SSCP     NETID    L-C R-C A-C   QMAX
  N73611               CLASS    -LOCAL  STATUS- -REMOTE STATUS- -ACTUAL STATUS-
  N73612                        E/D SOL IN  OUT E/D SOL IN  OUT E/D SOL IN  OUT
  N73615 *DEFAULT*    -        -        -        -        *   -   -     320K
  N73617               PPO      DIS YES NO  NO  -   -   -   -   -   -   -   -
  N73617               NTS      DIS YES NO  NO  -   -   -   -   -   -   -   -
  N73617               NEWS     DIS YES NO  NO  -   -   -   -   -   -   -   -
  N73617               AOM      DIS YES NO  NO  -   -   -   -   -   -   -   -
  N73615 PROD3        ST3N     ACTIVE   SDD1VTM1 FTI      NO  YES NO    320K
  N73617               PPO      DIS YES NO  NO  ENA YES NO  YES DIS YES NO  NO
  N73617               NTS      ENA YES YES NO  ENA YES NO  YES ENA YES YES NO
  N73617               NEWS     ENA YES YES NO  ENA YES NO  YES ENA YES YES NO
  N73617               AOM      DIS YES NO  NO  ENA YES NO  NO  DIS YES NO  NO
  N13503 *END*
_______________________________________________________________________________




 ==> show isr
```

Control of the Type of Data Received Through ISR

For AOM, PPO, and Network Error Warning System (NEWS) (a component of CA NetMaster NM for SNA), you can control data exchange though the use of AOMPROC, PPOPROC, and CNMPROC respectively. For NTS, control is through the region and class parameter settings that request the type of data that NTS is to collect.

Note: For more information about the interaction of NEWS and NTS with ISR, see the CA NetMaster NM for SNA *Administration Guide*.

However, in the case of AOM, PPO, and CA NetMaster NM for SNA, there are important parallels that provide a general understanding of ISR operation in these environments.

The following functionality is common to AOMPROC, PPOPROC, and CNMPROC:

- Each of the environments in which each of the procedures resides has an ISR capability. This capability exists irrespective of whether an actual procedure is running in the environment at any time.
- The ISR command controls the data exchange between the environments. Internal or programmatic control is possible in a procedure by operands on the &*xxx*CONT and &*xxx*DEL NCL statements.

  Note: For the purposes of this topic, *xxx* refers to PPO, AOM, and CNM.
- All the environments have an &*xxx*READ, &*xxx*CONT, &*xxx*DEL, or &*xxx*REPL that can be used to assist with the reading and distribution of the data they receive.

  A procedure reads the data it receives, processes the input, then repeats the process. If no &*xxx*CONT, &*xxx*DEL or &*xxx*REPL statements are issued during processing then by definition an implied &*xxx*CONT is performed.

  Note: For more information about &*xxx*READ, &*xxx*CONT, &*xxx*DEL, and &*xxx*REPL, see the *Network Control Language Reference Guide.*
- Delivery of data to other regions through ISR can be handled as follows:

  Implicit delivery

  No specific destination information is specified for the data.

  For example, if there are no ISR connections enabled, no ISR delivery takes place. However, if there are links enabled for outbound messages, then a copy of the data is sent over every link. Where &*xxx*CONT is used, the NCL return code and feedback information indicate the result of the request.

  Explicit delivery

  Specific destination operands are specified on the &*xxx*CONT and &*xxx*DEL statements. These operands are LINK, DOMAIN, and SSCPNAME.

  Note: Only one of these operands can be specified at any one time. Not all components support the use of all these operands. For example, if you want to send the data from AOMPROC to only one of your two remote regions, identify this region on the &AOMCONT statement.

ISR Data Flow Without a Procedure

If a procedure terminates, or no procedure is started, your system can continue to receive messages sent to the particular environment.

When input arrives for an environment in which no AOMPROC, CNMPROC, or PPOPROC is executing, it is distributed as though an implicit &*xxx*CONT was issued. Therefore, all messages can be sent to a destination domain for processing by running without a procedure in the source region.

APPC Links

APPC lets you establish links between regions and between a region and other applications. If you have NCL applications that use APPC, you create APPC links.

Start APPC Links

Use the LINK command to start an APPC link.

To start an APPC link, enter the following command:

```
LINK TYPE=APPC START=link_name
```

link_name

Specifies the link name of the region or application you are connecting with.

Sometimes, you supply a password before an APPC session is established. This requirement is set up in the APPC link definition by your system administrator.

Example: Start an APPC Link

This example establishes an APPC link with NMA from SOLVE01 using the following command:

```
LINK TYPE=APPC START=NMA
```

Start an APPC over INMC Link

You can start an APPC link that uses INMC as its access method (transport provider).

To start this APPC link, enter, for example, the following command:

```
LINK TYPE=APPC START=NMA AM=INMC
```

The link is not established until the INMC link to NMA is active.

Note: Because INMC links can use TCP/IP, starting an APPC over INMC link means that you can establish an APPC link between regions with no physical VTAM network connection.

Display APPC Link Status

You can display the following information about APPC links:

- Link name
- Remote LU name
- Link status
- Link type (parallel or single session)
- LU6.2 options supported (for example, mapping)
- Link and conversation level security supported
- Session limit for the link

To list and display information about APPC links, enter the following command:

```
SHOW LINK TYPE=APPC
```

Stop APPC Links

Use the LINK STOP command to stop an APPC link.

To stop an APPC link, enter the following command:

```
LINK TYPE=APPC STOP=link_name
```

Example: Stop an APPC Link

This example stops the APPC link between SOLVE01 and NMA using the following command:

```
LINK TYPE=APPC STOP=NMA
```

Chapter 19: Broadcasts

This section contains the following topics:

Broadcast Services

Broadcast Services let you utilize the various broadcasting capabilities of your system services. Broadcast messages can be sent to terminals, users, and applications, and can be stored on a file.

Broadcast Services let you send the following types of broadcast:

- A general broadcast of one to four lines
- A primary menu broadcast of one line
- A broadcast of up to four lines to all, or specific, EASINET terminals
- A broadcast of up to four lines to all, or specific, system services attached terminals (including EASINET terminals)
- A broadcast of up to four hundred lines to all, or specific, users
- A broadcast of up to four hundred lines to a selected list of users.
- A broadcast of up to four lines to MAI users of an application (for example CICS or IMS).
- A broadcast of up to four lines to users of an NCL application.
- A broadcast to a specific user ID according to their preferred method of notification (as indicated in their UAMS security profile).

Note: Broadcast capabilities are also provided by the $BSCALL NCL interface. For more information, see the *Network Control Language Reference Guide*.

Types of Broadcasts

The broadcasts listed above can be grouped into the following types:

- General
- Primary Menu
- User

These broadcasts are either static or dynamic.

List Broadcasts

To display a list of all active broadcasts in the system

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **L** at the prompt.

   The List Broadcasts panel appears.

   Note: The broadcasts in the selection list are either permanent or still to be viewed. A permanent broadcast is displayed until deleted by a user. Other broadcasts are displayed until they have been viewed by all target recipients.

View Active Broadcasts

To view the contents of an outstanding broadcast, enter **S** (Browse) next to the required broadcast in the selection list.

The details appear.

Delete Active Broadcasts

To delete an active broadcast, enter **D** (Delete) next to the required broadcast in the selection list.

The broadcast is deleted.

Note: If you want to delete a broadcast before all target recipients have received the broadcast, enter **FD** (Force Delete) next to the required broadcast.

Broadcast to Generic Resources

This section describes how to use the Broadcast Services facilities to enable broadcasts to regions belonging to a VTAM generic resource.

These facilities are available from the Broadcast Services : Primary Menu (**/BCAST**).

Enable Broadcasts to Generic Resources

To enable user and terminal broadcasts to regions belonging to a VTAM generic resource group, there must be a broadcast system group corresponding to that generic resource.

To add a broadcast system group corresponding to a generic resource

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **LS** at the prompt.

   The Broadcast Services : Group List panel appears.

3. Press F4 (Add).

   The Broadcast Services : Group Definition panel appears.

4. Complete the following fields:

   Group Name

   Specifies the name of the new broadcast group.

   Description

   Describes the new broadcast group.

   Include Local System?

   Specifies whether the local system is included in the broadcast group. YES indicates that broadcasts can be issued on this system. NO indicates that broadcasts can be issued on remote systems only.

   Press F4 (Save)

   The group definition is saved. A message is returned, confirming that the new broadcast group has been added.

Add Resources to a Broadcast System Group

To add resources to a Broadcast System Group

1. From the Broadcast Services : Group Definition panel, press F5 (Resources).

   The Broadcast Services : Resource List panel appears.

2. Press F4 (Add).

   The Broadcast Services : Resource Definition panel appears.

3. Complete the following fields:

   Resource Type

   Specifies the type of resource to add. The following types of resource are supported:

   APPCLINK

   A predefined name of an APPC link between two regions.

   Limits: 12 characters

   DOMAIN

   A region (with a name of up to four characters) attached by INMC.

   Limits: 4 characters

   LU

   A network resource name that identifies the required region.

   Limits: 8 characters

   Note: When adding DOMAIN or LU resources, ensure that the necessary DEFLINK commands have been issued to allow the region to connect by using APPC.

   Resource Name

   Specifies the name of the resource to add. This name is used on the Broadcast Services : Send Menu when sending a broadcast to the system group.

   Press F3 (File).

   The changes are saved. The Broadcast Services : Resource List panel appears, with the new resource added.

4. Repeat steps 1 through 3 for each resource that you want to add to the broadcast group.

Send Broadcasts to Generic Resources

When you have defined a broadcast system group for your generic resource, you can use that system group to send broadcasts to regions belonging to the generic resource.

To send broadcasts to generic resources

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **S** at the prompt.

   The Broadcast Services : Send Menu appears.

3. Complete the following field:

   System Group

   Specifies the system group name for your generic resource.

   Enter the mnemonic of the type of broadcast that you want to send at the prompt.

   The broadcast is sent.

Set General Broadcasts

A general broadcast allows you to notify potential users of the system about critical events. For example, the impending unavailability of a major application such as production CICS or IMS subsystems.

A general broadcast can be up to four lines, and can be sent to all EASINET terminals or all system services terminals, including EASINET terminals. The lines of broadcast appear at the bottom of the terminal display and are available across system restarts.

When you send a general broadcast, the NCL variables &BROLINE1 to 4 are updated. Any panel containing these variables displays the text you have entered the next time a user accesses those panels.

To set a general broadcast

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **G** at the prompt on the Broadcast Services : Primary Menu.

   The Broadcast Services : Edit Broadcast Text panel appears.

   On entry to this panel, the lines in the editor display the text from the last general broadcast that was issued. Details of the user who issued the last broadcast are also displayed.

3. Enter the text that you want to send as a general broadcast in the text lines provided and press F3 (File).

   The broadcast is saved.

Note: This procedure sets the broadcast so that it can be displayed and saves the broadcast in the system services VFS file so it is available across system restarts.

Set Primary Menu Broadcasts

The primary menu broadcast allows you to set one line of text to display on the primary menu. This type of broadcast is useful for reminding users of something about the system they have logged on to. For example, you may want to remind users that the system is a test system and that they should not change anything.

To set a primary menu broadcast

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **P** at the prompt.

   The Broadcast Services : Edit Broadcast Text panel appears. This looks similar to the edit panel for a general broadcast except there is only one text line available for input.

   When you first access this panel, details are given of when the text was last updated, and by which user ID.

3. Enter the text you want displayed on the primary menu in the text line, and press F3 (File).

   The broadcast is saved.

   Note: When you enter text in this line, the NCL variable &ZPMTEXT1, which is contained on the primary menu, is updated. When you press F3, the primary menu is updated and the broadcast is displayed when a user next accesses that menu. F3 also saves the broadcast so that it is displayed across system restarts.

Review Active Broadcasts

To review active dynamic broadcasts that are applicable to your terminal and user ID

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **R** at the prompt.

   The Broadcast Services : Review Broadcasts panel appears. This panel displays all the broadcasts for your user ID and terminal in the same way you receive a broadcast when you log in. To view subsequent broadcasts, press F8 (Forward).

   The dashed line above each broadcast includes a message that indicates whether the broadcast is deleted or whether it is retained by the review function. Retained broadcasts can be deleted from the List Broadcasts panel only.

Send Dynamic Broadcasts

A dynamic broadcast allows you to send a message to a specific user, or to a range of users. When a broadcast is sent, a panel is displayed containing the broadcast lines and details of the broadcast initiation.

After a broadcast is sent, it is retained until you exit broadcast services. If you want to send another broadcast, the previous broadcast is displayed on the editor if you have not left broadcast services. This feature allows you to send the same broadcast again, or edit it to send to another user, or group of users.

To send a dynamic broadcast

1. Enter **/BCAST** at the prompt.

   The Broadcast Services : Primary Menu appears.

2. Enter **S** at the prompt.

   The Broadcast Services : Send Menu appears.

   Note: For information about the fields and options available on the prompt on the Broadcast Services : Send Menu, press F1 (Help).

3. Complete the appropriate fields for the type of broadcast you want to send, and select the option.

   Note: If you specified option U and prompting in the Destination Mask field, you are presented with a list of user IDs. Select the users you want to send the broadcast to and then press Enter.

   The Broadcast Services : Edit Broadcast Text panel appears.

   Note: If you select option U, you can specify a maximum of 400 lines of broadcast text. If you select any of the other options, you can specify a maximum of four lines of broadcast text.

4. Type the broadcast text, and press F3 (File).

   The broadcast is initiated. An acknowledgment message is displayed when processing is complete. This message shows the total number of terminals and users that have received the broadcast.

   Note: If you send a broadcast to a user who is logged on more than once, the acknowledgment message includes each of their logons in the total number of user IDs that have received the broadcast. However, when the user has viewed the broadcast, the broadcast is discarded for their duplicate logons.

Received Broadcasts

When a received broadcast has more lines than the screen has available, you can use the F8 (Forward) and F7 (Backward) keys to scroll through the broadcast.

To acknowledge receipt of the broadcast, press F3 (Exit). However, when you press F3 (Exit), you no longer have access to the broadcast. If the broadcast is more than one screen, you can press F3 (Exit) before you have read the whole broadcast.

Access System Group Definition

Broadcast services can be customized to send messages to one or more remote regions. This customization is performed by setting up system group definitions.

Each system group definition contains one or more remote regions to which a broadcast is sent. By specifying a system group definition when sending a broadcast, that broadcast is sent to the remote regions defined in that group definition. The local region can also be included in the system group definition.

The List System Groups option of the Broadcast Services primary menu is used to access the list of defined system groups on your system. From this list you can add, update, and copy system group definitions.

To access a list of the system groups defined, enter **/BCAST.LS** at the prompt.

The Broadcast Services : Group List panel appears. If no system groups have been defined, no entries appear in this list.

Note: For information about the information displayed and the actions available on the Broadcast Services : Group List panel, press F1 (Help).

Appendix A: Connecting Terminals

This section contains the following topics:

Supported Terminals

Your product region supports the following IBM devices. Any compatible device is also supported.

- Full function support for 3270 family LU0 and LU2 (up to 255 x 255) devices
- Full function (including DBCS) support for 5550 (24 x 80) devices
- OCS and printing support for 3767 or other LU1 devices

Information that allows your product to connect to these terminals is contained in their VTAM mode table definition.

Note: Your product region supports full operator functions through the operating system console by use of the MODIFY command. Privilege and authority available through the console can also be controlled. For more information about defining a system console, see the *Security Guide*.

How Your Product Accepts Terminal Connections

When a request for a terminal connection is made to your product, the following process occurs:

1. The logon exit is driven.
2. The logon exit examines the session parameters to determine the terminal type.
3. If the connection is accepted, the session parameters are modified, if necessary, and an OPNDST macro is issued. A BIND request then flows to the terminal. A CLSDST macro is issued if the request is rejected and information about the reason for the failure is sent to the terminal.
4. The terminal receives the BIND and if the parameters contained therein are suitable, logon proceeds and the session is established.

Extended Attributes Support

If you want to specify additional attributes for your terminal connections, you can specify a parameter in the logmode definition that allows your region to send a query to a requesting terminal.

The query obtains the following information from the requesting terminal:

- Extended (seven) color
- Extended highlighting
- Field outlining
- DBCS (double-byte data streams for special language support)
- Screen size

A query is sent when X‘80’ is specified in the second position of the PSERVIC field of the logmode definition, for example, PSERVIC=X‘0280...’.

Screen Sizes

Some terminals and controllers support a special screen size definition in the logmode table definition called *unspecified viewport size*. When unspecified viewport size is specified, the screen size is determined from the parameters received from the terminal in a query.

If unspecified viewport size is not specified, the default or alternate screen size for the terminal type determines the screen size for the terminal connection. The default for all terminal types is 24 rows by 80 columns. The alternate screen size is the largest screen size of which a terminal type is capable.

To enable unspecified viewport size, specify X‘03’ in the 11th position of the PSERVIC field of the logmode table definition.

Notes:

- The session parameters are not altered to specify unspecified viewport size unless the definition also supports a query of extended attributes.
- The screen size for non-SNA terminals is always set using the information obtained by the query, regardless of the screen size information in the BIND.
- If an unspecified viewport size BIND is sent to a terminal that does not support it, the BIND fails.
- The following devices support an unspecified viewport size BIND:
  - 3174 controller
  - 3274 controller at Configuration Support D, Release level 65
  - Most distributed function devices

Logmode Table Definitions

The following table specifies the logmode table parameter values that are expected for different terminal types:

Terminal Type	Expected Parameter Values
LU1	FMPROF=X‘02’
LU2	FMPROF=X‘03’ PSERVIC=X‘01...’
LU3	FMPROF=X‘03’ PSERVIC=X‘02...’

Examples of suggested mode table entries for most 3270 panels can be found in the MODETABS member in the base installation library CC2DSAMP. In most cases, the default VTAM-supplied tables are adequate.

A sample mode table definition for use with LU1 terminals that are to be supported by MAI-OC is also supplied in the member.

Note: For more information about coding mode table entries, see IBM's *Communications Server SNA Resource Definition Reference*.

Appendix B: Product Region JCL Parameters

This section contains the following topics:

Product Region JCL Parameter Summary

The following JCL parameters are available.

AM

Specifies the access method to use for communication between terminals.

ARMNAME

Specifies the name used to register a region with the Automatic Restart Manager (ARM).

DBCS

Specifies the DBCS option.

DSNQLCL

Specifies the local VSAM data set qualifier.

DSNQLNV

Specifies the local non-VSAM data set qualifier.

DSNQSHR

Specifies the shared VSAM data set qualifier.

DSNQSNV

Specifies the shared non-VSAM data set qualifier.

DYNVVOL

Specifies a default volume for dynamically allocating files.

INIFILE

Specifies the INI file to use for customization of parameters.

INIRESET

Indicates that all current parameters are ignored and the defaults used.

INIT

Specifies the name of the NCL procedure in the COMMANDS library that is executed during region initialization before VTAM ACBs are opened.

INIWTO

Indicates that initialization messages are displayed on the system console.

INT

Determines which internal commands can be used.

NCLFM

Specifies the default CMS FILEMODE that applies to loading NCL procedures.

Note: This parameter is only for z/VM.

NMDID

Specifies the domain ID for this system.

NMSUP

Specifies the System User Prefix for background user IDs.

NOMODIFY

Specifies that operating system MODIFY facility communication with the product using the system console is not supported.

NPF

Specifies whether NPF is used on the system.

NPFFM

Specifies that default CMS FILEMODE applies when loading NPF tables.

Note: This parameter is only for z/VM.

OPT

Activates CPU accounting support.

OSINP

Controls access to the OSCNTL data set. Access can be either read-only or update.

PRI

Specifies the name of the primary VTAM ACB APPL to use for terminal communication.

PROD

Specifies the list of features to include in the region.

READY

Specifies the name of the NCL procedure in the COMMANDS library that executes during region initialization after VTAM ACBs have been successfully opened.

SEC

Specifies whether a security exit is used.

SSID

Specifies whether a connection is made to the subsystem interface (SSI) during region initialization.

TZ

Specifies whether the internal time zone is set to Greenwich Mean Time or system local time.

UDBDEFER

Specifies that all UDB open processing is deferred and no attempts to open UDBs are made before the UDBCTL command is used.

VFSENQ

Specifies whether the VFS data set is enqueued exclusively on initialization.

VSAMIO

Specifies when VSAM I/O is performed in the main task, or using a separate subtask.

WTO

Specifies whether the system console is sent monitor class messages.

XOPT

Specifies extended options such as options for dump processing and ARM registration.

Product Region JCL Parameter Descriptions

The following list provides detailed descriptions of the JCL parameters that the started task member of your product region can specify. The default value is underlined.

ARMNAME=*name*

Specifies the name used to register a region with the Automatic Restart Manager (ARM). If not specified, the default is SVM_*acbname* where *acbname* is the ACB name set by the PRI= JCL parameter. Use the XOPT= JCL parameter to set ARM options.

DBCS={ NO | YES | IBM | FUJITSU }

Specifies the DBCS option.

DSNQLCL

Specifies the name of the local VSAM data set qualifier. This value is used when allocating data sets.

DSNQLNV

Specifies the name of the local non-VSAM data set qualifier. This value is used when allocating data sets.

DSNQSHR

Specifies the name of the shared VSAM data set qualifier. This value is used when allocating data sets.

DSNQSNV

Specifies the name of the shared non-VSAM data set qualifier. This value is used when allocating data sets.

DYNVVOL=*value*

Specifies a default volume for dynamically allocating files. If this parameter is not specified, no volume is specified in the dynamic allocations and SMS allocates the files according to its rules.

INIFILE=*filename*

Specifies the INI file to use for customization of parameters.

INIRESET

Specifies that all current parameters are ignored and the defaults used. If an INI file is specified, do not use this parameter.

INIT={ NMINIT | *name* }

Specifies the name of the NCL procedure in the COMMANDS library that is executed during region initialization before VTAM ACBs are opened.

Limits: *name* must have one through eight characters.

INIWTO

Specifies that initialization messages are echoed to the system console.

INT={ 00 | *nn* }

Specifies which internal commands can be used. The parameter value comprises one hexadecimal byte, where each bit indicates acceptance of a particular command, as shown in the following table. The recommended value is INT=E4, that is, all commands shown in the table.

Bit	Command	Function
X'80'	SHOW STOR	Storage display
X'40	##AT, SH ##AT	AT-trap facility
X'20	##DP	Storage alter
X'10	(Reserved)	(Reserved)
X'08	(Reserved)	(Reserved)
X'04	##PMON	Performance monitor
X'02	(Reserved)	(Reserved)
X'01	(Reserved)	(Reserved)

NCLFM={ * | a }

(z/VM) Specifies the CMS filemode that applies to loading NCL procedures. This must be a valid CMS filemode.

NMDID=*domainid*

Defines the domain ID for this system. If the domain ID is not specified, the first characters (up to a maximum of 4) of the system primary ACB name, specified in the PRI parameter (or the default if not specified), are used as the default value.

The domain ID should be unique across all connected systems. If the value is not unique, it can produce naming conflicts, which restrict inter-system functionality, such as ROF sessions from background environments. Do not confuse this parameter with the system ID in the SYSTEMID parameter group.

Limits: One to four characters

NMSUP=*userprefix*

Specifies the System User Prefix that is used to prefix the user IDs for background system environments. If not specified, the domain ID is used. If the domain ID has not been specified, the first characters (up to a maximum of 4) of the system primary ACB name specified in the PRI parameter are used as the default value.

Limits: One to four characters

NOMODIFY

Specifies that communication between the operating system MODIFY facility and the product, using the system console, is not supported. If this operand is omitted, the use of MODIFY is supported.

NPF={ NO | YES }

Controls the use of NPF. Specify NO to inhibit NPF in the region. This is useful on test regions where security checking is not required but where a production UAMS is used.

NPFFM={ * | a }

(z/VM) Specifies the CMS filemode that applies when loading NPF tables. This must be a valid CMS filemode.

OPT={ 00 | *nn* }

Activates CPU accounting support. The parameter value comprises one hexadecimal byte, where each bit indicates the level of accounting, as shown in the following table, which lists the values of the OPT parameter.

Bit	Accounting
X'02'	CPU accounting for all threads
X'01	CPU accounting for NCL threads only

OSINP={ YES | NO }

Controls access to the OSCNTL data set. Access can be either read-only or update. Specifying YES (the default) indicates that the data set is opened for read only access. Specifying NO indicates that it is opened for update. When NO is specified, and an attempt to open the file for update fails, the region retries the open for read only access.

PRI={ NM | *acbname* }

Specifies the name of the primary VTAM ACB for the region to be used for terminal communication.

Limits: One to eight characters

Note: If this parameter is omitted, the default (NM) is also the default for the NMDID and NMSUP parameters, and the system ID in the SYSTEMID parameter group.

PROD={ *product* | (*product1,product2,...productn*) }

Specifies the list of product name key values for the features to include in the region. The PROD list implies that only the specified products are to be included in the region during initialization and that all other products are to be excluded.

Note: The list of included products cannot be modified without a restart of the region. Products not nominated in the PROD list are not resident in the region while it is active.

READY={ NMREADY | *membername* }

Specifies the name of the NCL procedure, in the COMMANDS procedure library, which executes as part of system initialization after VTAM ACBs have been opened successfully.

Limits: One to eight characters

SEC={ * | NO | PARTSAF | NMSAF | *name* }

Specifies whether the region uses a security exit.

If an asterisk (*) is specified, the region uses a security exit if one has been link edited into the NM001 load module. If no security exit has been link edited, then the region uses the NMUEX01 load module if it is in an accessible load library.

If NO is specified, no security exit is used. This specification overrides any link edited exit or the NMUEX01 load module.

If PARTSAF is specified, a vendor-supplied partial security exit that uses SAF is used.

If NMSAF is specified, the vendor-supplied security solution is used.

If name is specified, the named load module is loaded and used as the security exit. If this load module cannot be found, then the region terminates.

Important! If an abend occurs in the exit and the requested function cannot be performed, it is regarded as a security exposure and the region terminates. Message N00303 is sent to the console as a WTO, with RC=8.

Note: For more information about security exits, see the *Security Guide*.

SSID={ NO | * | *name* }

Specifies whether to establish a connection to a SOLVE Subsystem Interface (SSI) during initialization.

If NO is specified, then no connection to a SOLVE SSI is attempted. The connection is started (or attempted) only if the SSI parameter group requests a connection.

If an asterisk (*) is specified, then an SSID of the first four characters of your product region job name is used.

If *name* is specified, then a specific SSID must be entered.

If * or *name* is specified, then an attempt to connect to the SSI is made immediately. If it fails, it retries every *n* seconds, depending on the value in the SSI parameter group.

SSM={ NO | YES }

Specifies whether to enable support for CA OPS/MVS System State Manager (SSM).

Default: NO

SSMAPPL=*application_name*

Specifies the application name registered with CA OPS/MVS for this product or component.

Limits: Eight characters

Important! Each product or component registers a specific application name with CA OPS/MVS. *Do not change this name.*

The application name registered for CA SOLVE:Operations Automation and CA SOLVE:Operations Automation for CICS is SOLVE.

SSMHBI=*heartbeat_interval*

For SSM=YES, specifies how often to send heartbeats to CA OPS/MVS SSM. The heartbeat interval is in minutes. A value of zero indicates no heartbeat.

Initial value: 5

Limits: 0 through 60

TZ={ *shhmmm* | GMT }

Sets the internal time zone for your product region to a specific offset or Greenwich Mean Time (GMT). *The operating system offset is ignored, and no changes will be detected or processed.* Generally, you should not specify this parameter and your region runs on system local time.

The system hardware clock is usually set to GMT. The system local time is set by the operator when the operating system is initialized. The difference between the hardware time and the local time is the time zone offset from GMT.

When the hardware time is not set to GMT, you can use the TZ parameter to set this time. The region uses the system local time as the current time but uses the specified offset when calculating GMT.

s

Is plus (+) or minus (-), depending on whether the site is ahead (+) or behind (-) GMT.

hhmm

Specifies the four-digit hours and minutes value of the time zone offset.

Limits: 15 hours

If GMT is specified, then, assuming that the hardware clock is set to GMT, the internal time is set to GMT, rather than system local time. For example, if the system is four hours ahead of GMT and the local time is 5 pm, GMT time is 1 pm. Your region will use 1 pm as the displayed 'local' time.

UDBDEFER

Specifies that all UDB open processing is to be deferred and no attempts to open UDBs are to be made before the UDBCTL command is used.

NCL automatically attempts to open DD names that start with UDB on the assumption that they are utilized as UDBs. If specific processing options are required for UDBs, such as use of LSR pools, use the UDBCTL command to open the UDB with the required options.

Selecting DD names that do not start with UDB bypasses automatic open processing and requires opening by the UDBCTL command. Typically, UDBCTL commands to open UDBs are placed in the NMINIT or NMREADY procedures.

VFSENQ={ YES | NO }

Specifies whether the VFS data set is enqueued exclusively on initialization. The default is YES. NO blocks the ENQ and allows immediate restart.

When using the ABENDCMD command to restart a started task, z/OS do not hold the new task until the old one finishes dumping. This can cause errors during startup. For example, NCL dynamic allocation requests might fail if DISP=OLD is specified. Also, VSAM data sets might fail to open if SHROPTIONS 1 or 2 are in effect.

VSAMIO={ M | S | D }

Specifies how VSAM I/O is performed in your product region:

- M specifies that all VSAM requests are performed in the main task.
- S specifies that all VSAM requests are performed in the subtask.
- D specifies that your product dynamically switches between main task and subtask, based on load.

If significant VSAM activity is anticipated, specifying S improves processing overlap on multi-CPU machines.

WTO={ YES | NO }

Specifies whether the system console is to be sent monitor class messages if no definition exists for the system console user ID (usually *pppp*OPER).

XM={ TASK | ZIIP | BEST }

Specifies whether to move some processing performed by the main task of the region from the central processor (CP) to a zIIP.

- TASK or T specifies that main task processing occurs on the CP.
- ZIIP or Z specifies that main task processing occurs on a zIIP. If a zIIP is not available, an error message is generated and processing continues on the CP.
- BEST or B specifies that main task processing occurs on a zIIP if it is available; otherwise, processing occurs on the CP.

Default: TASK or T

XOPT={ *option* | (*option, option, ...*) }

Specifies the following options (for example, for dump processing and ARM registration). This parameter can be specified more than once.

NOSXWEBU

(Default) Specifies that user security exit cannot handle web users.

SXWEBU

Specifies that user security exit has been modified to handle web users.

SDUMP

Specifies that write ABEND dumps to the SYS1.DUMP data set.

NOSDUMP

(Default) Specifies that send ABEND dumps to the normal dump data sets.

DAE

Specifies to provide DAE symptom information when writing an ABEND dump.

NODAE

(Default) Specifies that DAE symptoms information is not provided.

ARM

Specifies that the region tries to register with the Automatic Restart Manager (ARM), using an ARM element name specified through the ARMNAME= JCL parameter. If a registered region fails, the sysplex ARM restarts that region automatically.

NOARM

(Default) Specifies that the region does not register with ARM.

RLSU

Requests VSAM Record Level Sharing (RLS) for the UAMS file.

NORLSU

(Default) Specifies that VSAM RLS is not used for the UAMS file.

PVLOAD

(Default) Loads persistent variables when starting a region.

NOPVLOAD

Prevents the loading of persistent variables when starting a region.

PWMIX

Specifies that mixed case passwords are supported.

If you enable this support, consider the following important points:

- Do not share a UAMS database with a region that does not support mixed case passwords and is not using a partial security exit.
- Ensure that all regions in a multisystem environment have this support enabled.

Product Name Keys

The following table shows product names with their associated product name keys and LMP codes for z/OS. The table contains the following information:

Product Names

These reflect products that can be sold. Each product name has a product name key and one or more associated LMP codes (one for each operating system where the product is available).

Subfunctions

Many products include subfunctions, shown indented. These subfunctions are not separately licensed, but the functionality of each required subfunction are included in the PROD= parameter.

The PROD= parameter enables you to select the functionality you require in a region, and to exclude parts that you do not require.

Including Subfunctions

To include a subfunction, you specify in the PROD= parameter the product name keys of both the product name and the subfunction.

Product Name	Product Name Key	LMP Code
CA NetMaster NM for SNA	SNA	YX
CA NetMaster NA	SNAAUTO	XY
NetView Connect	NVC	N/A
CA NetMaster NM for TCP/IP	TCPIP	Y7
ReportCenter	REPORTER	N/A
CA NetMaster SM for CICS	SOCKETMGMT	2D
WebCenter SDK	WEBCENTERSDK	N/A
CA NetMaster FTM	FT	X3
CONNECT:Direct Support	FTCD	N/A
CONNECT:Mailbox Support	FTMBX	N/A
FTP Support	FTFTP	N/A
CA XCOM Support	FTXCOM	N/A
ReportCenter	REPORTER	N/A
CA SOLVE:FTS Support	FTFTS	N/A
WebCenter SDK	WEBCENTERSDK	N/A
CA SOLVE:FTS	FTS	ZI
CA SOLVE:Operations Automation	OPSOS	ZX
Linux Management	LINUXMGMT	N/A
CA SOLVE:Operations Automation for CICS	OPSCICS	Z5

Appendix C: SYSPARMS Operands

This section contains the following topics:

Generic SYSPARMS Summary Table

This following table provides a summary of SYSPARMS operands.

Note: After region initialization, you cannot use the SYSPARMS command to change those operands that parameter groups set.

Some SYSPARMS operands apply to specific products only. These operands are indicated in the table by the following codes:

AS

Any product that uses Automation Services

SN

CA NetMaster NM for SNA

DS

CA SOLVE:FTS

SYSPARM	Description	Product Code
ACBRETRY	Specifies whether your product region attempts to reopen the VTAM ACB.	
AOMCUTOK	Sets the option for consoles to use SAF UTOKENS.	AS
AOMMLTO	Specifies the maximum time for collecting a multiline WTO message completely.	AS
AOMPRFJI	Specifies whether the JES job ID prefixes the message text on an OCS panel.	AS
AOMPRFJN	Specifies whether the z/OS job name is to prefix the message text on an OCS panel.	AS
AOMPRFMN	Specifies whether the minor lines of multiline WTO messages have SYSCMD prefixes inserted.	AS
AOMPRFSN	Specifies whether the originating system name prefixes the message text on an OCS panel.	AS

SYSPARM	Description	Product Code
AOMPRFTM	Specifies whether to prefix the message text on an OCS panel with the time the message was issued.	AS
AOMSSID	Specifies the subsystem ID used by the SYSCMD facility.	AS
AOMTRACE	Specifies whether the message tracing is active.	AS
AOMTRCRC	Specifies how message routing codes are formatted.	AS
AOMTRLIM	Specifies the tracing limit for AOMTRACE.	AS
AUTOEXEC	Specifies whether your product region attempts to execute an unrecognized command string as an NCL procedure.	
AUTOREXX	Specifies whether a START command recognizes and executes a data set member as REXX procedure.	
CALLSHR0	Specifies whether a subtask shares subpool zero with the main task when an &CALL statement is executed.	
CDELAY	Specifies the time your product region waits before sending output to an OCS terminal when a user is entering input from the keyboard.	
CNMACBNM	Specifies the name of the CNM ACB.	SN
CONMSG	Specifies whether the message N07002 is written to the activity log each time a terminal connects to the system.	
DALDEFER	Specifies whether deferred mounting is requested when allocating data sets.	
DALRACF	Specifies whether automatic RACF protection is requested when dynamically allocating new data sets.	
DALRLSE	Specifies whether data sets created by dynamic allocation are defined with the RLSE option.	
DESC	Specifies the operating system description codes used for messages sent to the system console.	
DSSISPST	Controls the format of generated ISPF statistics when Dataset Services is used to create or update a PDS member.	
DYNLMAX	Specifies the maximum number of dynamic INMC links that can be concurrently active.	
EDITCAPS	Specifies the default setting for the CAPS command.	
EDITNULL	Specifies the default setting for the NULLS command.	
EVCMDMIN	Specifies the minimum repeat frequency for the EVERY command.	
FTSCPROC	Specifies the name of an NCL procedure that intercepts commands issued on completion of system transmissions.	DS

SYSPARM	Description	Product Code
FTSFTM	Provides optional generation of additional data for some $$FTS events for use by CA NetMaster FTM.	
FTSMAXBK	Determines the maximum file block size that CA SOLVE:FTS processes.	DS
FTSRCDSN	Provides optional generation of an additional message (number N44807) at the end of a transmission, at the receiving system, that identifies the data set name into which the file has been received.	DS
FTSSMF	Specifies whether CA SOLVE:FTS generates SMF records on successful completion of transmission or receipt of a file.	DS
FTSTRDSN	Provides optional generation of an additional message (number N44307) at the end of a transmission, at the transmitting system that identifies the data set name just transmitted.	DS
HELDMSG	Specifies the default number of messages that are queued for an OCS window in HOLDING or AUTOHOLD mode, or if the window is closed.	
INMCBFSZ	Specifies the INMC buffer size for INMC traffic.	
INMCEX01	Defines the load module or phase name for the INMC primary security exit.	
INMCEX02	Defines the load module or phase name for the INMC secondary security exit.	
IPAMHB	Controls the use of heartbeats for TCP/IP INMC and APPC links.	
JRNLPROC	Specifies the NCL procedure to start when a journal swap occurs.	
JRNLSWAP	Indicates whether the NDB journal data set is automatically swapped if a space error occurs on the active journal.	
LANG	Specifies the language code for the system.	
LMSGWARN	Specifies the repeat frequency at which OCS operators are warned of lost messages.	
LNKTRACE	Specifies whether a trace message is issued each time an attempt to open a session to a remote region fails.	
LOCKPROC	Specifies the procedure that is invoked when a LOCK command is issued.	
LOGPAGE	Specifies the number of lines the activity log has on each page.	
MAIACBOR	Specifies the maximum number of retries permitted when opening an MAI ACB.	
MAIEX02	Specifies the name of an exit routine to take control whenever an MAI-OC session is started or ended.	
MAIEX02S	Specifies the way MAI-OC serializes calls to the MAIEX02 exit routine.	
MAIONL	Specifies whether MAI appends a new line character (X’15’) to data sent to the target application (that is, inbound from the terminal).	

SYSPARM	Description	Product Code
MAIOPREF	Specifies a one- to five-character string, which is used as the prefix to an LU name generated by MAI-OC.	
MAIOTRNS	Specifies the translate table used by MAI-OC.	
MAXRUSZ	Specifies the maximum request unit size for APPC sessions.	
MENULU1	Specifies an alternate soft menu for LU1 logons.	
MENUPROC	Specifies an alternate primary menu procedure name.	
MODLUSER	Specifies the name of a UAMS user ID definition, present on the UAMS data set, to use as a model for dynamic user generation.	
NCLEX01	Specifies the NCL general authorization exit.	
NCLGBTRC	Specifies the single global variable name or generic global variable prefix to trace as changes occur.	
NCLOGTRM	Specifies whether NCL writes log message N03906 on completion of each NCL procedure.	
NCLTRLFF	Specifies how many X'FF' field separators NCL places at the end of a record written to a UDB.	
NCLTRMAX	Specifies the number of NCL trace messages that are generated when an NCL procedure is invoked.	
NDBLOGSZ	Sets the number of VSAM logical records that are formatted as a journaling area when an NDB is created using the NDB CREATE command.	
NDBOPENX	Controls whether the nominated NCLEX01 is called for &NDBOPEN.	
NDBPHONX	Registers the name of the NCL phonetic exit program.	
NDBRUMIN	Sets the minimum adjacent record ID (RID) range to reuse.	
NDBRUSCP	Sets the percentage of used RID space to scan for reuse.	
NDBSCANO	Enables or disables the scan optimizer.	
NDBSUBMN	Sets the minimum number of subthreads that stay active, for any NDB, awaiting database requests that can run asynchronously.	
NDBSUBMX	Sets the maximum number of subthreads permitted.	
NONSWAP	(z/OS) Specifies whether this system is to run non-swappable or swappable.	
NRDLIM	Specifies the number of non-roll delete messages that the system queues before deleting the oldest messages.	
NSPRTINT	Sets the default timeout for solicited responses to commands sent to CA NetSpy.	

SYSPARM	Description	Product Code
NTSACCT	Specifies whether NTS accounting data is collected for selected sessions only, for all sessions, or for no sessions.	SN
NTSCINTV	Specifies the NTS correlation interval value.	SN
NTSCLOSE	Specifies whether to consider any sessions, which remain active when system initialization closes NTS, ended for the purpose or output logging.	SN
NTSCNMQ	Specifies whether NTS queues NTS CNM requests.	SN
NTSEVENT	Controls NTS event generation.	SN
NTSINTSV	Specifies whether NTS intensive message logging is active.	SN
NTSMAIEX	Specifies whether MAI sessions are presented to the NTS user exit.	SN
NTSMAISV	Requests that MAI inform NTS of any current MAI session and subsequent MAI sessions.	SN
NTSMAXTP	Identifies the maximum number of trace PIUs that a class definition or operator command can specify.	SN
NTSMAXTR	Identifies the maximum number of resources that can have a specific STRACE request outstanding.	SN
NTSRSINT	Specifies the interval length for collecting resource statistics.	SN
NTSRSLIM	Specifies how many NTSRSINT intervals can occur before the statistics collected for the oldest interval are overwritten.	SN
NTSRSTAT	Specifies whether resource statistics are collected.	SN
NTSSAWBF	Specifies the number range and size of the buffers allocated by VTAM for collecting SAW data.	SN
NTSSKEEP	Specifies the default session keep count for sessions written to the NTS database.	SN
NTSSMFTM	Specifies whether to cause CA NetMaster products to write timestamps in type 39 SMF records in local time or GMT.	SN
NTSTRBFX	Specifies whether the trace final queue buffers are consolidated when the first wrap occurs.	SN
NTSTRCBF	Specifies the number range and size of the buffers allocated by VTAM for collecting trace data.	SN
OCSHLITE	Specifies the type of highlighting to use for messages appearing in OCS windows.	
OCSTIME	Specifies whether the time appears at the end of the title line of an OCS window.	

SYSPARM	Description	Product Code
PANLBFSZ	Specifies the maximum outbound data stream size that can be generated for any terminal attached to your product region.	
PANLBUFF	Specifies the maximum number of pages of virtual storage that can be used for concurrent terminal output operations.	
PPOCOLOR	Specifies the color to use when displaying unsolicited VTAM (PPO) messages on OCS consoles.	
PPOHLITE	Specifies the type of highlighting used when displaying unsolicited VTAM messages on OCS consoles.	
PPOSOMSG	Specifies how PPO messages received from VTAM, as the result of VTAM commands entered from a system console or a local OCS window, are logged.	
PPOUSMSG	Specifies how unsolicited PPO messages are written to the activity log, regardless of DEFMSG options.	
PWEXPIRE	Specifies the number of days after which users are forced to change their password.	
PWMAX	Specifies the maximum acceptable length for passwords.	
PWMIN	Specifies the minimum acceptable length for passwords.	
PWRETRY	Specifies the number of times an incorrect password is accepted before a logon attempt is denied.	
ROUTCDE	Specifies the operating system routing codes to use for unsolicited messages sent to the system console.	
RXCSTACK	Specifies the working stack size (in KB) of the REXX compiler.	
RXISTG	Specifies the size (in KB) of the initial storage to get for a REXX process.	
RXMCSZ	Limits the maximum size (in KB) of a compiled REXX object.	
RXMSTG	Specifies the maximum amount of storage (in KB) a REXX process can use.	
RXQSFIX	Specifies whether to handle quoted string in REXX that has crossed multiple lines.	
RXRETAIN	Specifies the size (in KB) of the REXX retained procedure pool.	
RXXSTACK	Specifies the working stack size (in KB) of a REXX process.	
SESSMSG	Specifies whether trace message N35007 is issued each time a session to a remote system opens or fails.	
SMFID	Specifies the SMF record identifier to use in the generation of SMF records.	

SYSPARM	Description	Product Code
STGWRN	Specifies the number of kilobytes below the 16-MB line at which a N01801 message is issued as a WTO indicating that the storage thresholds have been exceeded.	
STGWRNXA	Specifies the number of kilobytes above the 16-MB line at which a N01801 message is issued as a WTO indicating that the storage thresholds have been exceeded.	
SYSCONMU	Specifies the default user ID for a master console user when it is not signed on.	
SYSCONNM	(z/OS) Specifies the LU name that is assigned to system console environments.	
SYSCONSO	(z/OS) Specifies whether the console user ID can default and whether signon is required.	
SYSCONUI	Specifies the default system console signon name.	
SYSCONXU	(z/OS) Specifies whether external console user IDs are used when signing on consoles.	
SYSLOG	(z/OS)Specifies whether none, all, or unsolicited VTAM messages written to the activity log, are to be written to the system log.	
SYSLOGFM	(z/OS) Specifies the format of the SYSLOG lines.	
TNDSREG	Specifies whether the Telnet server registers new connections with the Data Space Manager.	
TRACEOPT	Specifies the trace options to apply when tracing data streams sent to or from a terminal.	
USERPW	Specifies whether the NCL system variable &USERPW is available for use in MAI logon data.	
VDISPLAY	Specifies how the VTAM display command (D) is processed for users with command network partitioning.	
VTAMID	Specifies the system procedure name used for starting VTAM.	
XABELOW	Specifies whether your product region allocates buffer storage below the 16-MB line in XA systems if all storage in the extended private area has been used.	

SYSPARMS Operand Descriptions

ACBRETRY={ NO | YES }

Indicates whether your product region attempts to reopen the VTAM ACB. If YES, the system attempts to open the VTAM ACB during initialization. The system also attempts to reopen the ACB if it is closed at some time during normal processing (for example, if VTAM is shut down), at 30-second intervals.

Default: YES

AOMCUTOK={ NO | YES }

Sets the option for consoles to use SAF UTOKENs, which requires the use of a user security exit that returns UTOKENs.

Note: UTOKEN usage is supported for both JES and EXTMCS consoles.

This operand cannot be changed when AOM is active or when consoles are acquired.

Default: YES

AOMMLTO=*number*

Specifies the maximum time (in seconds) that the SYSCMD facility allows for any one multiline WTO to be collected completely. If this time-out value is exceeded and the end line is not seen, the multiline WTO undergoes further processing by AOMPROC, and so on.

Default: 5

Limits: 2 to 60

AOMPRFJI={ NO | YES }

Specifies if the JES job ID is to prefix the message text when displayed at an OCS screen, for messages sourced by an z/OS system. The value of this parameter is used to set the message prefixing actions when a new OCS or NCL &INTCMD environment is created.

Default: YES

AOMPRFJN={ NO | YES }

Specifies if the z/OS job name is to prefix the message text when displayed at an OCS screen, for messages sourced by an z/OS system. The value of this parameter is used to set the message prefixing actions when a new OCS or NCL &INTCMD environment is created.

Default: NO

AOMPRFMN={ NO | YES }

Specifies if the minor lines of z/OS-sourced multiline WTO messages are to have SYSCMD prefixes inserted when displayed. The value of this parameter is used to set the message prefixing actions when a new OCS or NCL &INTCMD environment is created.

Default: NO

AOMPRFSN={ NO | YES }

Specifies whether to prefix the originating system name to the message when it is delivered to an OCS window. The value of this parameter is used to set the message prefixing actions when a new OCS or NCL &INTCMD environment is created.

Default: NO

AOMPRFTM={ NO | YES | HMS | HM }

Specifies if the time the message was issued is to prefix the message text when displayed at an OCS screen. The value of this parameter is used to set the message prefixing actions when a new OCS or NCL &INTCMD environment is created.

AOMPRFTM=YES or AOMPRFTM=HMS causes the time to be displayed as *hh:mm:ss*.

AOMPRFTM=HM causes the time to be displayed as *hh:mm*.

Default: YES

AOMSSID={ * | *sub-system-id* }

Specifies the subsystem ID for use by the SYSCMD facility. The asterisk (*) uses the first four characters of the job name or started task (STC) name.

Default: NETM

AOMTRACE={ NO | YES }

Specifies whether the message tracing is to be active (for the number of messages defined in AOMTRLIM).

If YES, all messages from the local operating system are logged with trace information.

Default: NO

AOMTRCRC={ HEX | LIST}

Specifies, for messages traced by AOMTRACE, how the message routing codes are to be formatted.

AOMTRCRC=HEX (the default) displays the routing codes in HEX format, showing 32 hexadecimal digits (corresponding to 16 bytes, or 128 bits, of routing codes).

AOMTRCRC=LIST displays the routing codes in list format, with numbers or ranges of numbers indicating the routing codes.

Default: HEX

AOMTRLIM=*number*

Specifies the tracing limit. When reached, AOMTRACE is set to NO.

Default: 100

Limits: 1 to 100

AUTOEXEC={ NO | YES }

If an unrecognized command string is entered from an OCS terminal, this operand specifies whether your product region assumes that it is the name of an NCL procedure which it then attempts to execute.

If AUTOEXEC=NO is specified, unrecognized strings are rejected with an error message.

If AUTOEXEC=YES is specified and the string is a potential NCL procedure name (that is, a valid member name), your region generates a START command for commands entered from OCS or an EXEC command for commands issued by an NCL procedure. If the string is not the name of a defined NCL procedure the command is then rejected.

Default: YES

AUTOREXX={ NO | YES }

Specifies whether a START command recognizes and executes a data set member as REXX procedure:

- YES executes members as REXX procedures.
- NO executes members as NCL procedures.

Default: NO

CALLSHR0={ NO | YES }

Specifies whether subpool zero is to be shared between &CALL subtasks and your product region's main task.

When &CALL statements are executed, a subtask is attached to execute the target load module. By default, the subtask does not share subpool zero with the main task. However, if multiple called modules open and process the same VSAM data set, VSAM can suffer abends unless subpool zero is shared.

Default: NO

CDELAY=*number*

Specifies the time (in seconds) your product region waits before sending output to an OCS terminal when a user is entering input on the keyboard.

OCS terminals can receive unsolicited output at any time. If a user is entering input on the keyboard and output becomes available, a contention condition arises (on SNA terminals) which prevents a terminal from accepting output until input is complete.

This contention is broken if it continues for more than the CDELAY interval by interrupting the keyboard input and forcing the available output to the terminal. Therefore, the CDELAY parameter should be set to an interval that provides a reasonable period for uninterrupted entry of commands on the keyboard without causing excessive delay before output can be sent. The default value of 15 seconds is usually adequate. CDELAY also applies to NCL panel display.

Default: 15

Limits: 0 to 300

CNMACBNM=*cnm_acb_name*

Specifies the name of the CNM ACB.

Limits: One to eight characters

CONMSG={ NO | YES }

Specifies whether your product region is to write message N07002 to the activity log each time a terminal is connected to the system.

If using EASINET, this message occurs each time a terminal is returned to EASINET control after being logged on to another application. The LOGPROC NCL procedure can intercept these messages and retain statistics on terminal usage and the length of time terminals remain connected to other applications.

Default: NO

DALDEFER={ NO | YES }

Specifies whether to request deferred mounting when allocating data sets.

Default: NO

DALRACF={ NO | YES }

Specifies whether automatic RACF resource protection is requested when dynamically allocating new data sets.

Default: NO

DALRLSE={ NO | YES }

Specifies whether data sets created by dynamic allocation are defined with the RLSE option to free unused secondary extents.

Default: NO

DESC={ (*n,n,n*) | NONE }

Defines the operating system descriptor codes used for messages sent to the system console, including messages associated with the *pppp*OPER user ID. Specify NONE to cancel any previously set description codes.

Note: For an explanation of the impact of specifying certain codes, see the appropriate operating system documentation.

Default: NONE

Limits: 1 to 16 and NONE

DSSISPST={ EXT | NO | OEXT | STD }

Controls the format of generated ISPF statistics when Dataset Services is used to create or update a PDS member.

- EXT always generates statistics in extended format.
- NO does not generate statistics.
- OEXT generates statistics in standard format unless the value of a line counter is greater than 65535. In this case, the setting generates statistics in extended format.
- STD always generates statistics in standard format.

Default: STD

DYNLMAX=*number*

Specifies the maximum number of dynamic INMC links that can be active at the same time. Enter 0 to prevent any dynamic links from being established and to disable the dynamic facility.

Default: 10

EDITCAPS={ OFF | ON }

Specifies the default setting for the CAPS command when using Panel Services. OFF specifies that entered data is to be retained in upper and lower case format. ON specifies that entered data is to be converted to upper case. The default attribute can be changed during editing by the CAPS command. When a member is saved, Edit Services retains the current CAPS setting and reinstated that value when the member is next edited regardless of the setting of the EDITCAPS operand.

Default: OFF

EDITNULL={ ON | OFF }

Specifies the default setting for the NULLS command when using Panel Services. If OFF is specified, trailing blanks are retained on each edit line. If ON is specified, trailing blanks on each edit line are converted to nulls (X'00') before being displayed for editing. Using nulls on an edit line lets you use the insert key to insert data amongst other text on the line. Use the NULLS command to change the default attribute while editing.

When a member is saved, Panel Services retains the current NULLS setting and reinstates that value when the member is next edited, regardless of the setting for the EDITNULL operand.

Default: ON

EVCMDMIN=*number*

Determines the minimum repeat period (in seconds) permitted for an EVERY command. This can be used to stop the system from being flooded with timer commands inadvertently. If a value of 0 is specified, an EVERY command is executed immediately.

Default: 10

Limits: 0 to 300

FTSCPROC={ *procname* | NONE }

Specifies the name of an NCL procedure that intercepts commands issued on completion of system transmissions.

These commands are executed under the control of the background system (BSYS) environment, subject to BSYS's authorization level. If a greater degree of control over these commands is required, you can write an NCL procedure (an FTSCPROC) that is called whenever a terminating transmission attempts to issue a command. The command, with information about the terminating transmission, is passed to your FTSCPROC, which issues the command or suppresses it. To activate your FTSCPROC, set its name in this operand. If you issue SYSPARMS FTSCPROC=NONE, no FTSCPROC is used, and commands are executed directly.

Note: For more information, see the *Administration Guide*.

Default: NONE

FTSFTM={ YES | NO }

Specifies whether extended event data is created for $$FTS events for use by CA NetMaster FTM.

Note: For more information, see the *Network Control Language Reference Guide*.

Default: NO

FTSMAXBK={ 32K | 64K }

Determines the maximum file block size that CA SOLVE:FTS processes.

In some circumstances (for example, tape data sets created with block sizes greater than 32 KB), the 64K setting is required to process the files successfully.

Default: 32K

FTSRCDSN={ NO | SYS | ALL | LOG }

Provides optional generation of an additional message (number N44807) at the end of a transmission at the receiving system. The message identifies the data set name into which the file has been received.

- SYS specifies that the extra message is generated only for SYSTEM transmissions.
- ALL specifies that the message is generated for all transmissions.
- LOG specifies that the message is generated for all transmissions but is written to the activity log only.

For SYS or ALL, the message is written both to the activity log and to OCS operators profiled to receive FTS messages. The generation of this extra message enables the LOGPROC NCL procedure to do the following:

- Monitor the successful completion of transmissions.
- Generate dynamically JCL job streams that can be submitted to process the data set just received.

Default: NO

FTSSMF={ NO | YES }

Specifies whether CA SOLVE:FTS generates SMF records on successful completion of transmission or receipt of a file.

Generation of SMF records is possible only if CA SOLVE:FTS has been assigned an SMF record identifier to be used on all SMF records generated by the system. This identifier is set using the SMF parameter group of the Customizer.

Default: NO

FTSTRDSN={ NO | SYS | ALL | LOG }

Provides optional generation of an additional message (number N44307) at the end of a transmission at the transmitting system. The message identifies the data set name just transmitted.

- SYS specifies that the extra message is generated only for SYSTEM transmissions.
- ALL specifies that the message is generated for all transmissions.
- LOG specifies that the message is generated for all transmissions but is written to the activity log only.

For SYS or ALL, the message is written both to the activity log and to OCS operators profiled to receive CA SOLVE:FTS messages.

Default: NO

HELDMSG=(*xxx,yyy*)

xxx defines the default number of messages that are queued for an OCS window in HOLDING or AUTOHOLD mode, or where the window is closed. When this limit is reached, the earliest messages are discarded to allow the latest messages to be queued and a warning that messages are lost is sent to the terminal. *yyy* defines the maximum depth of the message queue that any user can request when using the PROFILE HOLD command. This lets you limit the size of any individual operator's message queue by overriding the default range of the PROFILE HOLD command.

Default: (200,999)

Limits: 10 to 999, and *xxx* cannot exceed *yyy*.

INMCBFSZ=*number*

Specifies the INMC buffer size (in KB) for all INMC traffic. This size is the default for all outbound messages on INMC sessions except for those sessions whose bind specifies a maximum RU size smaller than INMCBFSZ. For these sessions, the message size is equal to or smaller than the bind RU size.

Increasing INMCBFSZ can improve performance on high speed links, such as channel-to-channel or microwave links. Slow links can benefit from a lower INMCBFSZ value.

This operand can be changed at any time. However, the changed value of INMCBFSZ is not reflected in active links until they are stopped, reset, and restarted.

Default: 4

INMCEX01={ *exitname* | NONE }

Defines the load module for the INMC Primary Security Exit to be invoked whenever any INMC link becomes active. *exitname* is any valid module name. If you specify NONE at a later stage, the definition of any existing primary exit is canceled. This operand is applicable only for systems configured with INMC.

Default: NONE

INMCEX02={ *exitname* | NONE }

Defines the load module for the INMC Secondary Security Exit to be invoked whenever any INMC link becomes active. *exitname* is any valid module name. If you specify NONE at a later stage, the definition of any existing secondary exit is canceled. This operand is applicable only for systems configured with INMC.

Default: NONE

IPAMHB={ NO | (a,b) }

Controls the use of heartbeats for TCP/IP INMC and APPC links.

IPAMHB=NO disables heartbeats for INMC/APPC links using TCP/IP (regardless of the setting on the other side).

IPAMHB=(*a*,*b*) sets up heartbeats as follows:

- *a* is the heartbeat send interval, in seconds. The valid range is 10 through 100.
- *b* is the heartbeat loss toleration count. The valid range is 2 through 5.

If no heartbeats are received in (*a***b*) seconds from the other side of the session, then the session is closed. For INMC, the link is retried later.

If both sides of a link want heartbeats, then the *minimum* of each value is used; that is, the minimum of the two send intervals and the minimum of the two loss toleration counts.

Default: NO

JRNLPROC=*procname*

Specifies the NCL procedure to be started when a journal swap occurs.

Default: $NDJPROC

JRNLSWAP={ NO | YES }

Specifies whether the NDB journal data set is to be swapped automatically if a space error occurs on the active journal.

When YES is specified, the journal is swapped to the alternate journal if the file full condition occurs.

When NO is specified, the journal error prevents further updates to journaled NDBs and any updates in progress are held over until the NDB is successfully restarted.

Default: YES

LANG={ US | UK | *cc* }

Defines the language code for the system and the default language code for users.

Note: For the system recognized values that can be used to replace the *cc* option on this operand, see the *Network Control Language Reference Guide*.

Default: US

LMSGWARN=*number*

Specifies the repeat frequency at which OCS operators are warned of lost messages when in HOLDING, AUTOHOLD, or FS-HOLD mode. The warning message appears every *number* messages lost.

Default: 10

Limits: 1 to 999

LNKTRACE={ NO | YES }

Specifies whether a trace message is to be issued each time an attempt to open a session to a remote region fails.

If YES is specified, the system issues an N35006 trace message to Monitor status users each time an attempt to open a session to a remote system fails for any reason. The system retries such failures indefinitely at 60 second intervals until the session is opened or the link is stopped. If a remote system cannot be contacted, turn on this trace and examine the content of the LNKTRACE message to help resolve the cause of failure.

Default: NO

LOCKPROC=*procname*

Specifies the LOCK command procedure. This procedure is invoked when a user enters the LOCK command to lock the terminal.

Default: $NMLOCK (supplied procedure)

LOGPAGE=*number*

Defines the number of lines per page of the activity log. This operand must be executed near the start of the NMINIT initialization procedure to become immediately effective. Values of 30 to 250 can be specified.

Default: 60

MAIACBOR=*nn*

An MAI ACB name is constructed using a prefix and a numeric suffix. When an ACB fails to open, the suffix is incremented and the ACB open is retried. There are two types of failure:

- A failure because the ACB is in use or inactive (non-error situation)
- A failure for any other reason (error situation)

There is no limit set on the number of retries allowed for non-error failures.

This operand sets the maximum number of consecutive retries allowed when an MAI ACB fails to open in an error situation.

When an ACB fails to open in a non-error situation, the retry limit is reset to the value of this operand.

Default: 5

Limits: 5 to 99

MAIEX02={ *exitname* | NO }

Specifies the name of an exit routine to take control whenever an MAI-OC session (both MAI-OC and MAI-FS) is started or ended and optionally when the VTAM ACB has been opened. The exit routine also receives notification of the LU name chosen by MAI. This routine is given information about the session to be created and can validate and alter those details, as well as having the capability of refusing the session. In addition, the routine has the capability of correlating information across session start and end calls. The MAIEX02 parameter supplies the name of the user exit routine to perform this function. MAIEX02=NO indicates that an existing exit is to be disabled or that no exit is required.

MAIEX02S={ SYSTEM | USER }

Specifies the way in which MAI serializes calls to the MAIEX02 exit routine. MAIEX02S=SYSTEM, the default, ensures that all calls to the routine are, in effect, queued within any one system, while MAIEX02S=USER only queues concurrent calls at an individual user level.

MAIONL={ NO | YES }

Specifies whether or not MAI will append a new line character (X'15') to data sent to the target application (that is, inbound from the terminal).

SYSPARMS MAIONL=YES, the default, appends a new line; SYSPARMS MAIONL=NO does not.

Default: YES

MAIOPREF=*prefix*

Specifies a character string which is used as the prefix to an LU name generated by MAI-OC, for example:

```
SYSPARMS MAIOPREF=MAI02
```

If the SYSPARMS MAIOPREF operand is not coded, MAI-OC assumes a default prefix of NMMAV.

Limits: One to five characters

MAIOTRNS=(*xx,yy*)

When data is received from an application across an MAI-OC session, MAI-OC translates, by default, any characters below X'40' to an underscore (_) before displaying it at an OCS window and leaves all other data intact. The MAIOTRNS operand can be used to alter the translate table used by MAI-OC in this process. The value *xx* is two hexadecimal digits representing a value to be translated and *yy* two hexadecimal digits representing a value into which *xx* is to be translated. The *yy* value must represent a *printable* character.

For example, to translate a hexadecimal zero (X'00') to a blank, specify:

```
MAIOTRNS=(00,40)
```

MAXRUSZ=*number*

Specifies the maximum request unit size for APPC sessions. If necessary this value overrides the LU6.2 session BIND parameters. The value specified on this command applies to new sessions established after the command is complete. The default value is 4096. The value specified is converted to a single byte RU size of the form X'*ab*' where number=*a**2***b*. Values must be in the range 128 to 32768 and the values which cannot be converted directly are rounded down.

MENULU1=*procname*

Specifies an alternate menu for LU1 logons.

Default: $NMPMLU1 (supplied procedure)

MENUPROC=*procname*

Specifies an alternate primary menu procedure name.

Default: $NMPMENU (supplied primary menu procedure)

MODLUSER={ *userid* | NONE }

Specifies the name of a UAMS user ID definition, present on the UAMS data set, to be used as the model for dynamic user ID generation. Use the following scenarios to determine the most appropriate action for your system:

- If you do not want to specify a model for dynamic user ID, specify NONE or let it default.
- If this operand is coded and a user attempts to log on to a product region with an unknown user ID, but their password is that associated with the model user ID, the system automatically creates a new user ID for the unknown user. This ID has exactly the same attributes and privileges as the model user ID.
- If a password security exit is implemented, the exit can alter the model name that is to be used.
- If a full security exit is implemented this operand is ignored.

Default: NONE

NCLEX01={ *exitname* | NO }

Specifies the name of the NCL authorization exit. This exit provides security for NCL procedures and &SMFWRITE verbs.

Note: For full information about NCLEX01, see the *Security Guide*.

If NCLEX01 is frequently invoked, use the LOAD MOD=*exit_name* command to load a re-entrant version of the exit into the region to eliminate the overhead of loading the exit for each authorization.

If NO is specified, then the current exit name is deleted and exit invocation is stopped.

Note: The NCLEX01 load module is executed under a subtask and can therefore issue I/O and WAIT operations without impacting the main system.

NCLGBTRC= { *name* | *prefix }**

Specifies a single global variable name, or a generic global variable prefix that is to be traced as changes occur to them. Each time an assignment occurs into a traced global variable, a log record is written that identifies the process performing the assignment. The first eight bytes of data are also traced.

If *name* is specified, only one global variable is traced. If *prefix* is specified, all global variables that start with the nominated prefix, excluding the standard global variable prefix, are traced as their values change.

The trace record is written as a single message, N23312, to the activity log. Tracing is turned off if no name or prefix is specified.

NCLOGTRM={ NO | YES }

Specifies whether NCL writes a log message on completion of each NCL procedure. If YES is specified, the log message provides statistics on NCL processing units used by the procedure.

Default: NO

NCLTRLFF={ ONE | MULT }

Specifies how many X'FF' field separators NCL places at the end of a record written to a UDB. If MULT is specified, and a record is written to a UDB where the record contains multiple null variables at the end, one X'FF' field separator is appended to the UDB record for each 'null' variable on the &FILEPUT or &FILEADD statement.

If NCL-format UDBs are created for processing by external systems, the use of this operand should be consistent.

Default: ONE

NCLTRMAX=*number*

Specifies the maximum number of NCL trace messages that are generated in any one invocation of an NCL procedure. If 0 is specified, all tracing is inhibited.

Default: 100

Limits: 0 to 9999

NDBLOGSZ=*n*

Sets the number of VSAM logical records that will be formatted as a journaling area when an NDB is created using the NDB CREATE command. This journal area provides transaction integrity across system failures.
If the LOGSIZE parameter is specified on NDB CREATE, it overrides this value.

This value can be changed prior to issuing an NDB CREATE command, to change the journal size for that database.

Journal size is influenced by the possible complexity of an add, update, or delete operation on the database, which in turn depends on such things as the size of the data record, and the number of keys being added. The journal automatically extends if it is under-allocated.

Note: For more information, see the *Network Control Language Programmer Guide*.

Default: 40

Limits: 10 to 200

NDBOPENX={ NO| YES }

Controls whether the nominated NCLEX01 is called for &NDBOPEN.

NDBPHONX=*name*

Registers the name of the NCL phonetic exit program.

NDBRUMIN=*nnn*

Sets the minimum number of consecutive RID numbers that can be reused. You can change this operand at any time.

Default: 20

Limits: 10 to 100

NDBRUSCP=*nnn*

Sets the percentage of RID space to be scanned to collect RIDs for reuse. Values of 95 or greater cause the complete NDB to be scanned. For an NDB that is scanned daily, a default value of 15 means that the NDB is scanned completely every week. You can change this operand at any time.

Default: 15

Limits: 5 to 100

NDBSCANO= { NO | YES }

Enables (YES) or disables (NO) the scan optimizer.

Notes:

- The setting of the NDBSCANO value does not affect NDBs that are already started at the time the command was issued.
- An individual NDB can override the setting of the NDBSCANO command using the OPTIMIZE operand of the NDB START command.

Default: YES

NDBSUBMN=*n*

Sets the minimum number of subthreads that will stay active, for any NDB, awaiting database requests that can run asynchronously (&NDBSCAN and &NDBGET requests). When a database request arrives that can be run asynchronously, the database handler starts a separate copy of itself to run that request, unless there are already NDBSUBMX subthreads running. As the subthreads run out of work, they terminate unless the NDBSUBMN limit is reached.

Default: 3

Limits: 0 to 20

NDBSUBMX=*n*

Sets the maximum number of subthreads allowed. See NDBSUBMN.

Default: 5

Limits: 1 to 20

NONSWAP={ YES | NO }

Specifies whether this system is to run non-swappable (YES), or swappable (NO). This operand is valid only if your product region is running authorized.

For z/OS and MSP, your product region makes itself non-swappable automatically before system initialization. The NONSWAP operand can be utilized to change this status either during initialization or at any time after.

For VOS3, if your product region is authorized, it runs swappable, by default. It can be changed to run non-swappable by specifying YES. However, once running non-swappable, it is not possible to change the status back to swappable without stopping and restarting the system.

Note: For z/OS and MSP, optional features which require non-swappable operation blocks attempt to revert to swappable operation.

NRDLIM=*number*

Specifies the maximum number of NRD messages that the system queues at any time before discarding the oldest messages. This queue is used by the NRDRET command to refresh the OCS NRD message display.

Default: 200

Limits: 10 to 10000

NSPRTINT=*interval*

Sets the interval between retries when trying to connect to a CA NetSpy region. It is an integer number of seconds.

Default: 30

Limits: 10 to 600

NTSACCT={ SELECTIVE | ALL | NO }

Specifies whether NTS accounting data is to be collected for selected sessions only, for all sessions, or for no sessions. NTSACCT=SELECTIVE means that NTS attempts to collect accounting data for those sessions which have a *sawclass* specifying ACCT=YES (see the DEFCLASS command). NTS starts a specific trace for the primary resource if possible, otherwise the secondary resource if possible, to gather accounting information. No attempt is made to stop such selective tracing. This option is best used when accounting data is required only for a few applications in the host system. If NTSACCT=ALL is specified, then NTS starts tracing all network activity and collects accounting information for all sessions regardless of any *Saw class* parameters. If NTSACCT=NO is specified, then NTS does not collect any accounting information regardless of session parameters. Should any accounting be active when this is requested it ceases immediately. Once session awareness processing is active, only NTSACCT=NO can be specified. To change the SYSPARMS accounting value to either of the other options while session awareness is active, it must first be stopped, the command entered, and then session awareness restarted.

Default: SELECTIVE

NTSCINTV=*nn*

Specifies the NTS correlation interval value, where *nn* is a number of seconds. This value represents the maximum interval that NTS is prepared to wait for certain different types of data to be correlated. For example, trace information can arrive ahead of the session notification for a particular session. If this occurs NTS queues such data and solicits the latest session information from VTAM. However, if the session data for the traced session does not arrive within the elapsed time of the correlation interval all uncorrelated data is purged. Similarly, if there is outstanding data (such as trace or RTM data) yet to arrive after a session has ended, NTS is prepared to wait for it for up to the correlation interval specified. If this interval expires then logging proceeds regardless of whether all outstanding data has arrived. The default should be adequate for most networks.

Default: 30

NTSCLOSE={ NO | YES }

Specifies whether any sessions, which remain active when NTS is closed due to system initialization, are to be considered ended for the purpose of output logging. NTSCLOSE=NO means no active sessions are logged when NTS closes. If NTSCLOSE=YES is specified then those sessions still active are queued for output and time-stamped with the shutdown time. Such sessions are logged (according to the log options in effect) and are flagged with a C in subsequent NTS session selection lists indicating the session did not end normally but was closed by NTS. Because your product region only waits for a short period of time (about 10 seconds) between shutdown notification and actual termination, this technique is only useful where a small number of sessions remain which need to be logged. If a large number of sessions require closing before shutting down, the CLOSE operand of the NTS SAW STOP command is used to similarly close and log all active sessions before stopping.

Default: NO

NTSCNMQ={ NO | YES }

Specifies whether NTS is to queue NTS CNM requests. NTSCNMQ=YES means that all CNM requests are queued until they are replied to by VTAM. NTSCNMQ=NO means that NTS CNM requests are not queued, but issued immediately. Issuing NTSCNMQ=NO while NTS is active results in all queued NTS CNM requests being purged.

Default: YES

NTSEVENT={ NO | YES }

Controls NTS event generation. If you want events to be generated then you must specify SYSPARMS NTSEVENT=YES. Issue SYSPARMS NTSEVENT=NO to immediately terminate all NTS event generation irrespective of what class definitions are in place. Subsequently issuing SYSPARMS NTSEVENT=YES restarts generation as per the current class definitions.

Default: NO

NTSINTSV={ NO | YES | *name_mask* }

Specifies whether NTS intensive message recording is active. By enabling this function, certain activities can be tracked, such as the purging of uncorrelated trace data, and dumping of unrecognized entries in the trace buffer. This option is not usually required under normal operation.

name_mask

Specifies a mask that enables intensive message recording for certain LUs and PUs only.

Wildcards: * (any number of characters) and ? (one character)

Default: NO

NTSMAIEX={ NO | YES }

Specifies whether MAI sessions are presented to the NTS user exit. NTSMAIEX=NO indicates that NTS does not present MAI sessions to the NTS user exit. NTSMAIEX=YES indicates that an SMF type 39 record is built for MAI sessions and presented to the NTS user exit.

Note: For information about the record format, see the CA NetMaster NM for SNA *Administration Guide*.

Default: NO

NTSMAISV={ NO | YES }

Requests that MAI inform NTS of any current MAI session and subsequent MAI sessions. NTS must be activated before MAI session visibility becomes effective. SYSPARMS NTSMAISV=YES can be specified after NTS and MAI are already active and causes MAI to notify NTS of all currently existing MAI sessions. If NTSMAISV=NO is specified after the interface is active, sessions currently visible to NTS remain so but MAI does not notify NTS of new sessions.

Default: NO

NTSMAXTP=*nnn*

Provides the maximum number of trace PIUs that any class definition or operator command can specify, as either the initial or final trace queue depth for any session.

Default: 100

NTSMAXTR =*nnn*

Provides the maximum number of resources that can have a specific STRACE request outstanding. This includes both trace start requests in normal operation, and trace stop requests where global tracing is active and the resource is to be excluded. The number also includes those resources for which NTS started tracing to collect accounting data.

Default: 100

NTSRSINT=*nnn*

Specifies the interval length for resource statistics collection in minutes.

Default: 30

Limits: 1 through 480 (eight hours)

NTSRSLIM=*nnn*

Specifies how many of the NTSRSINT intervals can occur before the statistics collected for the oldest interval are overwritten. This operand can be overridden selectively using the LIMIT operand of the DEFCLASS RESOURCE command. If this parameter is not specified and the relevant NTS resource class does not specify a LIMIT parameter, the default number of intervals is used.

Default: 16

Limits: 0 through 255

NTSRSTAT={ NO | YES }

Specifies whether to collect resource statistics. If this parameter is not specified, or NTSRSTAT=NO is specified, then resource statistics collection is disabled. This means that no resource statistics are collected, irrespective of options set in resource class definitions. Once session awareness (or SAW) is enabled, only NTSRSTAT=NO can be specified.

Default: NO

NTSSAWBF=(*n*,*s*K)

Specifies the number and size of buffers that VTAM allocates for collecting session awareness data.

n

Specifies the number of buffers.

Default: 2

Limits: 2 through 255

s

Specify the buffer size in KB.

Default: 4

Limits: 2 through 32

NTSSKEEP=*nn*

Specifies the system default session keep count for sessions written to the NTS database. The number nn represents the maximum number of session incidences kept in the database for any specific session name pair. When a session ends and is written to the database, this value is placed in the session master record. You can use the NTSDBMOD command to modify this value. The real name and network of both session partners determine a session name pair. The default value of 10 means that only the ten most recent sessions for a session name pair are kept in the database. As each session ends, it is added to the database until the session count is reached after which any new sessions replace the oldest ones.

Default: 10

Limits: 1 through 255

NTSSMFTM={ GMT | LOCAL }

Specifies whether to write timestamps in type 39 SMF records in GMT or local time.

All application timestamps in type 39 SMF records consist of the first four bytes of the system TOD clock value, plus a 4-byte signed number for the time zone adjustment value, in seconds. By definition, the first four bytes represent GMT time in approximately 1-second intervals. However, NetView (NLDM) writes the first four bytes of these timestamps in local time.

Default: GMT

NTSTRBFX={ NO | YES }

Specifies whether the trace final queue buffers are to be consolidated when the first wrap occurs. For sessions experiencing heavy traffic, the trace final queue might wrap frequently. If trace buffers are allocated from a large set of pages, and tracing is enabled for many sessions, the paging overhead on the system might be considerable. Specifying NTSTRBFX=YES causes NTS to use a contiguous buffer pool for the allocation of trace buffers for a single session. This effectively fixes the pages in memory and therefore reduces the paging overhead. The movement of the contents of the trace buffers on the trace final queue into the contiguous storage buffer occurs when the trace final queue wraps for the first time.

Default: YES

NTSTRCBF=(*n*,*s*K)

Specifies the number and size of buffers that VTAM allocates for collecting trace data.

n

Specifies the number of buffers.

Default: 4

Limits: 2 through 255

s

Specify the buffer size in KB.

Default: 4

Limits: 2 through 32

OCSHLITE={ NONE | REVERSE | BLINK | USCORE }

Specifies the type of highlighting to be used for messages in OCS windows normally displayed in high intensity. The following options can be specified:

NONE specifies that messages are presented without change.

REVERSE specifies that messages are presented in reverse video.

BLINK specifies that messages are to blink.

USCORE specifies that messages are underscored.

For terminals that support color, the default color applies. This operand is ignored for terminals that do not support IBM extended highlighting and does not apply to individual high intensity fields resulting from comment lines from NCL procedures that commence with a plus sign (+) and that use the at symbol (@) field highlighter.

Default: NONE

OCSTIME={ NO | YES }

Specifies whether the time appears at the end of the title line of an OCS window. If YES is specified, the current time in the format HH.MM is placed at the left hand end of the title line of an OCS window each time the window display is updated. This allows operators to determine when the last message occurred if the terminal has been left temporarily unattended. Specifying NO resets this option.

Default: YES

PANLBFSZ=*number*

Specifies the maximum outbound data stream size (in KB) that can be generated for any terminal attached to your product region.

If your network contains terminals that might receive large data streams (for example, complex extended data stream screen formats) you might need to increase the PANLBFSZ operand. A message is issued if an attempt is made to display a panel that is too large for the current PANLBFSZ setting.

Default: 16

Limits: 4 to 20

PANLBUFF=*number*

Specifies the maximum number of pages of virtual storage to be used for concurrent terminal output operations. If 0 is specified, no limit is imposed.

This parameter acts as a throttle for simultaneous output to large numbers of terminals (for example, during broadcast processing or when starting a large EASINET network). Increase this number to speed up network start-up and broadcasting, decrease it to throttle back these activities.

Before increasing this value, consider any effects an increase in virtual storage usage might have on other functions.

Default: 40

Limits: 0 to 32767

PPOCOLOR=*color*

Specifies the color to be used when displaying unsolicited VTAM (PPO) messages on OCS consoles.

PPO messages are displayed in high intensity on non-color devices.

Default: WHITE

Limits: BLUE, RED, PINK, GREEN, TURQUOISE, YELLOW, WHITE, and NONE

PPOHLITE={ NONE | REVERSE | BLINK | USCORE }

Specifies the type of extended highlighting used for unsolicited VTAM messages sent to OCS windows. The following options can be specified:

NONE	Messages are presented without change.
REVERSE	Messages are presented in reverse video.
BLINK	Messages are to blink.
USCORE	Messages are underscored.

This operand is ignored for terminals that do not support IBM extended highlighting.

Default: NONE

PPOSOMSG={ LOG | NOLOG | LOGDEFMSG }

Specifies how PPO messages, received from VTAM as the result of VTAM commands entered from a system console or a local OCS window, are to be logged.

VTAM relays copies of the results of commands entered through system consoles if the MODIFY PPOLOG=YES VTAM command has been entered, or if PPOLOG=YES is specified in the VTAM initialization parameters.

The following options can be specified:

LOG

All PPO messages are logged. This is the default.

NOLOG

PPO messages are ignored.

LOGDEFMSG

Only DEFMSGed PPO messages are to be logged (that is, those which have one or more of the three delivery options enabled or EDS delivery enabled).

PPOUSMSG={ LOG | NOLOG | LOGDEFMSG }

Specifies how unsolicited PPO messages are to be logged, regardless of DEFMSG options. The following options can be specified:

LOG

All unsolicited PPO messages are logged. Further delivery of unsolicited messages is still performed according to DEFMSG rules.

NOLOG

No logging of unsolicited messages. This is the default.

LOGDEFMSG

Only DEFMSGed unsolicited messages are logged (that is, those which have one or more of the three delivery options enabled or EDS delivery enabled).

PWEXPIRE=*number*

Specifies the number of days after which users are forced to change their password. This operand takes effect the next time a user logs on. This operand has no effect if a security exit is in force that replaces the UAMS password maintenance functions. Enter a value of 0 to disable automatic password expiry.

Default: 30

Limits: 1 to 366

PWMAX=*number*

Specifies the maximum acceptable length for passwords. This operand only takes effect from the next password change a user makes. The operand has no effect if a security exit is in force that replaces the UAMS password maintenance functions.

Default: 8

Limits: Value of PWMIN to 8

PWMIN=*number*

Specifies the minimum acceptable length for passwords. This operand only takes effect from the next password change a user makes. The operand has no effect if a security exit is in force that replaces the UAMS password maintenance functions.

Default: 3

Limits: 1 to the value of PWMAX

PWRETRY=*number*

Specifies the number of password violations that are accepted before a logon attempt is denied. If the number is reached, a warning message is sent to all terminals with Monitor status, advising them of the user ID and terminal involved in the violation. This operand has no effect if a security exit is in force that replaces the UAMS password maintenance functions.

Default: 2

Limits: 1 to 10

ROUTCDE=(*n,n,n*)

Specifies the operating system routing codes to use for unsolicited messages sent to the system console (that is, to the *pppp*OPER user ID).

Note: For an explanation of the impact of specifying certain codes, see the appropriate operating system guide.

Default: 1,8,11

Limits: 1 to 16

RXCSTACK=*n*K

Specifies the working stack size (in KB) of the REXX compiler.

Default: 3

Limits: 3 to 16

RXISTG=*n*K

Specifies the size (in KB) of the initial storage to get for a REXX process. A nonzero value avoids startup overhead.

Default: 32

Limits: 0 to 128

RXMCSZ=*n*K

Limits the maximum size (in KB) of a compiled REXX object.

Default: 256

Limits: 64 to 512

RXMSTG=*n*K

Specifies the maximum amount of storage (in KB) a REXX process can use.

Default: 4096

Limits: 32 to 10258

RXQSFIX={ NO | YES }

IBM REXX interpreters let quoted strings extend across multiple lines. The GREXX Compiler does not handle this by default. If RXQSFIX is set to YES, then quoted strings that extend across multiple lines are converted with all trailing blanks stripped. The string still cannot be larger than 250 bytes in length.

Note: There is one circumstance where the resulting REXX source, while syntactically correct, may not execute correctly. If the repaired string has a REXX operator of higher precedence than concatenate (||), the resulting expression is processed in the wrong order.

Default: NO

RXRETAIN=*n*K

Specifies the size (in KB) of the REXX retained procedure pool.

0 specifies that no dynamically loaded procedures are retained.

Default: 200

Limits: 0 and 10 to 2048

RXXSTACK=*n*K

Specifies the working stack size (in KB) of a REXX process.

Default: 4

Limits: 3 to 16

SESSMSG={ NO | YES }

Specifies whether trace message N35007 is issued each time a session to a remote system opens or fails. If YES is specified, the system issues the trace message to Monitor status users, each time a session to a remote system is opened or fails. The system retries any failures indefinitely at intervals specified in the LINK command until the session is opened or the link is stopped.

This option can be particularly useful in an INMC operation, as it might be the only way to identify the fact that not all sessions making up a link are operational. If any sessions are open the link remains operational-the failure of an individual session does not disrupt traffic, but can affect performance. The default is NO.

Default: NO

SMFTRACE=*number*

Requests the dump of written SMF records.

STGWRN=*number*

Specifies the number of kilobytes below the 16-MB line at which an N01801 message is issued as a WTO indicating that the storage thresholds have been exceeded. This message can be repeated at 30-second intervals until the storage use drops below the threshold.

Default: 0 (no warning limit)

Limits: 0 to 16,000

STGWRNXA=*number*

Specifies the number of kilobytes above the 16-MB line at which an N01801 message is issued as a WTO indicating that the storage thresholds have been exceeded. This message can be repeated at 30-second intervals until the storage use drops below the threshold.

Default: 0 (no warning limit)

Limits: 0 to 1,000,000

SYSCONMU=*name*

Specifies the default user ID for a master console that issues commands to your region when it is not signed on to the security system in use.

SYSCONMU can be set only during NMINIT. For master consoles that are not signed on to your security system, this user ID always applies, regardless of the setting of the SYSPARM SYSCONSO.

If this default user ID is not defined to your security system, then the user ID .MASTOP (which has a hard-coded profile) is used.

Note: For more information about master console user ID requirements, see the *Security Guide*.

Default: *pppp*MSOP, where *pppp* is the system user prefix

Limits: One to eight characters

SYSCONNM={ EXTMCS | ALL }

Specifies the LU name that is assigned to system console environments. The following options can be specified:

- EXTMCS specifies consoles with console IDs in the range 0 to 99. The consoles are named CONSOLE (0) or CONS#*nn*, where *nn* is 01 to 99. Console IDs outside this range (that is, extended MCS consoles) use the extended MCS console name.
- ALL specifies that the LU name is always the z/OS-assigned console name. This means that Console 0 is INTERNAL, the master is MASTER, and so on.

Default: EXTMCS

SYSCONSO={ DEFAULT | NO | REQUIRED }

Specifies whether the console user ID can default and whether signon is required. It is relevant to all operating system environments. The following options can be specified:

- DEFAULT specifies that the default SYSCONUI user ID name is used to sign on if the system console user ID is not defined in the UAMS security system.
- NO specifies that all consoles are signed on using the SYSCONUI user ID name.
- REQUIRED specifies that the user ID must be defined, otherwise the signon fails. This option is typically only used if SYSCONXU=YES is in effect.

Note: There are interactions between the SYSCONSO and SYSCONXU parameters.

Default: DEFAULT

SYSCONUI=*name*

Specifies the default system console signon name. The *name* must be a valid user ID.

Note: The user ID is not used unless it exists in the security system in use.

Note: For more information about console user ID requirements, see the *Security Guide*.

Limits: One to eight characters

SYSCONXU={ NO | YES }

Specifies whether or not external console user IDs are to be used when signing on consoles. The following options can be specified:

- NO specifies that the system-supplied user ID is not used.
- YES specifies that the system-supplied user ID is used. However, it is only used if the system passes a RACF UTOKEN with the command. If no token is passed, or the console is not signed on to RACF, the console is treated as not signed on, and the action taken depends on the value of SYSCONSO. If the master console user ID, *BYPASS*, is seen, a special internal user ID of .MASTOP is used to indicate that this is the master console. It is not signed on to RACF.

Note: There are interactions between the SYSCONXU and SYSCONSO parameters.

Default: NO

SYSLOG={ NO | YES | PPO }

Specifies whether none, all, or unsolicited VTAM messages written to the activity log, are also written to the system log. The following options can be specified:

- NO writes no messages to the system log.
- YES copies everything written to the activity log to the system log.
- PPO writes all unsolicited VTAM messages to the system log and the activity log.

Default: NO

SYSLOGFM={ MVS | MSP }

Specifies the format of the SYSLOG lines produced if SYSLOG=YES or SYSLOG=PPO.

Format a line with four zeroes for ROUTCDE, time, and user ID in the JOBID column.

TNDSREG={ NO | YES }

Specifies whether the Telnet Server will register new connections with the Packet Analyzer, for use by any CA NetMaster NM for TCP/IP regions on the same z/OS image.

Setting NO means connections are not registered.

Default: YES

TRACEOPT=*cc*

Specifies the trace options to be applied when tracing data streams sent to or from a terminal. The value of *cc* is the character representation of a hexadecimal byte.

The following bit values represent valid trace options:

```
B'10000000'(X'80')   Trace only first 256 bytes of each
                     message.
B'00000001'(X'01')   Trace output before compression.
B'00000010'(X'02')   Trace output after compression.
B'00000100'(X'04')   Trace input from terminal.
```

Default: 06

Example:

```
SYSPARMS TRACEOPT=80
```

indicates that the tracing options required correspond to a hex byte with a value of X'80'. This byte in turn represents an 8-bit string with the value:

```
B'10000000'
```

Example:

The value specified on the TRACEOPT parameter can be any combination of the four options, expressed as a hex character, for example:

```
SYSPARMS TRACEOPT=84
```

indicates a request to trace the first 256 bytes received from the terminal, with the data stream being written to the activity log. Data recorded can then be examined using the standard online log browse facilities.

Tracing is started and stopped by the LUTRACE command.

USERPW={ NO | YES | VERIFY }

Specifies whether the NCL system variable &USERPW is available for use in MAI logon data. &USERPW represents the user's product region password and is used when MAI sessions are created. This operand allows installations to control the availability of the &USERPW variable to MAI.

If YES or VERIFY is specified, the password is encrypted in storage so that it is not available in plain text. Specifying VERIFY indicates that MAI should prompt users for their password when a session is updated or added that contains &USERPW in the logon data.

Default: VERIFY

VDISPLAY={ CMD | MSG | ANY }

Specifies how the VTAM display command (D) is processed for users with command Network Partitioning. The following options can be specified:

- CMD lets users display only those resources within their defined command partitions.
- MSG lets users display only those resources within their defined message partitions. This can be used where resources within command and message partitions differ. In this case, the Inactive or Active status of message tables is ignored and all message tables are searched.
- ANY lets users display any resource, regardless of the resources specified within their partitions.

Default: CMD

VTAMID=*procname*

Specifies the system procedure name used for starting VTAM. If any other procedure name is used, then your product region must be informed of it so that the correct name can be used when generating VTAM commands.

Default: (ACF/VTAM and VTAM-G) NET or (ECS/VTAM) VTM

Limits: One to eight characters

XABELOW={ NO | YES }

Specifies whether your product region is to allocate buffer storage below the 16-MB line in XA systems if all storage in the extended private area has been used. NO means that if all XA storage in the product region address space has been used, further requests for XA storage by other processes fails, even if non-XA storage is still available below the line. Do not change this unless your installation requires your product region to run with a severely limited extended private area.

Default: NO

Appendix D: MAI Installation Exit MAIEX02

This section contains the following topics:

MAI Installation Exit

The installation-written exit MAIEX02 is supported by your product region. It can be invoked by MAI for exit initialization and termination and for MAI session initiation and termination. The exit can be used to perform the following functions:

- Validate the various parameters to be used on a session
- Refuse the session or change the parameters to be used
- Collect session accounting information
- Supply an LU name or LU name prefix to be used for a session
- Limit the number of sessions

How You Implement the MAI Exit

The exit must be link edited and placed into a load library accessible to your product region. In z/OS and z/VM systems, the exit must be link edited with the RENT option.

The name of the link edited exit module is identified to your product region by the SYSPARMS MAIEX02 operand.

The exit is typically written in assembler and can perform any processing required, including SVC calls and WAIT macros. This is because it operates under a subtask that is independent of the main product region task.

Note: Although executed under a subtask, the termination call to the exit when your region closes down is serialized. The termination call must complete before termination processing resumes.

Reentrant Code

You must write the exit to conform to the following rules:

- It is written in reentrant code
- It does not modify any storage location within itself
- Any working storage required other than that provided in the communications area is obtained using GETMAIN.

Failure to observe these conditions will result in an abend in the processing task and the session request will fail. Other processing is unaffected.

Storage Subpools

It is possible for the exit to maintain information across calls in GETMAIN storage, remembering the addresses of the storage in the various correlators. If this technique is to be utilized, the storage must be obtained in subpool 50. Storage obtained in any other subpool may be automatically freed when the exit returns to MAI or, in the case of storage obtained on a Session Start call, when that MAI session ends.

It is the responsibility of the exit to free any GETMAIN storage when necessary. MAI will never free storage obtained by the exit.

Exit Serialization

Because MAIEX02 is run in a subtask, it is possible for it to run concurrently for two or more different users. For example, while it is processing a Session Start call for one user, it could be called to process a Session End call for another. This could lead to complications where, for instance, the exit is maintaining a control block structure or changing a correlator. This is because the subsequent call may interrupt processing in the first call.

MAI provides two levels of serialization to overcome these problems, governed by the SYSPARMS MAIEX02S command.

First-level Serialization

The first level of serialization uses MAIEX02S=SYSTEM. This setting is the default and ensures that calls to the exit are serialized. In the previous example, the Session End call would not be made until the Session Start call had completed. This level is used where, for instance, the exit is maintaining a control block structure or where the various calls update the System Correlator. It ensures that a System Correlator set by one call is always passed to the next call.

The only drawback with this level of serialization is that the starting and ending of MAI sessions is *single-threaded* so that only one can proceed at a time. However, because the path through MAIEX02 is usually short and fast, this drawback is not a problem.

Second-level Serialization

The second level of serialization, MAIEX02S=USER, ensures that calls to the exit are serialized at a user level only. That is, the exit can concurrently process multiple calls for different users, but calls for any one user are serialized. This level protects the User Correlator, ensuring that if set by one call it is presented to the next call for that user correctly. However, it does not protect the System Correlator or any control block structure the exit maintains.

MAIEX02S=USER provides processing overlap advantages over the MAIEX02S=SYSTEM option. If the exit is purely validating or changing session parameters, you can use MAIEX02S=USER with safety.

Sample Exit

A sample exit, MAIEX02, is installed with your product in CC2DSAMP. We recommend that you assemble and study this before writing an exit. The macro $NMMAEX2 in the CC2DMAC data set must be available for this assembly to function correctly.

The sample shows a way in which the correlators can be used to count the number of MAI sessions a user has and the total number at any one time. It then limits the number of sessions allowed and rejects sessions if the counts pass a predetermined level. Because Session Start and End calls to the sample exit update the System Correlator, it requires the MAIEX02S=SYSTEM serialization level.

This sample also includes support for generating Pass tickets as used by the Secured Signon function of RACF and other external security products.

How the Exit Starts

To start the MAIEX02, use the SYSPARMS MAIEX02 command, naming the program that is to act as the exit. If the SYSPARMS command is included in the RMINIT procedure, an Exit Initialization call is made. Subsequent MAI session requests then call the exit. If the exit is not included in RMINIT but is invoked using command from a terminal, any existing users with MAI sessions have to log off before any calls are made to the exit for that user.

During the testing phases of the exit, you can force a new Initialization Call or to invoke an entirely different program. This can be accomplished by entering another SYSPARMS MAIEX02 command, specifying the same or a different program name. When the command is entered, an Initialization Call is made, with a zero System Correlator and any existing User Correlators are zeroed. In addition, MAI ensures that if any MAI sessions are in progress, the ending of those sessions does not cause a Session End call to the old or the new exit.

Registers on Entry to the Exit

When the exit is invoked, Register 1 contains the address of a fullword, which in turn contains the address of a communications area containing various parameters. This communications area can be mapped using a supplied macro, called $NMMAEX2. This macro provides a DSECT expansion to perform the mapping and detailed information about the content of each field.

Standard linkage conventions apply. On entry, the exit must save the contents of all registers (Register 13 contains the address of a save area) and on exit all registers must be restored to their contents on entry, with the exception of Register 15 which should contain a return code.

Exit Correlators

MAIEX02 has available to it a number of correlator areas, each one a fullword in length. These correlator fields can be used for any purpose. For example, they can contain counts or storage addresses. The exit can supply or change the content of any correlator supplied during any call.

System Correlator

One System Correlator exists in a system. It is supplied in all calls to MAIEX02. If any call updates it, that updated value is returned in all subsequent calls.

User Correlator

One User Correlator exists for each logon session. That is, when a user first logs on, that user is allocated a correlator containing hexadecimal zeroes. If an MAI session start, ACB open, or session end call updates the User Correlator, that updated value is returned in all subsequent session start, ACB OPEN and session end calls.

Session Correlator

When a user starts an MAI session, that session is allocated a correlator containing hexadecimal zeroes. If a session start or ACB open call updates the Session Correlator, that updated value is returned in subsequent calls for that session.

Security Exit Correlator

Session start, ACB open and session end calls are provided with the security exit correlator. This correlator is a user-level correlator that can be provided by the security exit.

Note: For more information, see the *Security Guide*.

Security Exit User Token

Session start, ACB open and session end calls are provided with the security exit user token. This is a user-level token that can be provided by the security exit. For more information, see the *Security Guide*.

Contents of the Communications Area

The exit has the following types of call, and the content of the communications area depends on the type of call:

- Exit initialization
- Exit termination
- MAI session start
- ACB open
- MAI session end

Exit Initialization Call

The Exit Initialization call is made when a SYSPARMS MAIEX02 command is entered to invoke the exit. The following parameters are contained in the communications area:

- Function code, F‘0’
- Address of the communications area
- ID of this system
- System Correlator
- A work area to be used for any purpose

Until the exit returns from an Initialization call, no MAI sessions are allowed.

Exit Termination Call

The Exit Termination call is made when your product region is about to terminate. The following parameters are contained in the communications area:

- Function code, F‘4’
- Address of the communications area
- ID of this system
- System Correlator
- A work area to be used for any purpose

MAI Session Start Call

The MAI Session Start call is made when a new MAI session is about to start. The following parameters are contained in the communications area:

- Function code, F‘8’
- Address of the communications area
- ID of this system
- Security Exit correlator
- User ID of user starting the session
- Node name of terminal from which session is being started
- Session ID of session being started
- Terminal’s screen sizes
- Flags to indicate whether the session is MAI-OC
- Language code of the user
- System Correlator

Items from this point onwards can be modified by the exit and the modified information will be used when the session is created:

- User Correlator
- User Security Token
- Session Correlator
- Any LU name chosen by the user
- MAI node name prefix as designated by a SYSPARMS MAIOPREF command
- The application with which the session will be started
- The LOGMODE name chosen by the user or MAI
- The length of any user data to be passed to the application at LOGON
- The user data itself
- An area into which the exit may place an error message if the session is to be refused
- A work area to be used for any purpose
- An indicator word, into which the exit places a value of F‘4’ if it requires an ACB open call
- The name of an NCL procedure to perform session script functions, and optional parameters to be passed to it

ACB Open Call

The ACB Open call is made after MAI has successfully opened or allocated the ACB to be used for the session. However, the call is only made if the exit returned the appropriate value in the indicator word after the Session Start call. The following parameters are contained in the communications area:

- Function code, F‘16’
- Address of the communications area
- ID of this system
- Security Exit correlator
- User ID of user starting the session
- Node name of terminal from which session is being started
- Session ID of session being started
- Flags to indicate whether the session is MAI-OC
- The MAI-FS privilege class of the user
- System Correlator
- User Correlator
- User Security Token
- Session Correlator
- Name of the ACB which will be used on this session
- Name of the application with which the session will be started
- A work area to be used for any purpose
- The length of any user data to be passed to the application at LOGON
- The user data

MAI Session End Call

The MAI Session End call is made when an MAI session has ended. The following parameters are contained in the communications area:

- Function code, F‘12’
- Address of the communications area
- ID of this system
- Security Exit correlator
- User ID of user on whose behalf session was started
- Node name of terminal from which session was started
- Application with which session was started
- Session ID of session ending
- Flags to indicate whether session is MAI-OC and whether any WAIT=PERM specification for the session is to be canceled
- System Correlator
- User Correlator
- User Security Token
- Session Correlator
- A work area to be used for any purpose
- The count of inbound and outbound bytes over the duration of the session
- The count of inbound and outbound RUs over the duration of the session

Return Codes from the Exit

When the exit returns to MAI-FS, Register 15 should contain a return code for the Exit Initialization call and the Session Start call.

Exit Initialization

Register 15 should contain zero if exit initialization was successful. A nonzero value in Register 15 indicates that initialization was not successful. In this case, no MAI sessions are allowed. Any attempts to start an MAI session are rejected with an appropriate error message.

Session Start

Register 15 should contain zero if the session should proceed using the parameters in the communications area. Any value other than zero indicates that the session will be refused and the message placed in the message field of the communications area displayed at the user's terminal. If this field is blank, the following default message is displayed:

```
SESSION REFUSED BY INSTALLATION EXIT
```

Appendix E: Consoles and Migration ID Exits

This section contains the following topics:

Console Use

For operators to be able to issue system commands from an Automation Services region, it is essential that you define suitable consoles to the system before starting the region. An Automation Services region can use JES or extended multiple console support (MCS) consoles in a z/OS environment, OP1 or OP2 consoles in an MSP environment, and pseudo consoles in a VOS3 environment.

JES, OP1, OP2, and Pseudo Consoles

JES, OP1, OP2, and pseudo consoles are virtual consoles. They can be acquired by any authorized program for use in issuing system and subsystem commands.

Extended MCS Consoles

In the z/OS environments, Automation Services can use extended MCS virtual consoles.

The advantages in using extended MCS consoles are:

- There is no theoretical limit to the number of extended MCS consoles in an z/OS configuration. JES consoles are limited to 99 across a sysplex.
- You can have a MASTER authority level.
- In a sysplex configuration, extended MCS consoles are more flexible.

Automation Services uses extended MCS consoles as follows:

- The eight-character name of consoles is constructed by using the convention specified in the CONSOLES parameter group, which is accessible through the /PARMS panel shortcut. The extended MCS console prefix is further prefixed with a Z and padded to five characters with Zs. The last three characters are a decimal number from 001 through 255. The region can use up to 254 extended MCS consoles.
- Console authority of MASTER can be set and honored.

Migration IDs

It is possible to assign a unique migration ID to an extended MCS console. The ID is required to issue commands to those applications that do not support named consoles. Across a sysplex, there is a limit of 150 migration IDs.

When a region issues commands internally by using an extended MCS console, it decides whether a migration ID is required through its migration ID determination exit. The exit requests an ID for all MODIFY and STOP system commands, and for any unrecognized commands.

When users issue commands in the region by using the SYSCMD command, they can choose whether a migration ID is required by using the MIGID operand of the SYSCMD command. If the MIGID operand is not specified, the setting specified in the CONSOLES parameter group is used. The default setting is YES, specifying that IDs be used.

The limit of 150 migration IDs may be a problem in a large sysplex where many applications are using extended MCS consoles. If a region cannot acquire a console when requested, the requesting SYSCMD command fails. Use the following suggestions to help you correct the problem:

- In the CONSOLES parameter group, change the value in the Acquire with Migration ID (default) field to NO.
- Consider writing your own migration ID determination exit to further restrict the use of IDs by internally issued commands. A sample exit, NMMIGIDX, is supplied with the product.

Console Management

A region uses the CONSOLES parameter group to specify its console requirements.

Automation Services uses consoles as follows:

- During region initialization, the CONSOLES parameter group sets a limit on the number of consoles available to authorized users in the region.
- Consoles are acquired and released as necessary.

Console Pool Management

The CONSOLES parameter group contains the following two values that govern how the region manages its pool of consoles:

- Maximum number of consoles that can be acquired concurrently by the region
- Maximum number of free consoles that should be retained in a pool for the region when the region finishes using them

Console Acquisition

When a user issues the SYSCMD command, the region tries to acquire a console as follows:

- It uses a console previously assigned to the user if the console has not timed out and if the console attributes match the new request.
- It searches the pool of consoles for a free console. If one is found, it is temporarily assigned to the environment that is issuing the command.
- If there are no free consoles and if the number of consoles currently acquired is less than the specified maximum, it tries to acquire one from the system.
- If the maximum number of consoles is already acquired, the acquisition fails. For commands issued internally, the region retries the acquisition as specified by the CONSOLES parameter group.

Console Release

When a console is not used any more, it is put in the pool. When the number of free consoles exceeds the value specified in the CONSOLES parameter group, the extra consoles are released back to the system.

Number of Consoles

Different products have different requirements for consoles. Some products have a peak in the number of consoles required at region startup. Allocate the appropriate number of consoles to handle the consumption peaks.

Note: Because more extended MCS consoles are available than JES consoles, use extended MCS consoles in preference to JES consoles when it is feasible.

Use the SHOW CONSOLES command to review console usage by the region.

Considerations

If a region requires a large number of consoles, then the larger the number of consoles retained, the more efficient the region becomes. However, retained consoles are not available to other applications.

Consider the following when specifying the Max Consoles to Retain value in the CONSOLES parameter group:

- The number of MSP OP1 and OP2 consoles is limited to 10 per system.
- The number of z/OS JES consoles is limited to 99 across a sysplex.
- It might be necessary to limit the number of consoles to retain if a significant number of extended MCS consoles require migration IDs.

Use of Migration ID Exits to Customize Console Management

When you are using Extended MCS (EXTMCS) consoles, not all software can handle a named console. Therefore, regions can request a migration ID (as a pseudo-console ID) for an EXTMCS console. Because migration IDs are limited to a pool of 150 across a sysplex, determine the need for a migration ID on a case-by-case basis.

Note: You can use the CONSOLES parameter group in Customizer to set the various console parameters.

How You Allow Dynamic Determination of the Need for Migration IDs

You can allow dynamic determination of the need for a migration ID as follows:

- By issuing a SYSCMD command with the MIGID operand set to MIGID=EXIT.

  Specifying this operand, with some command text, causes your region to invoke its internal migration ID determination exit. Optionally, your region can invoke a user-written exit that can override the internal exit decision.

- By using the NCL &AOMMIGID built-in function, in the format:

  ```
  &result = &AOMMIGID command-string
  ```

  The return value from the function is YES or NO, indicating whether the command needs a migration ID.

  Note: For more information about the &AOMMIGID built-in function, see the *Network Control Language Reference Guide*.

Note: The region always acts as if NO is specified under the following conditions:

- Console type does not support or need migration IDs.
- No consoles are acquired.

User Exits for Migration IDs

You can optionally define a user migration ID exit, which can examine and optionally override the decision made by the default exit.

Why Define a User Exit?

The default migration ID determination exit should normally be adequate. However, uses for a user exit include:

- Handling in-house subsystems that do not use a command recognition character (that can be set in the CONSOLES parameter group). This can involve parsing the command text.
- The migration ID determination exit sets the MIGID for unrecognized commands to YES. However, if the subsystem can handle named consoles, then the user exit can set NO for these subsystem commands.
- Overriding the standard settings for some z/OS commands.

Sample Exit

A sample exit, NMMIGIDX, is distributed in source form. It illustrates the coding required to produce a useful exit.

Activate the User Exit

To activate the user exit, specify an exit name in the CONSOLES parameter group in Customizer (enter **/PARMS**).

User Exit Requirements

The migration ID determination user exit must meet the following requirements:

- The exit must be assembled and link-edited into an accessible load library. Any name is suitable (the name is specified in the SYSPARMS command to activate the user exit).
- Because your product region executes in APF-authorized mode, the exit must be in an APF-authorized library.
- The exit must obey standard linkage conventions:
  - R1 contains the address of the parameter list.
  - R2 to R12 must be saved on entry and restored on exit.
  - R13 points to a standard save area.
  - R14 holds the return address and AMODE.
  - R15 holds the entry point address.
- The exit can be AMODE 24 or 31, and RMODE 24 or ANY. All parameters are passed below the 16M line. The exit is called in the link-edited AMODE. It returns using BSM 0,14 (with the value in R14 as at entry). However, BR 14 also works.
- The exit is called from the main task. It must not issue any operating system waits or use services that take a significant length of time. Doing so would severely impact processing.
- If the exit abends, it is disabled.

Input Parameters for User Exits

The migration ID exit is called with a parameter list.

Note: Although the exit is called in whatever AMODE it is linked with, all parameters are placed below 16 MB.

R1 points to a list of fullword addresses. These addresses in turn point to parameters. The format is as follows:

```
R1  ==> A(PARM1)
        A(PARM2)
        A(PARM3)
        A(PARM4)
        A(PARM5)
        A(PARM6+X'80000000')   (end of list)
```

PARM1

Function code. This is a fullword (DS F). The only value currently assigned is 0, meaning analyze the passed command.

PARM2

Four flag bytes. These are defined as follows:

Note: Only defined bits are shown here.

```
CMDFLAGS  DS   0XL4    FLAG BYTES
CMDFLAG1  DS   X       FLAG BYTE 1
CMD1RTPF  EQU  X'80'   1 - ROUTE CMD PREFIX DET'D
*                      (SKIPPED, REST EVALUATED)
CMD1MIGY  EQU  X'40'   1 - SOLVE SAYS NEED MIGID(0-NO)
CMDFLAG2  DS   X       FLAG BYTE 2
CMD2JES   EQU  X'80'   1 - APPARENT JES  CMD
CMD2SUBC  EQU  X'40'   1 - SUBSYS CMD (IN AOMSUBCM L)
CMD2MVSC  EQU  X'20'   1 - MVS CMD (IE FOUND IN TAB)
CMDFLAG3  DS   X       FLAG BYTE 3 (CMD INDS)
CMD3MDFY  EQU  X'80'   1 - MODIFY CMD
CMD3STOP  EQU  X'40'   1 - STOP   CMD
CMD3RPLY  EQU  X'20'   1 - REPLY  CMD (EXPL R ...)
CMD3SRPY  EQU  X'10'   1 - SHORT REPLY (#...)
CMDFLAG4  DS   X       FLAG BYTE 4
```

PARM3

Command buffer. This is a 128-byte buffer containing the command string, padded with blanks. There are no leading blanks, and at least one non-blank character. This is the complete command (uppercase).

PARM4

Length of the command. This is a fullword (DS F). It contains the non-blank length of the command text passed in PARM3. The value ranges from 1 to 126.

PARM5

Actual command buffer. This is the buffer (actually part of the buffer in PARM3) that contains the analyzed command.

Unless CMDFLAG1/CMD1RTPF is set, this is the same buffer (address) as PARM3.

If the route prefix flag is set, then this is the buffer (address) containing the routed command.

PARM6

Length of the actual command. This is a fullword (DS F). It contains the non-blank length of the command text passed in PARM5. The value ranges from 1 to 126.

Unless CMDFLAG1/CMD1RTPF is set, this is the same value as in PARM3.

If the route prefix flag (CMD1RTPF) is set, then this is the length of the routed command.

Note: Only one command buffer is used. If a ROUTE (RO) system command is detected, the second (actual) command buffer address is the address of the target command in the complete ROUTE command.

Return Codes from a User Migration ID Exit

A user migration ID exit informs your region of its decision by setting one of the following return codes (in R15):

0

No change to the MIGID setting that has been determined

4

Force MIGID=NO.

8

Force MIGID=YES.

No other return codes are defined, and any other return value is treated as RC=0.

Exit Tracing

You can trace migration ID exit processing (for either the default exit or a user exit) by using SYSPARMS AOMCOPTS=01. This causes a message (N86M01) to be written to the log for each request for analysis of a command (either by using SYSCMD MIGID=EXIT or by using the NCL built-in function).

The exit is not called if no consoles are acquired or if the current console type does not support migration IDs (only EXTMCS consoles support migration IDs).

How You Define Consoles to a CICS Region

You specify the number of consoles for a region to use in the Max Consoles to Acquire field of the CONSOLES parameter group. If you want to manage a CICS region, you define the required number of consoles to that region in the CICS Terminal Control Table (TCT):

- For JES consoles, the required minimum is the number specified in the Max Consoles to Acquire field.
- For extended MCS consoles, the required minimum is the number specified in the Max Consoles to Acquire field plus two.

Appendix F: Automation Services Application Program Interface

Note: This chapter applies to all products except CA SOLVE:FTS, and some products support only a subset of the APIs.

This section contains the following topics:

Application Programming Interface Procedures

The application program interface enables sources external to products that use Automation Services to call Automation Services functions, and retrieve information about resources and services.

The following API procedures are supplied for this purpose:

$RMCALL

Allows you to execute Automation Services commands, retrieve information about definitions in the knowledge base, retrieve resource and service status information, and delete extraneous link records.

$RMDBAPI

Allows you to maintain the ResourceView definitions and, in a CA NetMaster FTM region, file transfer rule sets and rules in the knowledge base.

$RMEVENT

Allows you to send a message to a (typically user-defined) resource or service.

$RMSTSET

Allows you to set the actual state of a defined resource or service.

$RECALL

Allows you to process EventView variables from NCL procedures.

$REDBAPI

Allows you to maintain the EventView definitions in the knowledge base.

The API can be called from:

- OCS or the system console
- Batch programs
- NCL procedures
- State change exits

Each of the APIs and their calling conventions are described in the following sections.

Note: *Services* are considered to be *a specific type of resource*—that is, a resource with a class of SVC.

$RMCALL API

The $RMCALL API procedure calls Automation Services from external sources.

This API procedure has the following general format:

```
$RMCALL OPT=SERVICE
        SERVICE=ACTION
        ACTION=[COMMAND | DBGET | PURGE | STGET]
       [ACBNAME=acb-name]
       [NAME=resource-name]
       [CLASS=cc]
       [SYSNAME=system-name]
       [VERSION=version]
       [COMMAND=command-name]
       [SYNC={YES | NO | NOTIFY}]
       [NCLID=ncl-id]
       [PARMS={'parm1=value1 parm2=value2 parm3=value3 ...'}]
```

You must specify the OPT=SERVICE and SERVICE=ACTION operands as shown. The ACTION operand is used to specify the function that the procedure performs. The remaining operands may be optional depending on the function being performed. Operands for each function are discussed in the section that describes the function.

If you code multiple values for an operand (for example, the PARMS operand), separate the parameters with spaces and enclose them in quotation marks.

More information:

$RMCALL ACTION=COMMAND (see page 321)
$RMCALL ACTION=DBGET (see page 326)
$RMCALL ACTION=PURGE (see page 328)
$RMCALL ACTION=STGET (see page 329)

$RMDBAPI API

The $RMDBAPI API procedure maintains ResourceView definitions from external sources. The procedure does not support:

- Shared and sysplex system image definitions
- Sysplex class resource definitions
- CA NetMaster NM for SNA and CA NetMaster NM for TCP/IP resource details

This API procedure has the following general format:

```
$RMDBAPI SERVICE={ACTIVATE|INACTIVATE|CREATE|DELETE|GET|LIST|SET}
         [TRUNCATE={YES|NO}]
        [{NAME=resource-name[MANNAME=manager-name]}|
         {RSNAME=ft-ruleset-name[RMNAME=ft-rule-name]}]
          CLASS=cc
         [SYSNAME=system-name]
         [VERSION=version]
         [field-name-1=field value-1]
         [field-name-2=field value-2]
         …
         [field-name-n=field value-n]
```

The SERVICE operand is used to specify the function that the procedure performs. The remaining operands may be optional depending on the function being performed. Operands for each function are discussed in the section that describes the function.

More information:

$RMDBAPI SERVICE=CREATE (see page 331)
$RMDBAPI SERVICE=DELETE (see page 343)
$RMDBAPI SERVICE=GET (see page 345)
$RMDBAPI SERVICE=LIST (see page 348)
$RMDBAPI SERVICE=SET (see page 350)

$RMEVENT API

The $RMEVENT API procedure sends a message to a defined resource from external sources.

This API procedure has the following general format:

```
$RMEVENT CLASS={USRCLS|class-name}
         NAME=resource-name
         MSG='message-text'
```

More information:

$RMEVENT (see page 352)

$RMSTSET API

The $RMSTSET API procedure sets the actual state of a defined resource from external sources.

This API procedure has the following general format:

```
$RMSTSET CLASS={USRCLS|class-name}
         NAME=resource-name
         STATUS=actual-state
```

More information:

$RMSTSET (see page 354)

$RECALL API

The $RECALL API procedure maintains EventView variables and control rule sets from external sources.

This API procedure has the following general format:

```
$RECALL SERVICE={ACTION|GET|SET}
        [ACTION={ACT|INACT}]
        [CLASS=VARIABLE]
         NAME={'RULESET=rulesetname'|'VARNAME=variable-name'}
        [PARMS='VALUE=new-value']
        [DESC=value-description]
```

The SERVICE operand is used to specify the function that the procedure performs. The remaining operands may be optional depending on the function being performed. Operands for each function are discussed in the section that describes the function.

More information:

$RECALL SERVICE=SET (see page 355)
$RECALL SERVICE=GET (see page 357)
$RECALL SERVICE=ACTION (see page 360)

$REDBAPI API

The $REDBAPI API procedure maintains EventView rule set and message rule definitions from external sources.

This API procedure has the following general format:

```
$REDBAPI SERVICE={CREATE|DELETE|GET|LIST}
         [TRUNCATE={YES|NO}]
         [NAME=rule-object-name]
          CLASS=cc
         [RULESET=ruleset-name]
         [RULEID=message-rule-id]
         [field-name-1=field value-1]
         [field-name-2=field value-2]
         …
         [field-name-n=field value-n]
```

The SERVICE operand is used to specify the function that the procedure performs. The remaining operands may be optional depending on the function being performed. Operands for each function are discussed in the section that describes the function.

More information:

$REDBAPI SERVICE=CREATE (see page 361)
$REDBAPI SERVICE=DELETE (see page 368)
$REDBAPI SERVICE=GET (see page 371)
$REDBAPI SERVICE=LIST (see page 373)

$RMCALL ACTION=COMMAND

This API procedure function call executes Automation Services commands.

Syntax

This API procedure function call has the following format:

```
$RMCALL OPT=SERVICE
        SERVICE=ACTION
        ACTION=COMMAND
       [NAME=resource-name]
       [CLASS=cc]
       [SYSNAME=system-name]
       [VERSION=version]
        COMMAND=command-name
        SYNC={YES|NO|NOTIFY}
       [NCLID=ncl-id]
       [PARMS={'parm1=value1 parm2=value2 parm3=value3...'}]
```

Operands

This API procedure function call has the following operands:

OPT=SERVICE

Specifies that an API service is to be performed.

SERVICE=ACTION

Specifies that an ACTION service is to be performed.

ACTION=COMMAND

Specifies that a command is to be processed.

Note: The operands, NAME, CLASS, SYSNAME, and VERSION, are included as operands in the API for the purpose of backward compatibility. Commands usually set these values, or prompt users for the values, depending on how the command is defined. If you do need to set these values (for example, you want to execute the command programmatically) set them through the PARMS operand. The values specified in the PARMS operand override the default values supplied by other operands.

NAME=*resource-name*

Specifies the name of the resource to which the command applies.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image where the command is executed.

VERSION=*version*

Specifies the version of the system image where the command is executed.

COMMAND=*command-name*

Specifies the name of the command to be executed.

SYNC={YES|NO|NOTIFY}

Specifies how the command is to be executed. The following values can be specified:

YES

Specifies that the command is executed synchronously. &RETCODE and &SYSMSG values are returned to the calling procedure.

NO

Specifies that the command is executed asynchronously. Results are not returned to the caller.

NOTIFY

Specifies that the command is executed as for SYNC=NO but &SYSMSG values are returned to the caller's request queue in the form of $$$MSG$$$ *message-text,* where *message-text* is the contents of &SYSMSG.

NCLID=*ncl-id*

(SYNC=NOTIFY) Specifies an NCL ID so that the value of &SYSMSG can be returned to the appropriate request queue.

PARMS={'*parm1=value1 parm2=value2 parm3=value3 ...*'}

Specifies parameters for the command. Delimit the parameters with spaces. If you specify more than one parameter you need to enclose the parameter list in quotation marks. The following parameters can be set when executing a command (see the previous note):

NAME=*resource-name*

Specifies the name of the resource to which the command applies.

CLASS=*cc*

Specifies the two-digit identifier of the class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image where the command is executed.

VERSION=*version*

Specifies the version of the system image where the command is executed.

Some commands require other parameters (see page 324).

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Execute the CHECKALL Command

This example executes the CHECKALL command on the local system:

```
&CALL PROC=$RMCALL +
      PARMS=(OPT=SERVICE,+
             SERVICE=ACTION,+
             ACTION=COMMAND,+
             COMMAND=CHECKALL)
```

Example: Execute the ASA Command

This example executes the ASA command against the printer (class 11) named RES001, located on version 0001 of the EASTPRD system:

```
&CALL PROC=$RMCALL +
      PARMS=(OPT=SERVICE,+
             SERVICE=ACTION,+
             ACTION=COMMAND,+
             COMMAND=ASA,+
             PARMS='SYSNAME=EASTPRD VERSION=0001 CLASS=11 NAME=RES001')
```

Supplied Commands That Require Parameters

Two commands, GLOBAL and LOAD, require parameters when they are executed programmatically.

GLOBAL Command Parameter

The GLOBAL command has the following parameter:

MODE={MANUAL|AUTOMATED}

Specifies whether the defined services and resources are to be controlled automatically or manually.

Note: If you specify AUTOMATED, resources and services that have MANUAL or IGNORED specified in their definitions are still controlled manually. If you specify MANUAL, then *all* elements are controlled manually.

LOAD Command Parameters

The LOAD command has the following parameters:

NEWSYS=*system-name*

Specifies the name of the new system image.

NEWVERS=*version*

Specifies the version of the new system image.

MODE={MANUAL|AUTOMATED}

Specifies the global mode, as documented for the GLOBAL command.

WARM={YES|NO}

Specifies whether a warm load or a cold load is to be performed.

$RMCALL ACTION=DBGET

This API procedure function call retrieves information about a resource from the knowledge base.

If you make this call from an NCL procedure, ensure that you share the &ZRMDB-prefixed variables, for example, by adding the following statement before the call:

```
&CONTROL SHRVARS=(ZRMDB)
```

Syntax

This API procedure function call has the following format:

```
$RMCALL OPT=SERVICE
        SERVICE=ACTION
        ACTION=DBGET
        NAME=resource-name
        CLASS=cc
        SYSNAME=system-name
        VERSION=version
```

Operands

This API procedure function call has the following operands:

OPT=SERVICE

Specifies that an API service is to be performed.

SERVICE=ACTION

Specifies that an ACTION service is to be performed.

ACTION=DBGET

Specifies that database information about a resource is to be retrieved.

NAME=*resource-name*

Specifies the name of the resource for which information is to be retrieved.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image where the resource is defined.

VERSION=*version*

Specifies the version of the system image where the resource is defined.

Return Variables

This API procedure function call returns the following variables:

&SYSMSG

Contains the returned message.

&ZRMDB* (see page 406)

Contain the returned definition information about the specified resource.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Retrieve Information About an Internal Resource

This example retrieves information about the internal resource (class 21) named RES001, located on version 0001 of the EASTPRD1 system:

```
&CALL PROC=$RMCALL +
      SHARE=(ZRMDB>) +
      PARMS=(OPT=SERVICE,+
             SERVICE=ACTION,+
             ACTION=DBGET,+
             NAME=RES001,+
             CLASS=21,+
             SYSNAME=EASTPRD1,+
             VERSION=0001)
```

More information:

$RMDBAPI SERVICE=GET (see page 345)

$RMCALL ACTION=PURGE

This API procedure function call deletes extraneous link records. When a linked region is decommissioned without first unlinking it, extraneous link records are left behind in other regions that were connected to it.

Syntax

This API procedure function call has the following format:

```
$RMCALL OPT=SERVICE
        SERVICE=ACTION
        ACTION=PURGE
        ACBNAME=acb-name
```

Operand

This API procedure function call has the following operand:

ACBNAME=*acb-name*

Specifies the ACB name that identifies the link record.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Delete a Link Record

This example deletes the SOLV1 link record:

```
&CALL PROC=$RMCALL +
      PARMS=(OPT=SERVICE,+
```

```
SERVICE=ACTION,+
ACTION=PURGE,+
ACBNAME=SOLV1)
```

$RMCALL ACTION=STGET

This API procedure function call retrieves information about the current status of a resource.

If you make this call from an NCL procedure, ensure that you share the &ZRMST-prefixed variables, for example, by adding the following statement before the call:

```
&CONTROL SHRVARS=(ZRMST)
```

Syntax

This API procedure function call has the following format:

```
$RMCALL OPT=SERVICE
        SERVICE=ACTION
        ACTION=STGET
        NAME=resource-name
        CLASS=cc
        SYSNAME=system-name
        VERSION=version
```

Operands

This API procedure function call has the following operands:

OPT=SERVICE

Specifies that an API service is to be performed.

SERVICE=ACTION

Specifies that an ACTION service is to be performed.

ACTION=STGET

Specifies that status information about a resource is to be retrieved.

NAME=*resource-name*

Specifies the name of the resource for which status information is to be retrieved.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image where the resource is defined.

VERSION=*version*

Specifies the version of the system image where the resource is defined.

Return Variables

This API procedure function call returns the following variables:

&SYSMSG

Contains the returned message.

&ZRMST* (see page 410)

Contain the returned status information about the specified resource.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Retrieve Status of an Internal Resource

This example retrieves status information about the internal resource (class 21) named RES001, located on version 0001 of the EASTPRD1 system:

```
&CALL PROC=$RMCALL +
      SHARE=(ZRMST>) +
      PARMS=(OPT=SERVICE,+
             SERVICE=ACTION,+
             ACTION=STGET,+
             NAME=RES001,+
             CLASS=21,+
             SYSNAME=EASTPRD1,+
             VERSION=0001)
```

$RMDBAPI SERVICE=CREATE

This API procedure function call creates a ResourceView definition in the knowledge base.

Syntax

This API procedure function call has the following format:

```
$RMDBAPI SERVICE=CREATE
        [TRUNCATE={YES|NO}]
       [{NAME=resource-name[MANNAME=manager-name]}|
        {RSNAME=ft-ruleset-name[RMNAME=ft-rule-name]}]
         CLASS=cc
         SYSNAME=system-name
         VERSION=version
        [field-name-1=field value-1]
        [field-name-2=field value-2]
        …
        [field-name-n=field value-n]
```

Operands

Notes:

- Operand values must not contain the question mark (?) character.
- If possible, do not use the semi-colon (;) in values. By default, a semi-colon is interpreted as a command separator if the API is executed (EXEC) or started (START).
- If you must use the semi-colon and you are calling the API from an NCL procedure, use the &CALL verb.

This API procedure function call has the following operands:

SERVICE=CREATE

Specifies that you want to create a definition in the knowledge base.

TRUNCATE={YES|NO}

Specifies whether a field value is truncated if it is longer than the field length.

YES

Specifies that long values are truncated and the definition is created in the knowledge base.

NO

Specifies that no truncation is allowed. If a long value is encountered, the definition is not created in the knowledge base.

NAME=*resource-name*

Specifies the name of the resource definition to create (for example, the address of a DASD or the name of a started task).

This operand is not required if you are creating a system image, a file transfer rule set, or a file transfer rule definition.

MANNAME=*manager-name*

(CA NetMaster FTM) Specifies the name of the manager that owns the resource, *resource-name* (for example, the definition of the file transfer manager that owns the monitor resource whose definition you want to create).

RSNAME=*ft-ruleset-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule set to which the specified rule, *ft-rule-name*, belongs.

RMNAME=*ft-rule-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule definition to create.

This operand is not required if you are creating a file transfer rule set definition.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image to create or the name of the system image in which to create the specified resource.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the value of SYSNAME is FILTER.

VERSION=*version*

Specifies the version of the system image.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the values of VERSION are 0006 and 0005, respectively.

field-name-n=field-value-n

Specifies the values of the fields in the definition.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

4

Indicates that processing was successful, but truncation has occurred.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Define a System Image

This example creates an EASTPRD1 version 2 system image definition (class 1), with truncation allowed:

```
&SDESC=&STR Eastern production system
```

```
&CALL PROC=$RMDBAPI +
      PARMS=(SERVICE=CREATE,+
             CLASS=01,+
             SYSNAME=EASTPRD1,+
             VERSION=0002,+
             SDESC=&SDESC)
```

More information:

System Image Fields (see page 335)
Resource Fields (see page 336)

How You Specify Field Values When Calling $RMDBAPI from an NCL Procedure

If you are calling from an NCL procedure, consider the following:

- You can add the following statement before the call to share the field values:

  ```
  &CONTROL SHRVARS=(ZRMDB)
  ```

  Specify each value in ZRMDB*field-name-n*. In this case, you do not need to specify the field name operands. You can, however, override the specified variable values by using the operands.

  Note: If you share field values, the API ignores misspelled field names. If you misspell a name, the intended value is not set.

- You can use the following statement to preserve case-sensitive field values:

  ```
  &CONTROL NOUCASE
  ```

- If you use the operands to pass the values, beware of the following:
  - The maximum length of an &CALL or EXEC statement is 2048 characters.
  - Do *not* enclose values in quotes. Use variables to assign strings.
  - If a value contains blanks, then for an EXEC statement, use &CONTROL NOVARSEG and pass the value as a variable, for example:

    ```
    &CONTROL NOVARSEG
    &DCMD=&STR D J,STC1
    EXEC $RMDBAPI SERVICE=CREATE … DISPCMD=&DCMD …
    ```

How You Specify Field Values When Submitting $RMDBAPI as a Command

If a value contains blanks, enclose the value in quotes.

ResourceView Definition Field Names

The following sections list the field names for ResourceView definitions. For more information, see the product guides for any product specific field names not included here.

The names are related to the corresponding field labels on the appropriate definition panels:

- Fields that are mandatory on a panel are mandatory in the API.
- Values that are valid in the panel fields are valid in the API.
- Fields that have default values inherit the values in the API.

System Image Fields

This table lists the system image field names that can be used in the $RMDBAPI procedure.

Field Names	Field Label on Panel
System Image Definition	
HOMESYS	Home System
SDESC	Short Description
LDESC1 to LDESC4	Long Description
RULEID	EventView Ruleset to Activate

Resource Fields

The following table lists the resource field names that can be used in the $RMDBAPI procedure.

Field Names	Field Label on Panel
General Description	
TYPE	Type
OWNRNME	CICS Region Name (classes 4 to 7)
OWNRCLS	CICS Region Class (classes 4 to 7)
REMONME	Remote Region Name (class 7)
REMOCLS	Class (class 7)
REMOSMF	SMFID (class 7)
CRFILT	Containment Filter
LUNAME	LU Name (classes 11 and 14)
VOLUME	Volume (class 16)
ACBNAME	ACB Name
MODE	Operation Mode
SDESC	Short Description
LDESC1 to LDESC4	Long Description
TEMPLAT	TemplateName
TMPLACT	Template action code (M, O, or R)
Availability Map	
SCHED	Map Name

Field Names	Field Label on Panel
Group Filters (NA)	
RESNM1 to RESNM97	Resource Name
RESTP1 to RESTP97	Resource Type
FLTNM1 to FLTNM97	Filter Name
WGHT1 to WGHT97	Weight
WGHTT1 to WGHTT97	Weight Type
State Thresholds (NA)	
UNKTHR	UNKNOWN
FAILTHR	FAILED
DEGDTHR	DEGRADED
STOPTHR	STOPPING
INACTHR	INACTIVE
STRTTHR	STARTING
ACTTHR	ACTIVE
NOKTHR	Not OK
Activation Details	
INITCMD	System Command
INIMSGT	Expected Activation Completion Message
IN*x* (for example, INWILD)	See the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table
INIPNAM	ProcessName
INIPRC1 to INIPRC2	Optional Parameters
INITIME	Timeout After
INITMST	On Timeout Assume Status of

Field Names	Field Label on Panel
Restart Control Parameters	
RETRYLM	Retry Attempt Limit
RETRYTM	Retry Time Limit
RETRYCM	System Command
RETRYPR	ProcessName
RETRYP1 to RETRYP2	Optional Parameters
Inactivation Details	
TRMTCMD	System Command
TRMMSGT	Expected Inactivation Completion Message
TR*x*	See the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table
TRMPNAM	ProcessName
TRMPRC1 to TRMPRC2	Optional Parameters
TRMTIME	Timeout After
TRMTMST	On Timeout Assume Status of
TRMFRET	Try Force Inactivation
Force Inactivation Details	
FTRMCMD	System Command
FTRMSGT	Expected Force Inactivation Completion Message
FT*x*	See the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table
FTRPNAM	ProcessName
FTRMPR1 to FTRMPR2	Optional Parameters
FTRTIME	Timeout After
FTRTMST	On Timeout Assume Status of

Field Names	Field Label on Panel
Display and Heartbeat Details	
DISPCMD	System Command
HBEATIN	Heartbeat Interval
ACTMSG	Message Text (ACTIVE status)
DA*x*	For ACTIVE status (see the field names for the panels Define Extended Filter Definitions to Define Event Documentation in this table)
INACMSG	Message Text (INACTIVE status)
DI*x*	For INACTIVE status (see the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table)
STRTMSG	Message Text (STARTING status)
DS*x*	For STARTING status (see the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table)
STOPMSG	Message Text (STOPPING status)
DP*x*	For STOPPING status (see the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table)
DEGDMSG	Message Text (DEGRADED status)
DD*x*	For DEGRADED status (see the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table)
FAILMSG	Message Text (FAILED status)
DF*x*	For FAILED status (see the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table)
UNKMSG	Message Text (UNKNOWN status)
DU*x*	For UNKNOWN status (see the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table)
DISPNAM	ProcessName
DISPRC1	Optional Parameters

Field Names	Field Label on Panel
Status Monitor Message Details	
MONMT01 to MONMT97	Messages
M01*x* to M97*x*	See the field names for the panels from Define Extended Filter Definitions to Define Event Documentation in this table
MONPR01 to MONPR97	Pty (specifies the priority of the message rule, which is used to determine which rule to use when a received message satisfies more than one rule)
MONST01 to MONST97	Status
State Change Exits	
SBAPROC	Process (before activation)
SBAPRM1 and SBAPRM2	Parameters (before activation)
STYPE1 to STYPE12	State Type
SFROM1 to SFROM12	Change From
STO1 to STO12	Change To
SPROC1 to SPROC12	Process
SPRM11 to SPRM112 SPRM21 to SPRM212	Parameters (first line) Parameters (second line)
Automation Log Details	
LOGTSIZ	Log Table Size
LOGAUTO	Log to Automation Log
LOGMVSC	Log to Console
LOGOCS	Log to OCS Window
LOGSYS	Log All System Msgs
LOGAUDT	Log Internal Audit Trail

Field Names	Field Label on Panel
Owner Details	
OWNNME1 and OWNNME2	Name
OWNUID1 and OWNUID2	Userid
OWNGRP1 and OWNGRP2	Group
OWNPHB1 and OWNPHB2	Phone Business Hours
OWNPHA1 and OWNPHA2	Phone After Hours
OWNPGR1 and OWNPGR2	Pager Number
Extended Function Exit	
FUNCNAM	Function Name
PARM1 to PARM12	Parameters
Define Extended Filter Definitions	
*x*WILD (for example, INWILD)	Wildcard Character
*x*SP1 to *x*SP5	Strt Pos
*x*WN1 to *x*WN5	Word Num
*x*OP1 to *x*OP5	Opr
*x*SC1 to *x*SC5	Scan Text
*x*EXP1 to *x*EXP5 (combined)	strt-pos,word-num,opr,scan-text
*x*RID	Expression
Define Event Related Actions	
*x*MOD	Mode
*x*ICMD	System Command
*x*RPLY	Reply (if WTOR)
*x*GALT	Generate Rsc Event

Field Names	Field Label on Panel
*x*LTXT	Log Message
*x*XPNM	ProcessName
*x*XPR1 and *x*XPR2	Optional Parameters
Define Event Exits	
*x*STXP	Process (State Change)
*x*STX1 and *x*STX2	Parameters (State Change)
*x*PRXP	Process (Problem)
*x*PRX1 and *x*PRX2	Parameters (Problem)
*x*GEXP	Process (General)
*x*GEX1 and *x*GEX2	Parameters (General)
Define Extended Display Attribute	
*x*EVDS	Extended Display (EXTDISP)
*x*INTN	Intensity
*x*COLR	Color
*x*HLIT	Highlight
*x*ICON	Use on Graphic Monitor?
*x*SEV	Severity
*x*FKWD	Keyword Value
*x*KWD1 to *x*KWD6	Var
*x*VAL1 to *x*VAL6	Value
Define Event Documentation	
*x*TMSG	Target Message
*x*NT1 to *x*NT12	Notes

$RMDBAPI SERVICE=DELETE

This API procedure function call deletes a ResourceView definition from the knowledge base.

Syntax

This API procedure function call has the following format:

```
$RMDBAPI SERVICE=DELETE
        [{NAME=resource-name[MANNAME=manager-name]}|
         {RSNAME=ft-ruleset-name[RMNAME=ft-rule-name]}]
          CLASS=cc
          SYSNAME=system-name
          VERSION=version
```

Operands

This API procedure function call has the following operands:

SERVICE=DELETE

Specifies that a definition is to be deleted from the knowledge base.

NAME=*resource-name*

Specifies the name of the resource definition to be deleted.

You cannot delete a resource that owns dependent resources (for example, a CICS started task that owns CICS resources).

This operand is not required if you are deleting a system image, a file transfer rule set, or a file transfer rule.

MANNAME=*manager-name*

(CA NetMaster FTM) Specifies the name of the manager that owns the resource, *resource-name* (for example, the definition of the file transfer manager that owns the monitor resource whose definition is to be deleted).

RSNAME=*ft-ruleset-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule set to be deleted or the name of the file transfer rule set from which the specified rule, *ft-rule-name*, is to be deleted.

You cannot delete an active rule set.

Note: When you delete a file transfer rule set, you also delete the rules it owns.

RMNAME=*ft-rule-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule definition to be deleted.

This operand is not required if you are deleting a file transfer rule set.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image to be deleted or the name of the system image from which the specified resource is to be deleted.

Notes:

- When you delete a system image, you also delete the resources it owns.
- For file transfer rule sets and rules in a CA NetMaster FTM region, the value of SYSNAME is FILTER.

VERSION=*version*

Specifies the version of the system image.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the values of VERSION are 0006 and 0005, respectively.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Delete the Resource Definition for a Printer

This example deletes the RES001 printer definition (class 11) from the EASTPRD1 version 1 system image:

```
&CALL PROC=$RMDBAPI +
      PARMS=(SERVICE=DELETE,+
             NAME=RES001,+
             CLASS=11,+
             SYSNAME=EASTPRD1,+
             VERSION=0001)
```

$RMDBAPI SERVICE=GET

This API procedure function call retrieves information about a definition in the knowledge base.

If you make this call from an NCL procedure, ensure that you share the &ZRMDB-prefixed variables, for example, by adding the following statement before the call:

```
&CONTROL SHRVARS=(ZRMDB)
```

Syntax

This API procedure function call has the following format:

```
$RMDBAPI SERVICE=GET
       [{NAME=resource-name[MANNAME=manager-name]}|
        {RSNAME=ft-ruleset-name[RMNAME=ft-rule-name]}]
         CLASS=cc
         SYSNAME=system-name
         VERSION=version
```

Operands

This API procedure function call has the following operands:

SERVICE=GET

Specifies that information about a definition is to be retrieved from the knowledge base.

NAME=*resource-name*

Specifies the name of the resource definition for which information is to be retrieved.

This operand is not required if you are retrieving information about a system image definition, a file transfer rule set, or a file transfer rule.

MANNAME=*manager-name*

(CA NetMaster FTM) Specifies the name of the manager that owns the resource, *resource-name* (for example, the definition of the file transfer manager that owns the monitor resource for which information is to be retrieved).

RSNAME=*ft-ruleset-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule set to which the specified rule, *ft-rule-name*, belongs.

RMNAME=*ft-rule-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule definition for which information is to be retrieved.

This operand is not required if you are retrieving information about a file transfer rule set definition.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image for which information is to be retrieved or the name of the system image that owns the resource for which information is to be retrieved.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the value of SYSNAME is FILTER.

VERSION=*version*

Specifies the version of the system image.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the values of VERSION are 0006 and 0005, respectively.

Return Variables

This API procedure function call returns the following variables:

&SYSMSG

Contains the returned message.

&ZRMDB*field-name*

Contain the returned knowledge base information about the specified resource.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Retrieve Information About an Internal Resource

This example retrieves information about the RES001 internal resource (class 21), located on the EASTPRD1 version 1 system image:

```
&CALL PROC=$RMDBAPI +
      SHARE=(ZRMDB>) +
      PARMS=(SERVICE=GET,+
             NAME=RES001,+
             CLASS=21,+
             SYSNAME=EASTPRD1,+
             VERSION=0001)
```

More information:

ResourceView Definition Field Names (see page 335)

$RMDBAPI SERVICE=LIST

This API procedure function call lists definitions in the knowledge base.

If you make this call from an NCL procedure, ensure that you share the &ZRMLST-prefixed variables, for example, by adding the following statement before the call:

```
&CONTROL SHRVARS=(ZRMLST)
```

Syntax

This API procedure function call has the following format:

```
$RMDBAPI SERVICE=LIST
        [RSNAME=ft-ruleset-name]
         CLASS=cc
        [SYSNAME=system-name]
        [VERSION=version]
```

Operands

This API procedure function call has the following operands:

SERVICE=LIST

Specifies that selected definitions in the knowledge base are to be listed in &ZRMLST*nnnn* variables.

RSNAME=*ft-ruleset-name*

(CA NetMaster FTM) Specifies the name of the file transfer rule set that owns the rules to be listed.

If you want to list the rule sets, do not specify this operand.

CLASS=*cc*

Specifies the two-digit identifier of the ResourceView definition class to which the resource belongs.

SYSNAME=*system-name*

Specifies the name of the system image that owns the resource definitions to be listed.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the value of SYSNAME is FILTER.

VERSION=*version*

Specifies the version of the system image.

Note: For file transfer rule sets and rules in a CA NetMaster FTM region, the values of VERSION are 0006 and 0005, respectively.

Return Variables

This API procedure function call returns the following variables:

&SYSMSG

Contains the returned message.

&ZRMLST*nnnn*

Contain the returned knowledge base definition entries.

Return Codes

The following return codes indicate the success or failure of the list processing:

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: List the Versions of a System Image

This example retrieves the list of all versions of the EASTPRD1 system image:

```
&CALL PROC=$RMDBAPI +
      SHARE=(ZRMLST>) +
      PARMS=(SERVICE=LIST,+
             CLASS=01,+
             SYSNAME=EASTPRD1)
```

$RMDBAPI SERVICE=SET

This API procedure function call changes field values in a system image definition. The SET function is not available to other definitions in the knowledge base.

Syntax

This API procedure function call has the following format:

```
$RMDBAPI SERVICE=SET
        [TRUNCATE={YES|NO}]
         CLASS=01
         SYSNAME=system-name
         VERSION=version
        [field-name-1=field value-1]
        [field-name-2=field value-2]
        …
        [field-name-n=field value-n]
```

Operands

This API procedure function call has the following operands:

SERVICE=SET

Specifies that you want to change the specified definition.

TRUNCATE={YES|NO}

Specifies whether a field value is truncated if it is longer than the field length.

YES

Specifies that long values are truncated and the definition is changed.

NO

Specifies that no truncation is allowed. If a long value is encountered, the definition is not changed.

CLASS=01

Specifies that you want to change a system image definition.

SYSNAME=*system-name*

Specifies the name of the system image definition to be changed.

VERSION=*version*

Specifies the version of the system image definition.

field-name-n=field-value-n

Specifies the values of the fields to be changed in the definition.

You cannot delete a field value.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

4

Indicates that processing was successful, but truncation has occurred.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Change the Long Description

This example changes the value of the fourth line of the Long Description field in the EASTPRD1 version 2 system image definition (class 1), with truncation allowed:

```
&LDESC4=&STR (Upgrade in progress)

&CALL PROC=$RMDBAPI +
      PARMS=(SERVICE=SET,+
             CLASS=01,+
             SYSNAME=EASTPRD1,+
             VERSION=0002,+
             LDESC4=&LDESC4)
```

$RMEVENT

This API procedure sends a message to a defined resource. The resource definition must interpret the message and control the actual state of the resource. If necessary, relevant actions are invoked as part of this process. This procedure is typically used to control user-defined resources.

Syntax

This API procedure function call has the following format:

```
$RMEVENT CLASS={USRCLS|class-name}
         NAME=resource-name
         MSG='message-text'
```

Operands

This API procedure function call has the following operands:

CLASS={USRCLS|*class-name*}

Specifies the class of the resource that is the subject of the message.

Default: USRCLS that specifies a user-defined resource class

NAME=*resource-name*

Specifies the name of the resource that is the subject of the message.

MSG='*message-text*'

Specifies the text of the message that is sent to the resource. The message text must be enclosed in quotation marks.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Send Message to a Resource

This example sends a user-defined message (that is, a message defined in the USRCLS class) to the resource named MYRES01:

```
$RMEVENT NAME=MYRES01 MSG='RECOVER'
```

$RMSTSET

This API procedure sets the actual state of a defined resource.

Syntax

This API procedure function call has the following format:

```
$RMSTSET CLASS={USRCLS|class-name}
         NAME=resource-name
         STATUS=actual-state
```

Operands

This API procedure function call has the following operands:

CLASS={USRCLS|*class-name*}

Specifies the class of the resource that is the subject of the status change.

Default: USRCLS that specifies a user-defined resource class

NAME=*resource-name*

Specifies the resource that is the subject of the status change.

STATUS=*actual-state*

Specifies the actual state to which the resource is to be set.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Set Resource Actual State

This example sets the actual state of MYRES01 to FAILED:

```
$RMSTSET NAME=MYRES01 STATUS=FAILED
```

$RECALL SERVICE=SET

This API procedure function call sets the value of an EventView variable.

Syntax

This API procedure function call has the following format:

```
$RECALL SERVICE=SET
        CLASS=VARIABLE
        NAME='VARNAME=variable-name'
        PARMS='VALUE=new-value'
       [DESC=value-description]
```

Operands

This API procedure function call has the following operands:

SERVICE=SET

Specifies that a value is to be set.

CLASS=VARIABLE

Specifies that the value of an EventView variable is to be set.

NAME='VARNAME=*variable-name*'

Specifies the name of the EventView variable.

Limits: Up to eight characters long

PARMS='VALUE=*new-value*'

Specifies the new value to be set for the specified variable.

DESC=*value-description*

(Optional) Specifies a description for the value.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Set the Value of a Variable

This example sets the value of TEST:

```
&VALUE = &ZQUOTE Test's value at &TIME
&DESC = &ZQUOTE Why Test was changed
&PARMS = &ZQUOTE VALUE=&VALUE DESC=&DESC
&CALL PROC=$RECALL +
```

```
PARMS=(SERVICE=SET,+
       CLASS=VARIABLE,+
       NAME='VARNAME=TEST',+
       PARMS=&PARMS)
```

$RECALL SERVICE=GET

This API procedure function call retrieves the value of an EventView variable.

If you make this call from an NCL procedure, ensure that you share the &$REVAR-prefixed variables, for example, by adding the following statement before the call:

```
&CONTROL SHRVARS=($REVAR)
```

Syntax

This API procedure function call has the following format:

```
$RECALL SERVICE=GET
        CLASS=VARIABLE
        NAME='VARNAME=variable-name'
```

Operands

This API procedure function call has the following operands:

SERVICE=GET

Specifies that a value is to be retrieved.

CLASS=VARIABLE

Specifies that the value to get is the value of an EventView variable.

NAME='VARNAME=*variable-name*'

Specifies the name of the EventView variable.

Limits: Up to eight characters long

Return Variables

This API procedure function call returns the following variables:

&$REVARDESC

Contains a description of the value of the EventView variable.

&$REVARNAME

Contains the name of the EventView variable.

&$REVARSTATS

Contains the date, time, and the user ID of the user who last updated the value.

&$REVARVALUE

Contains the value of the EventView variable.

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Retrieve the Value of a Variable

The following example retrieves the value of TEST:

```
&CALL PROC=$RECALL SHARE=($RE>) +
      PARMS=(SERVICE=GET,+
             CLASS=VARIABLE,+
             NAME='VARNAME=TEST')
&WRITE ZREVTEMP=&$REVARVALUE
```

$RECALL SERVICE=ACTION

This API procedure function call activates or inactivates a rule set.

Syntax

This API procedure function call has the following format:

```
$RECALL SERVICE=ACTION
        ACTION={ACT|INACT}
        NAME='RULESET=rulesetname'
```

Operands

This API procedure function call has the following operands:

SERVICE=ACTION

Specifies that an action is to be performed on a rule set.

ACTION={ACT|INACT}

Specifies that the rule set is to be activated or inactivated.

NAME='RULESET=*rulesetname*'

Specifies the name of the rule set to be activated or inactivated.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Activate a Rule Set

This example activates rule set SET01:

```
$RECALL SERVICE=ACTION ACTION=ACT NAME='RULESET=SET01'
```

Example: Inactivate a Rule Set

This example inactivates rule set SET01:

```
$RECALL SERVICE=ACTION ACTION=INACT NAME='RULESET=SET01'
```

$REDBAPI SERVICE=CREATE

This API procedure function call creates an EventView rule set or message rule definition in the knowledge base.

Syntax

This API procedure function call has the following format:

```
$REDBAPI SERVICE=CREATE
        [TRUNCATE={YES|NO}]
         CLASS=cc
         RULESET=ruleset-name
        [field-name-1=field value-1]
        [field-name-2=field value-2]
        …
        [field-name-n=field value-n]
```

Operands

Important! If possible, do not use the semi-colon (;) in values. By default, a semi-colon is interpreted as a command separator if the API is executed (EXEC) or started (START). If you must use the semi-colon and you are calling the API from an NCL procedure, use the &CALL verb.

This API procedure function call has the following operands:

SERVICE=CREATE

Specifies that you want to create a definition in the knowledge base.

TRUNCATE={YES|NO}

Specifies whether a field value is truncated if it is longer than the field length.

YES

Specifies that long values are truncated and the definition is created in the knowledge base.

NO

Specifies that no truncation is allowed. If a long value is encountered, the definition is not created in the knowledge base.

CLASS=*cc*

Specifies the two-digit identifier of the EventView class to which the definition belongs.

93

Specifies the rule set class.

94

Specifies the message rule class.

RULESET=*ruleset-name*

Specifies the name of the rule set to be created or the name of the rule set in which to create a message rule.

field-name-n=field-value-n

Specifies the values of the fields in the definition.

Limits: A value must not contain the question mark (?) character.

Return Variables

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

&ZRENAME

Contains the name of a created message rule.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

4

Indicates that processing was successful, but truncation has occurred.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Define a Rule Set

This example creates the SUPP rule set definition (class 93), with truncation allowed:

```
&SDESC=&STR Suppression rules

&CALL PROC=$REDBAPI +
      PARMS=(SERVICE=CREATE,+
             CLASS=93,+
             RULESET=SUPP,+
             SDESC=&SDESC)
```

More information:

Rule Set Fields (see page 365)
Message Rule Fields (see page 365)

How You Specify Field Values When Calling $REDBAPI from an NCL Procedure

If you are calling from an NCL procedure, consider the following:

- You can add the following statement before the call to share the field values:

  ```
  &CONTROL SHRVARS=(ZRE)
  ```

  Specify each value in ZRE*field-name-n*. In this case, you do not need to specify the field name operands. You can, however, override the specified variable values by using the operands.

  Important! If you share field values, the API ignores misspelled field names. If you misspell a name, the intended value is not set.

- You can use the following statement to preserve case-sensitive field values:

  ```
  &CONTROL NOUCASE
  ```

- If you use the operands to pass the values, beware of the following:
  - The maximum length of an &CALL or EXEC statement is 2048 characters.
  - Do *not* enclose values in quotes. Use variables to assign strings.
  - If a value contains blanks, then for an EXEC statement, use &CONTROL NOVARSEG and pass the value as a variable, for example:

    ```
    &CONTROL NOVARSEG
    &DESC=&STR SUPPRESSION RULES
    EXEC $REDBAPI SERVICE=CREATE … SDESC=&DESC …
    ```

Specify Field Values When Submitting $REDBAPI as a Command

If a value contains blanks, enclose the value in quotes.

EventView Definition Field Names

The following sections list the field names for EventView rule sets and message rules.

The names are related to the corresponding field labels on the appropriate definition panels:

- Fields that are mandatory on a panel are mandatory in the API
- Values that are valid in the panel fields are valid in the API.
- Fields that have default values inherit the values in the API.

Rule Set Fields

This table lists the rule set field names that can be used in the $REDBAPI procedure.

Field Names	Field Label on Panel
Rule Set Description	
RULSTAT	Ruleset Status
SDESC	Short Description
RSDELIV	Default Message Delivery
RSMOD	Perform Message Modification?
RSACT	Perform Action?
RSLOG	Log Ruleset Activity?
RSSTAT	Collect Statistics?
RSLEARN	Learn New Messages?
Rule Set Comments	
COMMENT1 to COMMENT12	Comment Text

Message Rule Fields

This table lists the message rule field names that can be used in the $REDBAPI procedure.

Field Names	Field Label on Panel
Message Filter	
RULSTAT	Rule Status
SDESC	Short Description
TSTTXT	Message Text
JOBNAME	Job Name
EJOBTYPE	Job Type
RULEPRI	Rule Priority

Field Names	Field Label on Panel
BESTFIT	Execute if not Best Fit?
DAYMAP (*xxxxxxx*) or DAY1 to DAY7	On Days
TSTART1 to TSTART2	Range*n* Start
TEND1 to TEND2	Range*n* End
Extended Message Filter	
EWILDC	Wildcard Character
EDESCCD	Descriptor Code
EROUTCD	Route Code
EMSGID	Message ID
MVSSYS	System Name
ESTPOS1 to ESTPOS5	Strt Pos
EWORD1 to EWORD5	Word Num
EOPER1 to EOPER5	Opr
ETXT1 to ETXT5	Scan Text
EEXPR	Expression
Set Test Variables	
TSTVAR1 to TSTVAR6 (*name*=*value*) or TVAR1 and TVALUE1 to TVAR6 and TVALUE6	Name and Value
Message Delivery	
MDELIV	Deliver
THRSMAX	Maximum Number
THRSINT	Time Interval
THRSACT	Do Action
THRSCOR	Correlation Key
Message Modification	
MSGTXT	Replacement Text
MDESCCD	Set Descriptor Code

Field Names	Field Label on Panel
MROUTCD	Set Route Code
COLOR	Color
HLITE	Highlight
INTENS	Intensity
MON	Monitor?
ALARM	Alarm?
NRD	NRD?
MSGCODE	Message Code
Message Actions	
REPLTXT	Reply Text
SYSCMD	System Command
SOLVCMD	MS Command
SSOPROC (combined) or SSOPNAME and SSOPPRM	Process and Parameters
SSOCMD (combined) or SSOCNAME and SSOCPRM	Command and Parameters
Related Message Groups	
MGRPID1 to MGRPID5	Group Name
MCOR1 to MCOR5	Correlation Key
Set Variables	
SETVAR1 to SETVAR6 (*name*=*value*) or VAR1 and VALUE1 to VAR6 and VALUE6	Name and Value
Rule Comments	
COMMENT1 to COMMENT12	Comment Text

$REDBAPI SERVICE=DELETE

This API procedure function call deletes an EventView rule set or message rule definition from the knowledge base.

Syntax

This API procedure function call has the following format:

```
$REDBAPI SERVICE=DELETE
         [NAME=rule-object-name]
          CLASS=cc
          RULESET=ruleset-name
```

Operands

This API procedure function call has the following operands:

SERVICE=DELETE

Specifies that a definition is to be deleted from the knowledge base.

NAME=*rule-object-name*

Specifies the object name of the message rule definition to be deleted.

The name is contained in the &ZRENAME variable returned by a previous $REDBAPI SERVICE=CREATE call.

This operand is not required if you are deleting a rule set.

CLASS=*cc*

Specifies the two-digit identifier of the EventView class to which the definition belongs.

93

Specifies the rule set class.

94

Specifies the message rule class.

RULESET=*ruleset-name*

Specifies the name of the rule set to be deleted or the name of the rule set that owns the message rule is to be deleted.

When you delete a rule set, you also delete the rules it owns.

Return Variable

This API procedure function call returns the following variable:

&SYSMSG

Contains the returned message.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Delete a Rule Set

This example deletes the SUPP rule set (class 93):

```
&CALL PROC=$REDBAPI +
      PARMS=(SERVICE=DELETE,+
             CLASS=93,+
             RULESET=SUPP)
```

$REDBAPI SERVICE=GET

This API procedure function call retrieves information about an EventView rule set or message rule definition in the knowledge base.

If you make this call from an NCL procedure, ensure that you share the &ZRE-prefixed variables, for example, by adding the following statement before the call:

```
&CONTROL SHRVARS=(ZRE)
```

Syntax

This API procedure function call has the following format:

```
$REDBAPI SERVICE=GET
         [NAME=rule-object-name]
          CLASS=cc
          RULESET=ruleset-name
```

Operands

This API procedure function call has the following operands:

SERVICE=GET

Specifies that information about a definition is to be retrieved from the knowledge base.

NAME=*rule-object-name*

Specifies the object name of the message rule definition for which information is to be retrieved.

The name is contained in the &ZRENAME variable returned by a previous $REDBAPI SERVICE=CREATE call.

This operand is not required if you are retrieving information about a rule set definition.

CLASS=*cc*

Specifies the two-digit identifier of the EventView class to which the definition belongs.

93

Specifies the rule set class.

94

Specifies the message rule class.

RULESET=*ruleset-name*

Specifies the name of the rule set for which information is to be retrieved or the name of the rule set that owns the message rule for which information is to be retrieved.

Return Variables

This API procedure function call returns the following variables:

&SYSMSG

Contains the returned message.

&ZRE*field-name*

Contain the returned knowledge base information about the specified rule set or rule.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: Retrieve Information About a Message Rule

This example retrieves information about a message rule (class 94) previously created in the SUPP rule set:

```
&CALL PROC=$REDBAPI PARMS=(SERVICE=CREATE,…)
…
&JAA992I=&ZRENAME
…
&CALL PROC=$REDBAPI +
      SHARE=(ZRE>) +
      PARMS=(SERVICE=GET,+
            NAME=&JAA992I,+
            CLASS=94,+
            RULESET=SUPP)
```

More information:

EventView Definition Field Names (see page 364)

$REDBAPI SERVICE=LIST

This API procedure function call lists EventView rule set or message rule definitions in the knowledge base.

If you make this call from an NCL procedure, ensure that you add the following statement before the call:

```
&CONTROL SHRVARS=(ZRELST)
```

Syntax

This API procedure function call has the following format:

```
$REDBAPI SERVICE=LIST
         CLASS=cc
        [RULESET=ruleset-name]
        [RULEID=message-rule-id]
```

Operands

This API procedure function call has the following operands:

SERVICE=LIST

Specifies that selected definitions in the knowledge base are to be listed in &ZRELST*nnnn* variables.

CLASS=*cc*

Specifies the two-digit identifier of the EventView class to which the definition belongs.

93

Specifies the rule set class.

94

Specifies the message rule class.

RULESET=*ruleset-name*

Specifies the rule sets to be listed, or specifies the name of the rule set that owns the message rules to be listed.

If you are listing rule sets, the value is generic. For example, if RULESET=SUP, then rule sets with names that start with SUP are matched.

RULEID=*message-rule-id*

Specifies the IDs of the message rules to list.

The ID is the first word of the message text.

The value is generic. For example, if RULEID=JBB1, then message rules with a first word that starts with JBB1 are matched.

Return Variables

This API procedure function call returns the following variables:

&SYSMSG

Contains the returned message.

&ZRELST*nnnn*

Contain the returned knowledge base definition entries.

Return Codes

Return codes indicate the success or failure of processing. This API procedure function call returns the following return codes in the &RETCODE variable:

0

Indicates that processing was successful.

8

Indicates that processing failed.

16

Indicates that error occurred in the call syntax.

Example: List Rule Sets

This example retrieves the list of all rule sets:

```
&CALL PROC=$REDBAPI +
      SHARE=(ZRELST>) +
      PARMS=(SERVICE=LIST,+
             CLASS=93)
```

Appendix G: Audit Application Program Interface

This section contains the following topics:

Audit API

This product lets a programmatic interface generate your own site-specific AUDIT events. To invoke this AUDIT API, issue the $NMAUAPI command in NCL or from a command prompt.

The AUDIT parameter group enables the auditing of AUDIT events. The parameter group can be accessed by entering **/PARM** and selecting **U** to update the AUDIT parameter group and set the desired values for the event types you want to enable.

Calls to $NMAUAPI deliver AUDIT events based on the settings you have set in the AUDIT /PARM group. You can enable the AUDIT /PARM group events types to be generated as follows:

- SMF generates only SMF AUDIT events for that event type.
- LOG generates only activity log messages for that event type.
- BOTH generates SMF and LOG events.
- NO disables that event type from being generated.

Note: For information about how to enable auditing, see the *Administration Guide*.

The following Event Types are available for this API:

- Access (security-based) events, such as logon access to regions and applications, and access to functions under your control
- Application activity based on programs and systems you have developed or are monitoring and want to raise AUDIT-based events for
- Configuration Record Auditable activity that relates to resources and interfaces you have developed that have definition changes
- Procedural events for user activities such as issuing of commands to applications you have developed
- Serviceability events such as state changes of the applications you have developed
- Utilization events for statistics, which are usually based on counters your Audit API can create and increment at any time. The processing of these counters generates AUDIT events that record the accumulated counter values at the intervals specified by the /PARM Group Utilization settings.

  Alternatively, you can generate immediate utilization events based on calculations you have already done by using the OPT=RAISE-EVENT.

Your Audit API generates audit events in the local region and SMF. You can also use the API to pass the events to a linked region at the same time as the API call is being executed in the local region using the RMTSYS= parameter in the AUDIT API call.

The API provides two types of options: RAISE-EVENT and counter.

- The RAISE-EVENT API option lets you generate events immediately based on the parameters you specify in the API.
- The utilization counter option is based on the Utilization event type. These events are generated at predetermined intervals controlled by the /PARM AUDIT settings. The counters can be created and maintained by calls from $NMAUAPI and the associated counters incremented at any time. After the specified Utilization time interval has elapsed, the values stored in ALL AUDIT Utilization event type counters are written to the destination specified by the Utilization event.

If you want to raise utilization events for statistics that you are not already collecting, you can use the REGISTER-COUNTER and ADJUST-COUNTER API options to create counters and update their values to gather those statistics. At preset intervals (based on the settings in the AUDIT parameter group), each counter generates an audit event using the accumulated value.

Samples of API calls are provided in the *dsnpref*.OPB9.CC2DSAMP($NMAUSP1) data set member.

$NMAUAPI OPT=RAISE-EVENT—Raise Audit Events

The $NMAUAPI OPT=RAISE-EVENT API option raises events that can be used for auditing.

This API option has the following format:

```
$NMAUAPI [OPT=RAISE-EVENT]
         [TYPE=event_type]
          OBJCLASS=#class
          OBJNAME=object_name
         [OBJLOC=object_location]
         [OBJTEXT=object_text]
         [USER=user_name]
         [USERLOC=user_location]
          ACTION=action_type
         [TEXT=action_text]
         [VALUE=action_value]
         [PERIOD=event_statistics_interval]
         [RMTSYS=remote_regions]
         [TRACE={NO | YES}]
```

OPT=RAISE-EVENT

(Optional) Specifies that an event be raised for an activity that matches the other parameters.

TYPE=*event_type*

(Optional) Specifies the type of events to be raised.

Default: APPLICATION

Valid values: ACCESS, APPLICATION, CONFIGURATION, PROCEDURAL, SERVICEABILITY, and UTILIZATION (or UTILISATION)

Note: You use UTILIZATION when your application collects its own statistics. You can let the API collect statistics for you by using the counter options. If you use the counter options, the API will raise the events automatically and you do not have to use this RAISE-EVENT option.

OBJCLASS=#*class*

Specifies the class (user-defined) of the objects to be audited. The class name must start with # (for example, #CLASS01).

Limits: Eight characters, including #

OBJNAME=*object_name*

(Optional for UTILIZATION) Identifies the object for which the event is raised.

OBJLOC=*object_location*

(Optional) Specifies the ACB name of the region that owns the object.

Limits: Eight characters

OBJTEXT=*object_text*

(Optional) Specifies a description to further identify the object.

USER=*user_name*

(Optional) Specifies the ID of the user whose activity raised the event.

Default: ID of the user that calls the API

Limits: Eight characters

USERLOC=*user_location*

(Optional) Specifies the ACB name of the region in which the user whose activity raised the event is logged on.

Limits: Eight characters

ACTION=*action_type*

Specifies the performed action. The API provides the following predefined actions:

ACTION	ADD	CLOSE
COMMAND	COMPILE	CREATE
DELETE	ENHANCE	EXECUTE
ISSUE	LOAD	MODIFY
REPLY	RESET	SET
START	STATECHANGE	STOP
SUPPRESS	TRIGGER	UPDATE

In SMF, actions are represented in hexadecimal values (see page 401).

If you specify your own action, it will be recorded in SMF as X'FFFF' (USER-DEFINED) with the TEXT field as *action_type*:*action_text*. If you want to assign a specific hexadecimal ID to a user action not in the list, you can define it through Common Application Services (CAS) (see page 387).

Limits: 12 characters

TEXT=*action_text*

(Optional) Specifies additional information about the action.

Example: For events of the PROCEDURAL type, it can specify a command.

VALUE=*action_value*

(Mandatory when specifying TYPE=UTILIZATION) Specifies a number to qualify the action.

Limits: Integer

Example: For events of the UTILIZATION type, it can specify the number of suppressed system messages; for events of the PROCEDURAL type, it can specify the return code.

PERIOD=*event_statistics_interval*

(UTILIZATION only) Specifies the length of the period, in minutes, the event statistics are for.

Limits: Integer

RMTSYS=*remote_regions*

Specifies a comma-delimited list of the ACB names of the remote regions in which you also want to raise the audit event (for example, when a user performs an action on a remote resource). If the remote region is linked and has auditing enabled for the event type, the event is raised and recorded for that region. For this to be successful, the user that invoked the API must be defined in the remote region.

TRACE

Specifies whether to trace each invocation of the API by writing NMAU0001 messages to the activity log.

TRACE=NO has effect only if the &GLBL$NMAUTRC global variable is *not* set to YES or Y.

Default: NO

$NMAUAPI OPT=REGISTER-COUNTER—Register Counter for Utilization Statistics

The $NMAUAPI OPT=REGISTER-COUNTER API option creates a counter for the activities to be audited. The counter enables statistics to be gathered for those activities through the ADJUST-COUNTER option.

This API option has the following format:

```
$NMAUAPI OPT=REGISTER-COUNTER
         OBJCLASS=#class
        [OBJNAME=object_name]
         ACTION=action_type
        [SPROC=procedure_name]
        [TRACE={NO | YES}]
```

OPT=REGISTER-COUNTER

Specifies that a counter be created for activities that match the other parameters.

OBJCLASS=#*class*

Specifies the class (user-defined) of the objects to be audited. The class name must start with # (for example, #CLASS01).

Limits: Eight characters, including #

OBJNAME=*object_name*

(Optional) Identifies the object for which the counter is registered.

Limits: 232 characters

ACTION=*action_type*

Specifies the performed action. The API provides the following predefined actions:

ACTION	ADD	CLOSE
COMMAND	COMPILE	CREATE
DELETE	ENHANCE	EXECUTE
ISSUE	LOAD	MODIFY
REPLY	RESET	SET
START	STATECHANGE	STOP
SUPPRESS	TRIGGER	UPDATE

In SMF, actions are represented in hexadecimal values (see page 401).

If you specify your own action, it will be recorded in SMF as X'FFFF' (USER-DEFINED) with the TEXT field as *action_type*:*action_text*. If you want to assign a specific hexadecimal ID to a user action not in the list, you can define it through Common Application Services (CAS) (see page 387).

Limits: 12 characters

SPROC=*procedure_name*

(Optional) Specifies the procedure that services this counter:

- For OPT=REGISTER-COUNTER, it sets the initial value of the counter.
- For OPT=ADJUST-COUNTER, it calculates the value of the counter.
- For OPT=RESET-COUNTER, it resets the counter.

The procedure uses &NM*name* variables to share information between the options.

A sample procedure is provided in the MSSAMP($NMAUSP2) data set member.

TRACE

Specifies whether to trace each invocation of the API by writing NMAU0001 messages to the activity log.

TRACE=NO has effect only if the &GLBL$NMAUTRC global variable is *not* set to YES or Y.

Default: NO

$NMAUAPI OPT=ADJUST-COUNTER—Gather Statistics

The $NMAUAPI OPT=ADJUST-COUNTER API option gathers statistics for the audited activities. You use this option after you register the counter.

This API option has the following format:

```
$NMAUAPI OPT=ADJUST-COUNTER
         OBJCLASS=#class
        [OBJNAME=object_name]
         ACTION=action_type
         VALUE=adjust_value
        [TRACE={NO | YES}]
```

OPT=ADJUST-COUNTER

Specifies that the value of the counter be adjusted. The other parameters should match those used when the counter is created.

OBJCLASS=#*class*

Specifies the class (user-defined) of the objects to be audited. The class name must start with # (for example, #CLASS01).

Limits: Eight characters, including #

OBJNAME=*object_name*

(Optional) Identifies the object for which statistics is to be gathered.

ACTION=*action_type*

Specifies the performed action. The API provides the following predefined actions:

ACTION	ADD	CLOSE
COMMAND	COMPILE	CREATE
DELETE	ENHANCE	EXECUTE
ISSUE	LOAD	MODIFY
REPLY	RESET	SET
START	STATECHANGE	STOP
SUPPRESS	TRIGGER	UPDATE

In SMF, actions are represented in hexadecimal values (see page 401).

If you specify your own action, it will be recorded in SMF as X'FFFF' (USER-DEFINED) with the TEXT field as *action_type*:*action_text*. If you want to assign a specific hexadecimal ID to a user action not in the list, you can define it through Common Application Services (CAS) (see page 387).

Limits: 12 characters

VALUE=*adjust_value*

Specifies a number to decrement or increment the counter.

Limits: Integer, either negative or positive

TRACE

Specifies whether to trace each invocation of the API by writing NMAU0001 messages to the activity log.

TRACE=NO has effect only if the &GLBL$NMAUTRC global variable is *not* set to YES or Y.

Default: NO

$NMAUAPI OPT=RESET-COUNTER—Reset Counter

The $NMAUAPI OPT=RESET-COUNTER API option resets the collected statistics to zero.

This API option has the following format:

```
$NMAUAPI OPT=RESET-COUNTER
         OBJCLASS=#class
        [OBJNAME=object_name]
         ACTION=action_type
        [TRACE={NO | YES}]
```

OPT=RESET-COUNTER

Resets the value of the counter. Match the other parameters to the values used when the counter is created.

OBJCLASS=#*class*

Specifies the class (user-defined) of the objects being audited.

Limits: Eight characters, including #

OBJNAME=*object_name*

(Optional) Identifies the object for which statistics are being gathered.

ACTION=*action_type*

Specifies the performed action.

TRACE

Specifies whether to trace each invocation of the API by writing NMAU0001 messages to the activity log.

TRACE=NO has effect only if the &GLBL$NMAUTRC global variable is *not* set to YES or Y.

Default: NO

$NMAUAPI OPT=DEREGISTER-COUNTER—Deregister Counter

The $NMAUAPI OPT=DEREGISTER-COUNTER API option deletes a counter. No more statistics are gathered for the corresponding activities.

This API option has the following format:

```
$NMAUAPI OPT=DEREGISTER-COUNTER
         OBJCLASS=#class
        [OBJNAME=object_name]
         ACTION=action_type
        [TRACE={NO | YES}]
```

OPT=DEREGISTER-COUNTER

Specifies that the counter be deleted. The other parameters should match those used when the counter is created.

OBJCLASS=#*class*

Specifies the class (user-defined) of the objects being audited.

Limits: Eight characters, including #

OBJNAME=*object_name*

(Optional) Identifies the object for which the counter is deregistered.

ACTION=*action_type*

Specifies the performed action.

TRACE

Specifies whether to trace each invocation of the API by writing NMAU0001 messages to the activity log.

TRACE=NO has effect only if the &GLBL$NMAUTRC global variable is *not* set to YES or Y.

Default: NO

Return Codes

The $NMAUAPI API has the following return codes:

0

Indicates that the API call was successful.

4

Indicates that the event was raised but auditing was not enabled for it.

6

(RAISE-EVENT option only) Indicates that the API was called on a remote system (using APPC) but the API procedure could not start there.

8

Indicates validation error with the calling parameters.

The &SYSMSG variable contains the message that provides more information about an error condition.

Define User Actions

The $NMAUAPI API uses the $NMAUDITACTIONS CAS table to identify the specified action. Each action is identified by a hexadecimal value. If an action is not in the table, the API records the action as X'FFFF' in SMF. To make reporting easier, you can add your own actions to the table.

To define user actions to the $NMAUDITACTIONS CAS table

1. Enter the **/CASTAB** panel shortcut.

   The list of CAS table definitions appears.

2. Enter **L $NMAUDITACTIONS**.

   The list scrolls and locates the $NMAUDITACTIONS table definition.

3. Enter **LE** beside $NMAUDITACTIONS.

   The entries for the table definition appear.

4. Press F4 (Add).

   The Table Entry Definition panel appears.

5. Specify the action name (alphabets with no spaces), and provide a unique hexadecimal value in the range X'1000' to X'1FFF' to identify it. Press F3 (File).

   The specified action is added to the table. If the action is recorded in SMF through an API call, it is recorded with the specified hexadecimal value.

Appendix H: Automation Services SMF Record Format

This section contains the following topics:

Automation Services SMF Records

The following types of SMF records are written by Automation Services:

EventView SMF record

Contains two formats; the first is used to indicate the start of statistics collection, the second contains the actual data collected by EventView.

ResourceView and ServiceView SMF record

Contains data collected about resources or services. One record is written for each resource or service.

User-defined record

Contains a number of user-specified formats that contain data written by the SMFWRITE macro.

SMF Header Format

SMF records described in this appendix are written by Automation Services and have a header of the format shown in the following table:

Offset		Position	Contains...
Dec	**Hex**		
0	0	1-18	SMF record header
18	12	19-22	Subsystem identifier
22	16	23-24	The SMF record subtype
24	18	25-36	The region ID
36	24	37-*n*	The data to be written

How to Obtain User SMF Record Types

You should obtain user SMF record types (128-255) for both old (unsubtyped) and new (subtyped) records. To do this, contact the System Programming group and ask them to do the following:

1. Assign SMF record types that do not conflict with other users or applications.
2. Make sure that those numbers are not excluded by SMF.
3. Make sure that installed SMF exits do not ignore assigned SMF record types, that is, they are not written to SMF data sets.

EventView SMF Record Format

The EventView SMF record that indicates the start of statistics collection has a subtype of 2000 (hexadecimal value). This subtype has no data associated with it.

The EventView SMF record that contains the EventView statistics data has a subtype of 2200 (hexadecimal value). All fields in the record are four bytes long.

The following table lists the fields in this record:

Offset		Name	Length	Format	Description
Dec	Hex				
36	24	MSGCOUNT	4	BINARY	Number of messages processed
40	28	SUPPCOUNT	4	BINARY	Number of messages suppressed
44	2C	MODCOUNT	4	BINARY	Number of messages modified
48	30	REPCOUNT	4	BINARY	Number of replies issued to WTORs
52	34	SYSTEMCMD	4	BINARY	Number of system commands issued
56	38	SOLVECMD	4	BINARY	Number of system services commands issued
60	3C	SSOPRCSS	4	BINARY	Number of Automation Services processes issued
64	40	SSOCMD	4	BINARY	Number of Automation Services commands issued
68	44	VARSET	4	BINARY	Number of variables set
72	48	TMRPOP	4	BINARY	Number of timers that were triggered
76	4C	ISSUEMSG	4	BINARY	Number of messages issued

ResourceView and ServiceView Record Format

The ResourceView and ServiceView SMF record has a subtype of 3000 (hexadecimal value).

The following table shows the fields in this record:

Offset		Name	Length	Format	Description
Dec	Hex				
36	24	SYSNAME	8	EBCDIC	System Image Name
44	2C	SYSVERSION	4	EBCDIC	System Image Version
48	30	RESCLASS	2	EBCDIC	Resource Class
50	32	NAME	18	EBCDIC	Resource or Service Name
68	44	AVIDATE	12	EBCDIC	Resource initialization date
80	50	AVITIME	12	EBCDIC	Resource initialization time
92	5C	AVDATE	4	BINARY	Date
96	60	AVTIME	12	EBCDIC	Time
108	6C	AVSTATUS	12	EBCDIC	Current status
120	78	AVATIME	4	BINARY	Total time available (in minutes)
124	7C	AVUTIME	4	BINARY	Total time unavailable (in minutes)
128	80	AVACOUNT	4	BINARY	Number of times the resource became available
132	84	AVUCOUNT	4	BINARY	Number of times the resource became unavailable
136	88	AVPMSGS	4	BINARY	Number of messages processed for the resource
140	8C	AVPCMDS	4	BINARY	Number of commands issued for the resource

User-defined Record Format

A user-defined record SMF format has a subtype of 9*xxx* (hexadecimal value), where *xxx* is specified in the SMFWRITE macro.

The user defines the data fields in the record.

Appendix I: Audit SMF Record Format

Audit SMF records are identified by subtype X'0001' in the SMF header.

This section contains the following topics:

Audit SMF Record Structure

The Audit SMF record structure is based on the dynamic structure of IBM record 119 or 80. This flexible design provides room for expansion. Each section besides the first one can be repeated many times, up to the maximum length of the SMF record, which is set at 32756 bytes.

The following table lists the fields in this record:

Name	Length (bytes)	Description
Standard header	24	SMF system header.
Self-defining section	36	This section contains information about the number of sections that follow, and their location in the record.
Region section	72	This section contains information about the NetMaster or SOLVE products that produced the record. It is present in any record produced.
Object section	*vv*	This section contains information about the object of the manipulation described in the User section.

Name	Length (bytes)	Description
User section	18	This section contains information about the user of the object described. User names can be either the user ID of the operator of the resource, or the name of the system or subsystem performing the automatic action.
Event section	*vv*	This section contains information about the action performed on the previously described object.

Audit SMF Record Guidelines

Adhere to the following guidelines when using audit SMF records:

- SMF record subtypes are treated as binary halfwords.
- Variable length fields are always preceded by a 2-byte length indicator.
- Fixed length text (EBCDIC) fields are initialized with blanks (x'40').
- Other fixed length fields are initialized with nulls (x'00').

SMF Record Identifier (Subtyped)

The SMF record identifier (number) is in the range of 128-255 and is defined during installation. Use Customizer parameter group INTERFACES/SMF to define this number.

Self-Defining Section

The following table lists the fields in this section of the record:

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
00	00	TRIPLNUM	2	BINARY	Number of triplets in this record
02	02	RECLEVEL	2	BINARY	Record generation level, currently 1

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
04	04	REGNOFF	4	BINARY	Offset to Region section
08	08	REGNLEN	2	BINARY	Binary Length of Region section (always '48'x)
10	0A	REGNNUM	2	BINARY	Number of Region sections (always '1'x)
12	0C	OBJOFF	4	BINARY	Offset to Object identification section
16	10	OBJLEN	2	BINARY	Binary Length of Object section
18	12	OBJNUM	2	BINARY	Number of Object sections (always '1'x)
20	14	USEROFF	4	BINARY	Offset to User section
24	18	USERLEN	2	BINARY	Binary Length of User section (always '12'x)
26	1A	USERNUM	2	BINARY	Number of User sections (always '1'x)
28	1C	EVNTOFF	4	BINARY	Offset to Event section
32	20	EVNTLEN	2	BINARY	Binary Length of Event section
34	22	EVNTNUM	2	BINARY	Number of Event sections (always '1'x)

Region Section

The following table lists the fields in this section of the record:

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
00	00	DL	6	EBCDIC	Delivery level, (DDDDSS, '060200')
06	06	PLEXID	8	EBCDIC	Sysplex name

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
14	0E	SYSNAME	8	EBCDIC	System name
22	16	NETID	8	EBCDIC	VTAM network identifier
30	1E	DMNAME	4	EBCDIC	Product region domain name
34	22	ACBNAME	8	EBCDIC	Product region ACB Name
42	2A	LPARNAME	8	EBCDIC	Product region LPAR name
50	32	JOBID	8	EBCDIC	Product Region job identifier, such as STC15097
58	3A	JOBNAME	8	EBCDIC	Product Region Jobname, such as DENM10
66	42	NUMBER	4	BINARY	Reserved
70	46	ASID	2	BINARY	Product Region ASID number

Object Section

The following table lists the fields in this section of the record:

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
00	00	LOCATION	8	EBCDIC	Object location
08	08	CLASS	8	EBCDIC	Object class
16	10	NAMELEN	2	BINARY	Length of object name
18	12	NAME	*vv*	EBCDIC	Object name
vv		TEXTLEN	2	BINARY	Length of object text
vv		TEXT	*vv*	EBCDIC	Object text

Note: For information about audited objects, see the online help for the AUDIT parameter group.

User Section

The following table lists the fields in this section of the record:

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
00	00	LOCATION	8	EBCDIC	User location
08	08	TYPE	2	BINARY	User type
10	0A	NAME	8	EBCDIC	User name

User Types

The following table lists the user types in the audit SMF record:

Number		Type
Dec	Hex	
00	0000	Reserved, do not use
01	0001	NMAOMP
02	0002	NMBLOG
03	0003	NMBMON
04	0004	NMBSVR
05	0005	NMBSYS
06	0006	NMCNMP
07	0007	NMLOGP
08	0008	NMOPER
09	0009	NMPPOP
10	000A	NMUSER
11	000B	SOLVAOMP

Number		Type
Dec	Hex	
12	000C	SOLVBLOG
13	000D	SOLVBMON
14	000E	SOLVBSVR
15	000F	SOLVBSYS
16	0010	SOLVCNMP
17	0011	SOLVLOGP
18	0012	SOLVOPER
19	0013	SOLVPPOP
20	0014	SOLVUSER

Event Section

The following table lists the fields in this section of the record:

Offset		Name	Length (bytes)	Format	Description
Dec	Hex				
00	00	EVNTTYPE	2	BINARY	Event type
02	02	DATE	8	EBCDIC	UTC date of the event, YYYYMMDD
10	0A	TIME	11	EBCDIC	UTC time of the event, HH:MM:SS:hh
21	15	PERIOD	2	BINARY	Period in minutes
23	17	ACTION	2	BINARY	Action types
25	19	VALUE	8	BINARY	Value of the action, such as number of suppressions
33	21	TXTLEN	2	BINARY	Length of the action text
35	23	TEXT	*vv*	EBCDIC	Text of action performed, such as command text

Event Types

The following table lists the event type numbers in decimal and hexadecimal:

Number		Descriptions
Dec	**Hex**	
0	0000	Reserved, do not use
1	0001	Access
2	0002	Application
3	0003	Configuration
4	0004	Procedural
5	0005	Serviceability
6	0006	Utilization

Action Types

The following table lists the action type numbers in decimal and hexadecimal:

Number		Type
Dec	**Hex**	
0	0000	Reserved, do not use
1	0001	Action
2	0002	Add
3	0003	Update
4	0004	Delete
5	0005	Command
6	0006	Suppress
7	0007	Enhance
8	0008	State change

Number		Type
Dec	**Hex**	
9	0009	Load
10	000A	Start
11	000B	Stop
12	000C	Close
13	000D	Reset
14	000E	Modify
15	000F	Reply
16	0010	Issue
17	0011	Trigger
18	0012	Create
19	0013	Set
20	0014	Compile
21	0015	Execute
22–34	0016–0022	Reserved
35	0023	Read
36	0024	Rename
37	0025	Print
38	0026	Submit
39–4095	0027–0FFF	Reserved
4096–65534	1000–FFFE	User-defined
65535	FFFF	User actions not defined

More information:

Define User Actions (see page 387)

Appendix J: RAMDB Definition Classes

This section contains the following topics:

Definition Classes

ResourceView definitions created in the knowledge base are differentiated by classes.

The following table lists the common definition classes. Classes that are specific to CA SOLVE:Operations Automation for CICS are identified by CICS in parentheses.

Definition	Class Name	Class Number
CICS database (CICS)	CICDB	06
CICS file (CICS)	CICFIL	05
CICS link (CICS)	CICLNK	07
CICS transaction (CICS)	CICTRN	04
Direct access storage device	DASD	16
Initiator	INIT	10
Internal resource	INTNL	21
Job	JOB	19
Job Entry Subsystem	JES	20
Line	LINE	14
Linux application	LXAPPL	33
Linux image	LINUX	32
Printer	PRT	11
Service	SVC	61
Spool	SPOOL	13
Started task	STC	02
Sysplex resource	SYSPLX	29
Tape or cartridge unit	TAPE	18

Definition	Class Name	Class Number
User class resource	USRCLS	17
VM guest	VMGST	31

Appendix K: RAMDB Variables

This section contains the following topics:

Variable Types

Variables let you access knowledge base data, find out about the status of services and resources, and extract information about messages.

Variables comprise the following types:

- Variables that contain data in the knowledge base
- Variables that contain status information
- Variables that contain message information

This appendix describes these variables. The variables that are available depend on the product you are using.

Note: For information about other variables that are specific to your product, see the *Administration Guide*.

Knowledge Base Variables

Use the following variables to retrieve data from the knowledge base. Variables that are specific to a particular product are identified in parentheses.

You can use the variables to pass values to the following:

- Fields in a template
- Fields in a service or resource definition
- Parameters in macros used in the definition
- NCL procedures invoked from the definition.

&ZRMDBCLASS

Contains the class number.

&ZRMDBCLDESCS

Contains the class name.

&ZRMDBREL1 to &ZRMDBREL25

Contain the names of the immediate parents.

&ZRMDBSCHED

Contains the name of the availability map.

&ZRMDBSYSNAME

Contains the name of the system image.

&ZRMDBVERSION

Contains the version of the system image.

Description Panel Fields

The following fields, if applicable, are displayed on the Description panel of a service or resource definition:

&ZRMDBACBNAME (CICS and z/OS)

Contains the value of the ACB Name field.

&ZRMDBACTNAME

Contains the same value as &ZRMDBNAME. However, if the value is qualified, the qualifier is dropped. For example, a CDMON resource name has the owner as the qualifier, *owner_name*.*resource_name*. This variable returns only *resource_name*.

&ZRMDBMODE

Contains the value of the Operation Mode field. The value can be AUTOMATED, IGNORED, MANUAL, OFF, or STARTAUTO.

&ZRMDBNAME

Contains the value of the field that identifies the service or resource.

&ZRMDBOWNRCL#

Contains the class number of the resource owner.

&ZRMDBOWNRCLS

Contains the value of the field that identifies the class name of the resource owner.

&ZRMDBOWNRNME

Contains the value of the field that identifies the owner of the resource.

&ZRMDBSDESC

Contains the value of the Short Description field.

&ZRMDBTEMPLAT

Contains the value of the TemplateName field.

&ZRMDBTYPE

Contains the value of the Type field.

Activation and Inactivation Details Fields

The following field is displayed on the Activation Details panel of a resource definition:

&ZRMDBINITCMD

Contains the value of the Command field.

The following field is displayed on the Inactivation Details panel of a resource definition:

&ZRMDBTMRTCMD

Contains the value of the Command field.

The following field is displayed on the Force Inactivation Details panel of a resource definition:

&ZRMDBFTRMCMD

Contains the value of the Command field.

Display and Heartbeat Field

The following field is displayed on the Display and Heartbeat Details panel of a resource definition:

&ZRMDBDISPCMD

Contains the value of the Command field.

Automation Log Details Fields

The following fields are displayed on the Automation Log Details panel of a service or resource definition:

&ZRMDBLOGAUDT

Contains the value of the Log Internal Audit Trail field.

&ZRMDBLOGMVSC

Contains the value of the Log to Console field.

&ZRMDBLOGOCS

Contains the value of the Log to OCS Window field.

&ZRMDBLOGRAM

Contains the value of the Log to Automation Log field.

&ZRMDBLOGSYS

Contains the value of the Log All System Msgs field.

&ZRMDBLOGTSIZ

Contains the value of the Log Table Size field.

First Level Support Details Fields

The following fields are displayed under First Level Support Details on the Owner Details panel of a service or resource definition:

&ZRMDBREOGRP1

Contains the value of the Group field.

&ZRMDBREOPAG1

Contains the value of the Pager Number field.

&ZRMDBREOPHA1

Contains the value of the Phone After Hours field.

&ZRMDBREOPHB1

Contains the value of the Phone Business Hours field.

&ZRMDBREOWNN1

Contains the value of the Name field.

&ZRMDBRESOID1

Contains the value of the Userid field.

Second Level Support Details Fields

The following fields are displayed under Second Level Support Details on the Owner Details panel of a service or resource definition:

&ZRMDBREOGRP2

Contains the value of the Group field.

&ZRMDBREOPAG2

Contains the value of the Pager Number field.

&ZRMDBREOPHA2

Contains the value of the Phone After Hours field.

&ZRMDBREOPHB2

Contains the value of the Phone Business Hours field.

&ZRMDBREOWNN2

Contains the value of the Name field.

&ZRMDBRESOID2

Contains the value of the Userid field.

Status Variables

Use the variables in the following table to retrieve the status of a service or resource.

You can use the variables in the same places that you use knowledge base variables.

&ZRMSTACTSTAT

Contains the base actual state only. The &ZRMSTPHYSTAT can contain any of the detectable actual states. The value can be ACTIVE, INACTIVE, STARTING, STOPPING, or UNKNOWN.

&ZRMSTACTDESC

Contains information about the actual state in the &ZRMSTPHYSTAT variable (for example, the message that sets the state). The information is displayed on the Modes and States panel when an S (Status) command is executed.

&ZRMSTACTSTA0

Contains information about the base actual state in the &ZRMSTACTSTAT variable (for example, the message that sets the state).

&ZRMSTARMFLAG

Contains information that indicates whether a resource is registered to the automatic restart manager (ARM) or if ARM is restarting the resource. The value can be YES, NO, or RECOVERY.

&ZRMSTAUTSTAT

Contains the automation status. The value can be FAILED, IN PROGRESS, or NONE. The information is displayed on the Modes and States panel when an S (Status) command is executed.

&ZRMSTCLASS

Contains the class number (for example, 17 for the user class).

&ZRMSTCLDESCL

Contains the class description.

&ZRMSTCLSNAME

Contains the class name.

&ZRMSTSDESC

Contains the short description of the resource as specified in the Short Description field of the resource definition.

&ZRMSTDESSTAT

Contains the desired state scheduled by the availability map. The value can be ACTIVE, INACTIVE, or RESET.

&ZRMSTDESSTA0

Contains information about the scheduled desired state (for example, the time when the state is set).

&ZRMSTDSTACUR

Contains the current desired state. The value can be ACTIVE or INACTIVE.

&ZRMSTDSTACU0

Contains information about the current desired state (for example, whether the state is scheduled or overridden).

&ZRMSTDSTAOV

Contains the desired state override. The value can be ACTIVE, INACTIVE, or NONE.

&ZRMSTDYNAMIC

Contains the value that indicates whether the definition for the resource is dynamic. The value can be NO or YES.

&ZRMSTEXIT

Contains the value that indicates whether a state change exit process exists. The value can be NO or YES.

&ZRMSTEXTDISP

Contains any activated extended display.

&ZRMSTMODECUR

Contains the current operation mode. The value can be AUTOMATED, IGNORED, or MANUAL.

&ZRMSTMODECU0

Contains information about the current operation mode (for example, whether the mode is overridden).

&ZRMSTMODEDB

Contains the operation mode specified in the definition. The value can be AUTOMATED, IGNORED, MANUAL, OFF, or STARTAUTO.

&ZRMSTMODEMAP

Contains the operation mode scheduled by the availability map. The value can be AUTOMATED, IGNORED, MANUAL, NONE, RESET, or STARTAUTO.

&ZRMSTMODEOV

Contains the operation mode override. The value can be AUTOMATED, IGNORED, MANUAL, or NONE.

&ZRMSTNAME

Contains the name of the resource or service.

&ZRMSTNMDID

Contains the domain ID of the region that monitors and controls the resource.

&ZRMSTNRMSTAT

Contains the logical state. The value can be ATTENTION, DEGRADED, FAILED, INERROR, OK, PENDING, STARTING, STOPPING, or UNKNOWN.

&ZRMSTOBJID

Contains the object ID of the record. The object ID is the concatenation of system image name, system image version, class number, and name.

&ZRMSTPHYSTAT

Contains the actual state. The value can be ACTIVE, DEGRADED, FAILED, INACTIVE, STARTING, STOPPING, or UNKNOWN.

&ZRMSTSYSNAME

Contains the name of the system image to which the resource belongs.

&ZRMSTTYPE

Contains the resource type as specified in the Type field of the resource definition.

Active System Image Variables

The following variables return the name and version of the local active system image:

- &ZRMSYSNAME
- &ZRMVERSION

Message Variables

Use these variables to retrieve information about a message. Some of the variables have equivalent AOM NCL system variables that are described in more detail in the *Network Control Language Reference Guide*.

You can use the variables to pass values to a message rule, to the parameters of macros used in the rule, and to NCL procedures invoked from the rule.

Note: The special messages prefixes ($AA-, $DN-, or $MN-) may be used in ResourceView to enhance functionality. A message captured by using such a prefix has the prefix included in the message variables.

&ZMSGATEXT (&AOMATEXT)

Contains the text of the current line of a message.

&ZMSGAWORD*n*

Contains a word in the current line of a message. *n* is a number indicating the position of the word in the message and is in the range 1 through 32. Words are delimited by a blank or a comma.

&ZMSGJOBID (&AOMJOBID)

Contains the identification number of the job that sends the message.

&ZMSGJOBNM (&AOMJOBNM)

Contains the name of the job that issued the message. The value may be overridden by a job name supplied by JES. Thus, messages originating from JES can have the name of the target job, rather than the JES job name.

&ZMSGMSGID (&AOMMSGID)

Contains the first word of the message text and is equivalent to &ZMSGWORD1. If the message is a multiline WTO or WTOR message, &ZMSGMSGID contains the first word of the major line text.

&ZMSGTEXT (&AOMTEXT)

Contains the text of the message. If the message is a multiline WTO or WTOR message, &ZMSGTEXT contains the first (major) line of the message. Use the &ZMSGATEXT variable to retrieve the current line (which can be a minor line) of a message.

&ZMSGTIME

Contains the time of message arrival, in the form *hh.mm.ss*. The value can be in the range 00.00.00 through 23.59.59.

&ZMSGWORD*n*

Contains a word in the message text. If the message is a multi-line WTO or WTOR message, it is treated as one long string and ZMSGWORD*n* variables are assigned accordingly. Words are delimited by a blank or a comma. Use the &ZMSGAWORD*n* variable to retrieve a word in the current line (which can be a minor line) of a message.

&ZMSGWRID (&AOMWRID)

Contains the WTOR reply number. The value is blank if the message is not of the WTOR type.

Variables Available to EventView Message Group Rules

The following variables are available to EventView message rules only:

&ZMSGIJOBN (&AOMIJOBN)

Contains the name of the job that issued the WTO or WTOR message.

&ZMSGSYSNM

Contains the name of the system from which the message originates.

Variables Available to Completed EventView Message Group Rules

The following variables are available to completed (or triggered) EventView message group rules:

&ZMSGCORR

Contains the correlation key used for the triggered message group rule.

&ZMSGGRP

Contains the name of the triggered message group rule.

&ZMSGTXTN

Contains the number of messages that triggered the message group rule.

&ZMSGTXT*n*

Contains the text of one of the messages that triggered the message group rule. *n* is a message arrival sequence number and is in the range 1 to &ZMSGTXTN.

Variables Not Available to EventView Correlation keys, Replacement Text, and ZREV Variables

The following variables are not available to EventView correlation keys, replacement text, and ZREV variables:

&ZMSGDATE

Contains the date of message arrival, in the form *dd-mmm-yyyy* (for example, 14-JUN-2000).

&ZMSGDAY

Contains the day of message arrival, in the form *ddd* (for example, WED).

Variables Not Available to EventView

The following variables are not available to EventView:

&ZMSGLINE*n*

Contains each line of a multi-line WTO or WTOR, where &ZMSGLINE1 is the major line.

&ZMSGLINES

Contains the number of lines in a multi-line WTO or WTOR.

&ZMSGLnW*n*

Contains a word from a line in a multi-line WTO or WTOR, for example, &ZMSGL24w16 is the 16th word in line 24.

Appendix L: Process Macros

This section contains the following topics:

Macros

Process macros are NCL procedures that are the building blocks of processes. Your product supplies a set of macros.

Each macro has a set of parameters, some of which have default settings which can be modified. Other parameters do not have a default setting and must be specified by you. You specify the parameters on the Macro Parameter Definition panel.

To display the Macro Parameter Definition panel, enter **P** beside the process step.

To determine which parameters (fields) on the Macro Parameter Definition screen are mandatory, press Enter.

The mandatory fields are highlighted.

Notes:

- Variables returned by a macro can be passed as parameters to the other macros in the same process.
- All macros set the return code in the &$RMMCRC variable. Unless specifically mentioned in the following descriptions, a zero return code means a successful operation and a nonzero return code means an unsuccessful operation.

AOMALERT Macro

Where possible, avoid using this macro. If you want to generate a WTO message, use the WTO macro.

The macro is based on the &AOMALERT NCL verb.

Note: For more information about NCL verbs, see the *Network Control Language Reference Guide*.

CHAIN Macro

The CHAIN macro links the current process to another process that continues the execution.

You can chain processes together so that process A passes control to process B if certain conditions are met. You can define processes as modules and chain them as required. Use the CHAIN macro to chain processes. The macro sets the name of the target process and any associated parameters, and passes control to the target process.

Parameters: CHAIN Macro

Process

A mandatory field that specifies the name of the next process to be executed, provided that certain conditions are met. If no conditions are specified in the step containing the macro, the process executes automatically.

Parameters

Relevant if the process specified in the Process field contains variables that require you to pass values to them.

If the specified process does not require any passed values, this field remains empty.

Example: CHAIN Macro

In the following example, the PROC2 process is called and will be executed. PROC2 contains the variable &NAME which is given a value of TYOUNG.

```
PROD------ Automation Services : CHAIN Macro Parameter Definition -------------
Command ===>                                                    Function=UPDATE

.- Process Details ------------------------------------------------------------.
|                                                                              |
|  Process ..... PROC2                                                         |
|                                                                              |
|  Parameters .. NAME=TYOUNG                                                   |
|                _____________________________________________________________ |
|                                                                              |
'------------------------------------------------------------------------------'
```

In the following example, the PROC5 process is called and will be executed. PROC5 contains the variable &NAME which is given a value of &V1. The value of the &V1 variable can be set, for example, by an EventView message action rule.

```
PROD------ Automation Services : CHAIN Macro Parameter Definition -------------
Command ===>                                                    Function=UPDATE

.- Process Details ------------------------------------------------------------.
|                                                                              |
|  Process ..... PROC5                                                         |
|                                                                              |
|  Parameters .. NAME=&V1                                                      |
|                                                                              |
|                                                                              |
'------------------------------------------------------------------------------'
```

COMMAND Macro

The COMMAND macro issues a product command and interprets the results. It also lets you specify message text to detect the required response message.

Parameters: COMMAND Macro

Command

Is a mandatory field that specifies the name of the command to be issued by the macro.

This field can contain up to 61 characters.

Wait Time

Specifies the maximum time, in seconds, that the region waits for a response message. The time is reset each time a response is received. The macro waits until a message that matches a rule in the Message Text fields is received or until the time expires without receiving any more responses.

This field must contain a number from 1 through 9999. The default is 30.

Wait Time Expiry Return Code

Sets the return code if the expected message does not arrive before the expiry of the time specified in the Wait Time field.

This field must contain a number from 1 through 999. The default is 69.

Response Message Analysis

The following fields specify the rules that apply to response messages. You can specify up to five rules. The action codes enable you to refine the message text definition criteria. More information on the use of action codes is available in the online help.

Message Text

Specifies the initial part of the expected response message. It can contain up to 45 characters.

Return Code

Specifies the value returned by the macro when it receives the response message. The return code must be a number from 0 through 9999.

Extended Filter

Indicates whether an extended filter has been defined. This field is empty until the Message Text and the Return Code fields are completed. If you want to define an extended filter, enter **S** beside the rule to access the Extended Message Filtering panel.

Returned Variables: COMMAND Macro

&$RMMCMSGTEXT

Contains the full text of the message that satisfies the message rules.

&$RMMCWORD*n*

Contains the words in the message, where n indicates the position of the word in the message.

&ZRMMSG*n*

Contains any messages received before the required response message, where n is a number indicating the order in which those messages are received.

For example, if the response to a command consists of three messages A, B, and C, and message B satisfies the message rules, then:

- &ZRMMSG1 contains message A
- &$RMMCMSGTEXT contains message B
- The macro ends on receipt of message B, and does not see message C

Example: COMMAND Macro

In the following example, the COMMAND macro executes the SHOW ALLOC=RAMLOG01 command and waits for a response message. In this case, that message is N15115 RAMLOG01 ALLOCATED SOLVBSYS *hh.mm*.

If this message is not received within 30 seconds, the return code is set to 69.

An extended filter checks for the value of *hh.mm*. More information about the completion of the Extended Message Filtering Panel is available from the online help.

```
PROD----- Automation Services : COMMAND Macro Parameter Definition -----------
Command ===>                                                  Function=UPDATE

.- Command Details ------------------------------------------------------------.
|                                                                              |
| Command ..... SHOW ALLOC=RAMLOG01                                            |
|                                                                              |
| Wait Time ... 30    Wait Time Expiry Return Code ... 69                      |
'------------------------------------------------------------------------------'
.- Response Message Analysis --------------------------------------------------.
|                                 D=Delete Extended Filter  S=Extended Filter  |
|                                                                              |
|           Message Text                                        Return  Extended |
|                                                                Code   Filter?  |
|           N15115 RAMLOG01 ALLOCATED SOLVBSYS                   0        YES    |
```

```
PROD--------- Automation Services : Extended Message Filtering ----------------
Command ===>                                                  Function=UPDATE

. Extended Filter Definition --------------------------------------------------.
|                                                                              |
| Message Text .......... N15115 RAMLOG01 ALLOCATED SOLVBSYS                   |
|                                                                              |
| Wildcard Character .... *                                                    |
'------------------------------------------------------------------------------'
. Message Text Analysis -------------------------------------------------------.
|                                                                              |
|   Strt Word      Scan                                                        |
|   Pos  Num  Opr  Text                                                        |
| 1 001  005  LT   07.00                                                       |
| 2                                                                            |
| 3                                                                            |
| 4                                                                            |
| 5                                                                            |
|                                                                              |
| Expression e.g (1 and (2 or 3))                                              |
'------------------------------------------------------------------------------'

 F1=Help      F2=Split     F3=OK
                           F9=Swap                              F12=Cancel
```

COMPARE Macro

The COMPARE macro compares two values. You can:

- Compare the value in a variable with the value in another variable
- Compare the value in a variable with a fixed value
- Select a subset of the value to be compared

Parameters: COMPARE Macro

Variable Name 1

Is a mandatory field that is used to specify the variable that contains the value you want to compare. You can use the Start of Compare and the Length fields to compare a substring of the value.

Operator

Is a mandatory field that specifies the relational operator to use for the comparison. The value must be one of the following:

- CT (contains)
- EQ (is equal to)
- NE (is not equal to)
- GT (is greater than)
- GE (is greater than or equal to)
- LT (is less than)
- LE (is less than or equal to)

Variable Name 2

Is used to specify a variable that contains the value you want to use as the basis of the comparison.

Constant Value

Is used when you want to specify a fixed text string as the basis of the comparison.

Note: To use a null value for comparison, leave both the Variable Name 2 field and the Constant Value field blank.

Start of Compare

Indicates the start position of the string in variable 1 from which the comparison takes place. The value of this field must be a number from 1 through 255.

Length

Indicates how much of the string in variable 1 is to be compared. The value, if specified, must be a number from 1 through 255. If a value is not specified, the full string or substring, starting from the specified start position, is compared.

Return Codes: COMPARE Macro

0

Comparison criteria satisfied

4

Comparison criteria not satisfied

Example: COMPARE Macro

In the following example, the COMPARE macro checks whether the value of the &A3 variable is greater than the value of the &A2 variable.

```
PROD----- Automation Services : COMPARE MACRO Parameter Definition ------------
Command ===>                                                  Function=BROWSE

.- COMPARE Parameters ------------------------------------------------------.
|                                                                           |
|  Syntax .......... (Variable 1) OPERATOR (Variable 2)> or (Constant)      |
|                                                                           |
|                                                                           |
|  Variable Name 1 ....... A3           (Enter a valid variable name)       |
|                                                                           |
|  Operator .............. GT           (EQ,NE,GT,GE,LT,LE,CT)              |
|                                                                           |
|  Variable Name 2 ....... A2           (Enter a valid variable name)       |
|                                                                           |
|    or Constant Value ...                                                  |
|                                                                           |
|  Start of Compare ...... 1            (Start position within variable 1)  |
|                                                                           |
|  Length ................              (Enter length of comparison)        |
|                                                                           |
'---------------------------------------------------------------------------'

 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

CONCAT Macro

The CONCAT macro concatenates specified data and stores the result in a variable.

Parameters: CONCAT Macro

Data

Specifies the data that you want to concatenate. The data can contain text and variables separated by spaces, which may either be preserved or be removed during concatenation depending on the value in the Preserve Blanks field. The result cannot be more than 256 characters. Excess characters are truncated.

Preserve Blanks

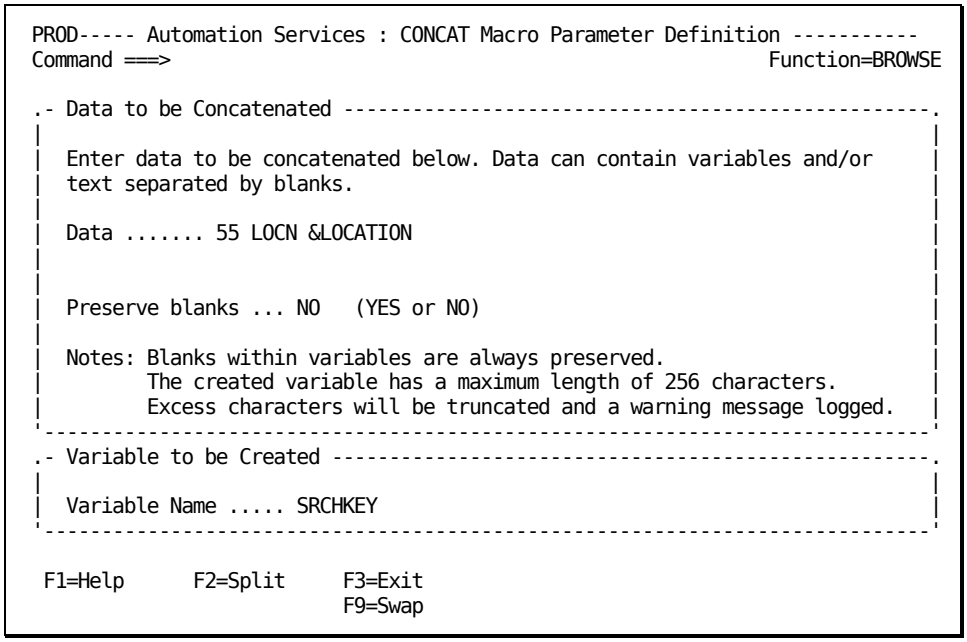
Specifies whether the spaces entered in the Data field should be preserved or removed during concatenation.

Variable Name

Specifies the name of the variable that contains the result of the concatenation.

Example: CONCAT Macro

In the following example, the CONCAT macro creates the &SRCHKEY variable, which contains the value 55LOCN*x*, where *x* is the value of the &LOCATION variable:



DELALERT Macro

The DELALERT macro deletes a user-generated alert.

Parameters: DEFALERT Macro

The DELALERT macro has only one parameter: the identifier of the alert to be deleted. The identifier is the alert reference key with which the alert was generated.

Example: DEFALERT Macro

In the following example, the DELALERT macro deletes an alert called UPSALERT9001:

```
PROD----------------- EventView : Alert Delete -------------------------------
Command ===>                                                  Function=BROWSE

. Alert Reference Key -----------------------------------------------------.
|                                                                          |
| Reference ... UPSALERT9001                                               |
```

EVENT Macro

The EVENT macro issues an N00102 event message that can be retrieved by NCL processes. To receive the message, the NCL process must be profiled for the event by using the PROFILE EDS command. For a description of the command, see the *Network Control Language Reference Guide*.

You can wait for the event message from within a process by using the WAITEVNT macro.

Parameters: EVENT Macro

Name

Identifies the event. The name can contain alphanumeric, @ and # characters, and . or _ characters (for example, SESSION_COMPLETION).

Type

Indicates the type of information contained in the event. Use the types as follows:

APPLICATION

To contain user-defined information.

ACCESS

To contain security alarm information.

CONFIGURATION

To contain object definition and relationship information.

PROCEDURAL

To contain scheduling and process control information.

SERVICEABILITY

To contain availability, degradation, error, fault, and recovery information.

UTILIZATION

To contain accounting, performance, response time, and statistics information.

Scope

Specifies the scope of delivery of the event. Valid values are as follows:

REGION

Restricts event delivery to processes in the region of the event issuer.

SYSTEM

Enables event delivery to processes in the entire region.

Object

Specifies a user-defined object class for the resource or resource pair for which the event is issued. If the value contains embedded spaces, the spaces are translated to underscore (_) characters.

Resource

Names the resource or resource pair (separated by a comma) for which the event is issued. An event can be issued for a pair of resources (for example, a session pair).

Reference

Specifies a code for the event.

Data

Specifies the data in the event.

Example: EVENT Macro

In the following example, the EVENT macro issues an OPERATIONS_CONDITION event. The event contains operations information in the &ZREVATTENDED user-defined EventView variable.

```
PROD------ Automation Services : EVENT Macro Parameter Definition -------------
Command ===>                                                    Function=BROWSE

.- Event Parameters ------------------------------------------------------------.
|                                                                               |
| Name........ OPERATIONS_CONDITION                                             |
|                                                                               |
| Type.......+ SERVICEABILITY                                                   |
| Scope......+ SYSTEM                                                           |
|                                                                               |
| Object......                                                                  |
| (Blanks will be translated to underscores)                                    |
|                                                                               |
| Resource....                                                                  |
| Reference...                                                                  |
|                                                                               |
| Data..... &ZREVATTENDED                                                       |
|                                                                               |
|                                                                               |
|                                                                               |
'-------------------------------------------------------------------------------'

 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

EVVARGET Macro

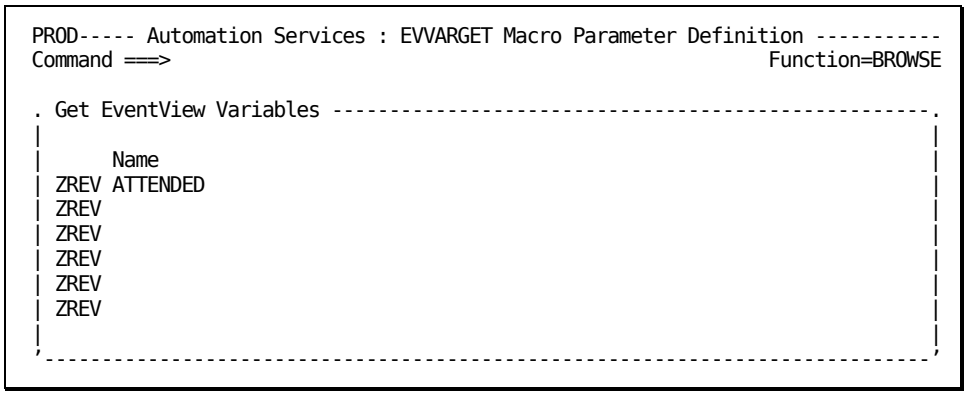
The EVVARGET macro retrieves the values of user-defined EventView variables. When obtained, these variables can be used in subsequent steps in the process that contains the macro.

Parameters: EVVARGET Macro

The EVVARGET macro has only one set of parameters; the character strings that, together with the ZREV prefix, form the names of the variables from which you want to retrieve the values. The character strings can contain variables that are resolved at execution time.

Example: EVVARGET Macro

In the following example, the EVVARGET macro retrieves the value of the &ZREVATTENDED variable. A message can then be sent describing the condition indicated by the value. The message can be used to modify operations behavior.



EVVARSET Macro

The EVVARSET macro sets the values of user-defined EventView variables.

Parameters: EVVARSET Macro

Name

Specifies the character string that, together with the ZREV prefix, forms the name of the variable.

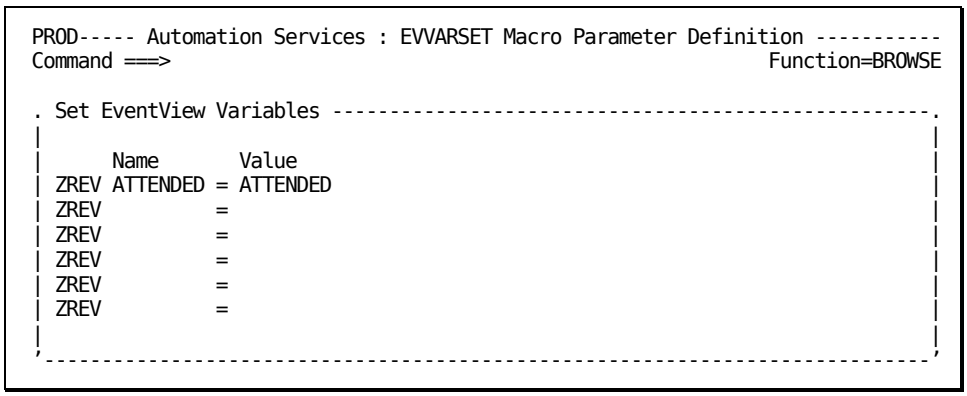
Value

Specifies the value of a named variable.

These fields can contain variables that are resolved at execution time. If you want to code other EventView variables here, they must be retrieved using EVVARGET in a previous step in the process.

Example: EVVARSET Macro

You want the EventView rules to react to messages differently depending on whether the system is attended, as indicated by the value of the &ZREVATTENDED variable. Use the WTOR macro to send a WTOR message and wait for the reply. If a reply is received within two minutes, set the &ZREVATTENDED variable to ATTENDED (see the following).



EXECNCL Macro

The EXECNCL macro executes an NCL procedure in line with the process that contains the macro. That is, the process waits for the NCL procedure to end before continuing on to the next step.

Parameters: EXECNCL Macro

NCL Name

Specifies the name of the NCL procedure executed by the macro.

Parameters

Specifies any parameters required by the NCL procedure specified in the NCL Name field.

Segment Multi-word Parameter Variables

Specifies whether to pass a string of words in a variable as multiple parameters to the procedure.

Example: EXECNCL Macro

In the following example, the EXECNCL macro executes the $RMSMTS procedure. The EXECNCL procedure contains a number of variables, which are defined in the Parameters field of this panel.

```
PROD----- Automation Services : EXECNCL Macro Parameter Definition ------------
Command ===>                                                    Function=BROWSE

.- NCL Procedure Details ------------------------------------------------------.
|                                                                              |
|  NCL Name .... $RMSMTS                                                       |
|                                                                              |
|  Parameters .. SERVICE=GET SYSNAME=&ZRMSYSNAME                               |
|                VERSION=&ZRMVERSION CLASS=17                                  |
|                                                                              |
|                                                                              |
|                                                                              |
|  Segment Multi-word Parameter Variables ... NO     (YES or NO)               |
```

EXTRACT Macro

The EXTRACT macro extracts a segment from a text string.

Parameters: EXTRACT Macro

Where to Extract From—Input

Specifies the string from which you want to extract the text segment. This string can contain text and variables.

Variable to hold Extracted String—Output

Specifies the name of the variable in which you want to put the extracted text string.

How to do the Extraction

The following fields determine the text you want to extract. You must specify at least one of the Starting Position and Find Text fields. If you complete both fields, the macro looks first at the value of the Find Text field and then adds the value of the Starting Position field. The result locates the first character of the extracted segment.

Starting Position

Used in conjunction with the Length to Extract field, the Input field, and the Find Text field (if it is completed) to identify the text string you want to extract.

The Starting Position field accepts a number (*n*) from 1 through 256. The value specifies the first character of the text segment to be extracted.

Length to Extract

Specifies the number of characters you want to extract, effectively indicating the end point of the extracted text string.

The Length to Extract field accepts a number from 1 through 256. The value specifies the number of characters that will be in your extracted string. If a value is not specified in this field, the full string or substring is extracted.

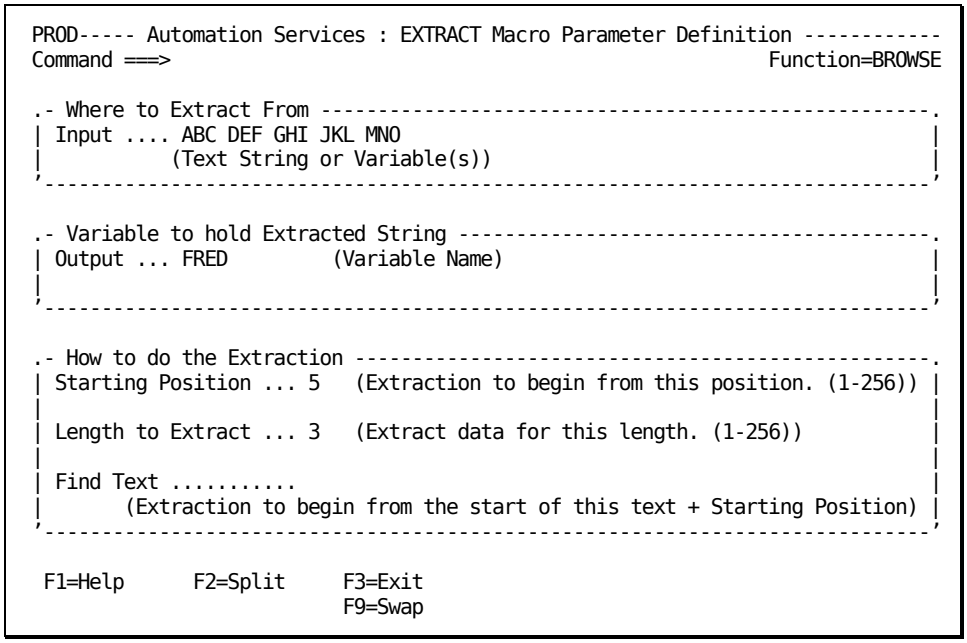
Find Text

If completed, must contain a section of the string specified in the Input field.

The Find Text field accepts a text string from 1 through 53 characters in length. The first character in this text string, plus the value in the Starting Position field, determines the first character of the extracted text. The last character in the extracted text is determined by the value in the Length to Extract field.

Example 1: EXTRACT Macro

In the following example, the EXTRACT macro is used to extract the text string DEF. Because no value is specified in the Find Text field, the reference point for the starting position is the first character of the value of the Input field. In this example, the first character of the extract is the 5th character of the Input text string (D), and because the length to extract is 3, the resulting extract is DEF.



Example 2: EXTRACT Macro

In the following example, the EXTRACT macro is used to extract the text string GHI J. Because no value has been given to the Starting Position field, the reference point for the starting position is the value of the Find Text field. In this example, the first character of the extract is the first character of the Find Text string (G), and because the length to extract is 5, the resulting extract is GHI J.

```
PROD----- Automation Services : EXTRACT Macro Parameter Definition ------------
Command ===>                                                  Function=BROWSE

.- Where to Extract From ------------------------------------------------------.
| Input .... ABC DEF GHI JKL MNO                                               |
|           (Text String or Variable(s))                                       |
'------------------------------------------------------------------------------'

.- Variable to hold Extracted String ------------------------------------------.
| Output ... FRED         (Variable Name)                                      |
|                                                                              |
'------------------------------------------------------------------------------'

.- How to do the Extraction ---------------------------------------------------.
| Starting Position ...     (Extraction to begin from this position. (1-256)) |
|                                                                              |
| Length to Extract ... 5   (Extract data for this length. (1-256))            |
|                                                                              |
| Find Text ..... GH                                                           |
|       (Extraction to begin from the start of this text + Starting Position) |
'------------------------------------------------------------------------------'

 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

Example 3: EXTRACT Macro

In the following example, the EXTRACT macro is used to extract the text string HI JK. In this example, a value has been given to the Find Text field, and therefore that value becomes the reference point for the starting position. Because a value of 2 has been given to the Starting Position field, the first character of the extract is the second character of the Find Text string (H), and because the length to extract is 5, the resulting extract is HI JK.

```
PROD----- Automation Services : EXTRACT Macro Parameter Definition ------------
Command ===>                                                  Function=BROWSE

.- Where to Extract From ------------------------------------------------------.
| Input .... ABC DEF GHI JKL MNO                                               |
|           (Text String or Variable(s))                                       |
'------------------------------------------------------------------------------'

.- Variable to hold Extracted String ------------------------------------------.
| Output ... FRED         (Variable Name)                                      |
|                                                                              |
'------------------------------------------------------------------------------'

.- How to do the Extraction ---------------------------------------------------.
| Starting Position ... 2   (Extraction to begin from this position. (1-256)) |
|                                                                              |
| Length to Extract ... 5   (Extract data for this length. (1-256))           |
|                                                                              |
| Find Text ...........GH                                                      |
|       (Extraction to begin from the start of this text + Starting Position) |
'------------------------------------------------------------------------------'

 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

GENALERT Macro

The GENALERT macro generates an alert for display on the alert monitor. The parameter definition comprises two panels. You must complete the Reference field on the Alert Attributes panel and the Alert Text field on the Alert Definition panel.

If you need to implement a process that generates variations of an alert, you can pass new GENALERT parameter values to the process to create the variations. The passed values override the values specified in the macro. You do not need to create a process for each variation of the alert.

You can specify what actions to take when the alert is raised. To specify actions, press F10 (Actions).

Parameters: GENALERT Macro

Reference

Identifies the alert.

To override this value, specify ALRTREF=*alert-reference* as a process parameter.

Severity

Specifies the importance of the alert. The valid values are 1 through 4. Severity 1 alerts are most important and severity 4 alerts are least important.

To override this value, specify ALRTSEV=*alert-severity* as a process parameter.

Origin

Specifies the source of the alert.

To override this value, specify ALRTORIGIN=*alert-origin* as a process parameter.

Alert Description

Specifies the text that describes the alert condition.

To override this value, specify ALRTDESC=*description* as a process parameter.

Alert Text

Provides a detailed description of the alert condition.

To override this value, specify ALRTTEXT*n*=*alert-text-n* (where *n* is 1 through 5, representing the five lines of text) as process parameters for the lines you want to override.

Alert Recommended Action

Specifies the actions that can be performed to remove the alert condition.

To override this value, specify ALRTACTN*n*=*action-line-n* (where *n* is 1 through 4, representing the four lines of the recommended action) as process parameters for the lines you want to override.

Example: GENALERT Macro

In the following example, the GENALERT macro generates the following UPSALERT9001 alert to remind the operator to test the uninterruptible power supply (UPS):

```
Test UPS
```

```
PROD----------------- EventView : Alert Attributes ---------------------------
Command ===>                                                  Function=BROWSE

. Alert Reference Key ------------------------------------------------------.
|                                                                            |
| Reference ... UPSALERT9001                                                 |
|                                                                            |
'----------------------------------------------------------------------------'
. Alert Attributes ---------------------------------------------------------.
|                                                                            |
| Severity .... 4                                                            |
| Origin ...... ALERTMACRO                                                   |
```

```
PROD----------------- EventView : Alert Definition ---------------------------
Command ===>                                                  Function=BROWSE

. Alert Description --------------------------------------------------------.
|                                                                            |
| TEST UPS                                                                   |
'----------------------------------------------------------------------------'
. Alert Text ---------------------------------------------------------------.
|                                                                            |
| UPS MAINTENANCE                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
'----------------------------------------------------------------------------'
. Alert Recommended Action -------------------------------------------------.
|                                                                            |
| TEST THE UPS WHEN THERE ARE NO CRITICAL SYSTEM ACTIVITIES.                 |
|                                                                            |
|                                                                            |
|                                                                            |
'----------------------------------------------------------------------------'
 F1=Help      F2=Split     F3=Exit
 F7=Backward              F9=Swap     F10=Actions  F11=Panels
```

GETSTAT Macro

The GETSTAT macro discovers the status of a resource or service.

Parameters: GETSTAT Macro

System Name/Version

Identify the system image that owns the resource. If you do not specify an image, then during execution, the macro uses the following values:

- If the macro is associated with a resource definition, the macro uses the image that owns the definition.
- If the macro is not associated with a resource definition (for example, in an EventView rule), the macro uses the active local image.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Resource Class

Specifies the class name of the resource or service for which you require the status. This field can be completed manually, by entering the appropriate valid code, or automatically, by selecting a value from the prompted field value list. The list is displayed by entering **?** in the Resource Class field.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Resource Name

Specifies the name of the resource or service for which you want to retrieve the status.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Variable Prefix

Specifies the prefix of the variables that contain the retrieved status information. This prefix enables you to store the status information retrieved at different times in different variables.

The information is retrieved from the &ZRMST prefixed status variables. The retrieved information is stored in a corresponding set of variables, with the ZRMST prefix replaced by the specified prefix, *prefix*. For example, the information retrieved from the &ZRMSTACTSTAT variable is stored in the &*prefix*ACTSTAT variable.

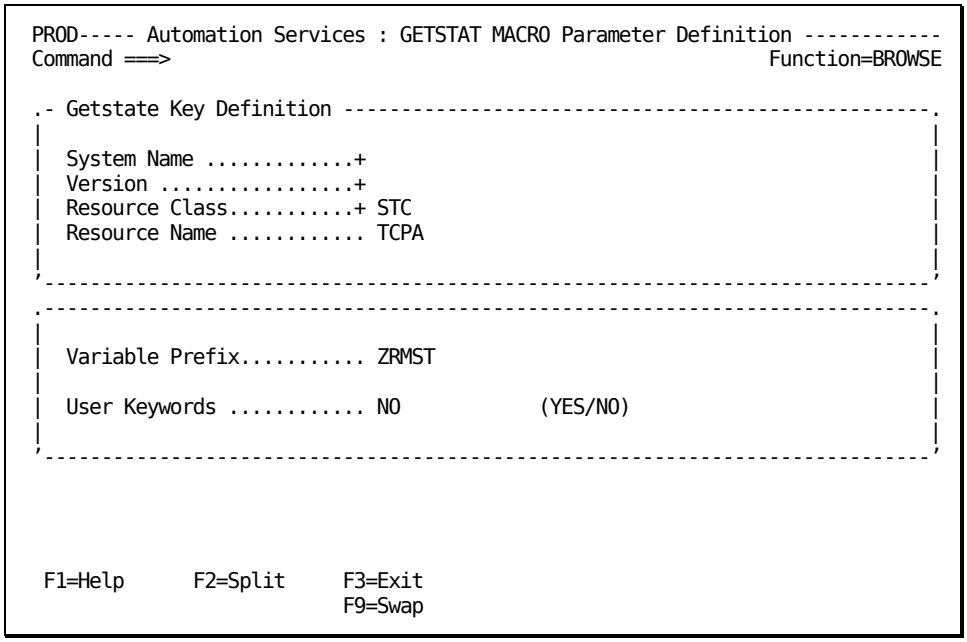
The prefix must *not* start with one of the following characters: # or $.

User Keywords

Enables you to store the keyword that is specified in the User Defined Keyword field on the Define Extended Display Attribute panel of a triggered message rule in a resource definition. The keyword is stored in the &*prefix*USRKEYW variable.

Example: GETSTAT Macro

In the following example, the GETSTAT macro retrieves the status of the STC class resource TCPA into variables of the form &ZRMST*.



GLBLSAVE Macro

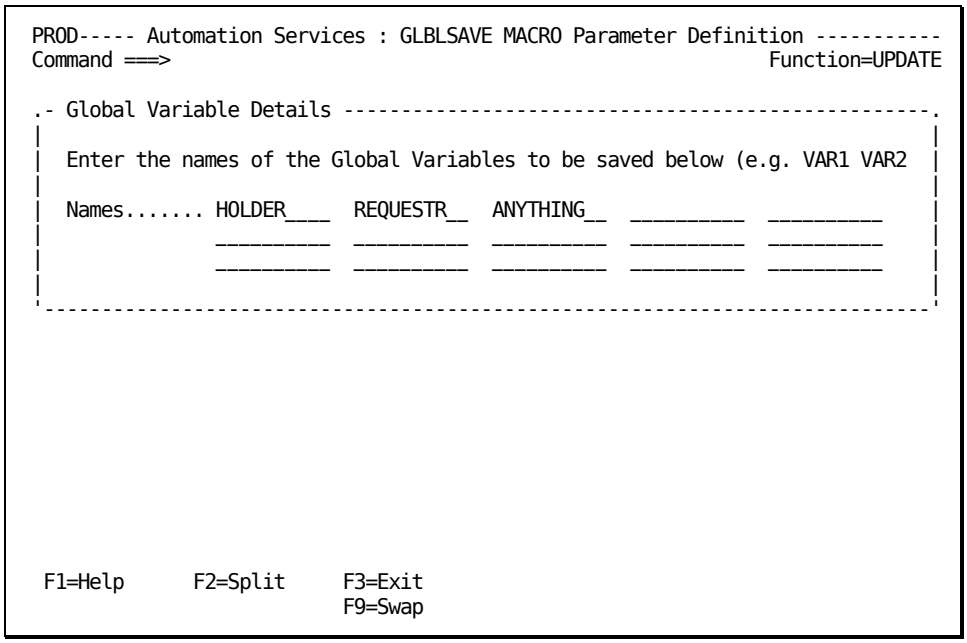
The GLBLSAVE macro saves the specified global variables so that their values are preserved when this region restarts.

Parameters: GLBLSAVE Macro

Names

Identifies the global variables you want to save. Each value is the name of a global variable without the global variable prefix.

Example: GLBLSAVE Macro



HOLDER

Identifies the global variable with the name *global_variable_prefix*HOLDER.

Note: The standard NCL *global_variable_prefix* is &&000.

GOTO Macro

The GOTO macro specifies the next process step to run.

Parameters: GOTO Macro

Target Step Label

Specifies the name that identifies the next process step to run.

Loop Control Limit

Specifies the runaway loop control limit. It prevents the process from being stuck in a loop.

Example: GOTO Macro

In the following example, the GOTO macro specifies that the STEP3 process step is to run next.

```
PROD------ Automation Services : GOTO Macro Parameter Definition --------------
Command ===>                                                    Function=UPDATE

. Goto Target ------------------------------------------------------------------.
|                                                                                |
|  Target Step Label .... STEP3___                                               |
|                                                                                |
|  Loop Control Limit ... 100                                                    |
|                                                                                |
'--------------------------------------------------------------------------------'
```

PARSE Macro

The PARSE macro segments a text string and puts the segmented contents in variables.

Parameters: PARSE Macro

String to be Segmented—Input

Specifies the string that you want to segment. This string can contain text and variables.

This field is mandatory.

Limits: 1 through 64 characters in length

Variables to be Created—Output

Specifies the name of the variables that are to hold your text segments.

This field is mandatory and can hold from 1 through 64 characters. The names must be in one of the following formats:

varname

Use this format when you want to extract one segment only.

varname1,varname2,...,varnamen

Use this format when you want to extract more than one segment, when the segments are separated by delimiter characters such as a space.

varname1(length1),varname2(length2),...,varnamen(lengthn)

Use this format when you want to extract segments delimited by length.

prefix*

Use this format when you want to put extracted segments into variables &*prefix*1 through &*prefix*64.

If you want to skip a portion of the input string during parsing, specify *(*n*) where *n* represents the number of units to skip. An asterisk by itself is the same as *(1). Depending on the value in the By Length field, skipping occurs as follows:

- If the value is NO, *n* segments are skipped.
- If the value is YES, *n* characters are skipped.

How to Segment the Input String

The following fields determine how to segment the text string:

By Length

Indicates whether you want the segmentation to be by length.

This field accepts a YES or NO response. A NO response indicates that the string is to be segmented first by delimiter and then by length. A YES response indicates that segmentation is to be by length only.

Default: NO

By Delimiter

Specifies the delimiter characters for text segments. You can specify up to 8 alphanumeric or special characters.

Default: A space

Note: If you want to define a series of two characters as a delimiter, those characters must be enclosed in quotation marks.

Preserve Leading and Trailing Blanks?

Specifies whether you want to retain leading and trailing blank spaces after segmentation.

Default: NO

Create Null Variables if Consecutive Delimiters Found?

Specifies whether you want a variable (with a null value) to be created if consecutive delimiters are encountered.

Default: YES

Remainder String Variable Name

Specifies the name of the variable that is to hold the text segment that remains after the specified parsing has been completed.

Limits: 1 through 12 characters in length

Variable Name for Count of Variables Created

Specifies the name of a variable to store the number of variables created (excluding the variable for the remainder string).

Example: PARSE Macro

In the following example, the PARSE macro is used to segment the ABC 123 456 789 input string. The delimiter is the default (space). The segments are placed in the &FRW* variables.

The operations results in the following variables:

- The variable &FRW1 contains the segment ABC
- The variable &FRW2 contains the segment 123
- The variable &FRW3 contains the segment 456
- The variable &FRW4 contains the segment 789

```
PROD------ Automation Services : PARSE Macro Parameter Definition -------------
Command ===>                                                  Function=BROWSE

.- String to be Segmented ------------------------------------------------------.
| Input .... ABC 123 456 789                                                     |
|            (Text String or Variable(s))                                       |
'--------------------------------------------------------------------------------'
.- Variables to be Created -----------------------------------------------------.
| Output ... FRW*                                                                |
|            (name or name1,name2... or name1(len),name2(len).. or prefix*)      |
'--------------------------------------------------------------------------------'
.- How to Segment the Input String ---------------------------------------------.
|    By Length ......          (YES or NO)                                       |
| OR By Delimiter ...          (Eight separate characters may be specified)      |
|                                                                                |
| Preserve Leading and Trailing Blanks? ..................... NO  (YES or NO)  |
|                                                                                |
| Create NULL Variables if consecutive delimiters found? .... YES (YES or NO)  |
|                                                                                |
| Remainder String Variable Name (If remainder required) ....                    |
| Variable Name for Count of Variables Created ..............                    |
```

PINGCD Macro

The PINGCD macro checks the availability of a destination (remote) node for a CONNECT:Direct region.

Parameters

CDMGR Name

Specifies the name of the manager for the CONNECT:Direct region to which the destination node is defined.

Remote Node

Identifies the destination node whose availability is to be checked.

Wait Time

Specifies the time (in seconds) to wait for a response.

If the macro does not receive a response by the specified time, a user-specified return code is set.

Limits: 0 to 9999

Wait Time Expiry Return Code

Specifies the code to set when the macro does not receive a response by the time specified in the Wait Time field.

Limits: 0 to 999

Returned Codes

0

Indicates that the destination node is available.

4

Indicates that the destination node cannot be contacted.

8

Indicates that the destination node is not defined in the network map of the specified CONNECT:Direct region.

REPLY Macro

The REPLY macro replies to an outstanding write-to-operator with reply (WTOR) message. The reply can be to one of the following:

- The last WTOR message
- The first WTOR message from a particular job
- A specified WTOR message

The REPLY macro lets you specify message rules to detect any expected response messages.

Parameters: REPLY Macro

Last WTOR?

Enter YES in the Last WTOR? field to indicate that the message in the Reply Text field is in response to the last WTOR message seen by this process (for example, a WTOR message sent by a previous step). If the message is not intended as a reply to the last WTOR, leave the field blank.

Note: If your reply is intended for the last WTOR message, complete the Last WTOR field only. Do not complete either the Jobname or WTOR Message Text fields.

Jobname

If the message in the Reply Text field is intended as a reply to a WTOR message from a particular job, enter the name of the job in the Jobname field.

If you also complete the WTOR Message Text field, your reply is to that message received from the named job. If you do not complete the WTOR Message text field, your reply is to the first WTOR message received from the named job.

Note: If you complete this field, you cannot also complete the Last WTOR? field.

WTOR Message Text

Specifies the text of the message to which you want to reply. It need not contain the complete message, but must contain sufficient text to adequately identify the message.

If you also complete the Jobname field, your reply is to the WTOR message from the named job only.

If you complete this field, you cannot also complete the Last WTOR? field.

Reply

Specifies your reply.

Limits: 1 through 65 characters in length.

Message Text

Specifies the initial part of the expected response message.

Limits: Up to 45 characters.

R/Code

Specifies the value to be returned by the macro when it receives the response message.

Limits: A number from 0 through 999.

E/Filter

Displays YES or NO indicating whether an extended filter has been defined. This field is completed automatically when a rule is defined. It cannot be modified.

Wait Time

Specifies the maximum time, in seconds, that the region waits for a response message. The time is reset each time a response is received. The macro waits until a message that matches a rule in the Message Text fields is received or until the time expires without receiving any more responses.

Limits: A number from 1 through 9999.

Default: 30

Wait Time Expiry Return Code

Sets the return code if the expected message does not arrive before the expiry of the time specified in the Wait Time field.

Limits: A number from 1 through 999.

Default: 69

Returned Variables: REPLY Macro

&$RMMCMSGTEXT

Contains the full text of the message that satisfies the message rules.

&$RMMCWORD*n*

Contain the words in the message, where n indicates the position of the word in the message.

&ZRMMSG*n*

Contain any messages received before the required response message, where n is a number indicating the order in which those messages are received.

&$RMMCWTORID

Contains the ID of the last encountered WTOR message if the macro encounters any WTOR messages before it encounters an expected message.

For example, if the response to a command consists of three messages A, B, and C, and message B satisfies the message rules, then:

- &ZRMMSG1 contains message A
- &$RMMCMSGTEXT contains message B
- The macro ends on receipt of message B, and does not see message C

Example: REPLY Macro

In the following example, the REPLY macro is used to reply to the WTOR message identified by the following text string:

```
T00IJ013R CONFIRM REQUEST TO STOP A/S
```

```
PROD------ Automation Services : REPLY Macro Parameter Definition -------------
Command ===>                                                    Function=UPDATE

.- WTOR Identification ------------------------------------------------------.
| Last WTOR? Or Jobname And/Or WTOR Message Text                             |
|    ___ (Yes)  ________       T00IJ013R CONFIRM REQUEST TO STOP A/S_________ |
'----------------------------------------------------------------------------'
.- Reply Text ---------------------------------------------------------------.
|                                                                            |
| Reply.... Y_____________________________________________________________ |
'----------------------------------------------------------------------------'
.- Response Message Analysis ------------------------------------------------.
|                                D=Delete Extended Filter  S=Extended Filter |
|          Message Text                                     R/Code  E/Filter |
|   ___     T00IJ014I_____________________________________     _0_            |
|   ___     ______________________________________________     ___            |
|   ___     ______________________________________________     ___            |
|   ___     ______________________________________________     ___            |
|   ___     ______________________________________________     ___            |
|                                                                            |
| Wait Time 30__  Wait Time Expiry Return Code 69_                           |
```

RUNPRCSS Macro

The RUNPRCSS macro runs another process in line with the current process. The current process waits for the other process to end before continuing to the next step.

Parameters: RUNPRCSS Macro

Process

Specifies the name of the process to be executed by the macro.

Parameters

Only relevant if the process specified in the Process field contains variables that require you to pass values to them.

If the specified process does not require any passed values, leave this field empty.

Example: RUNPRCSS Macro

In the following example, the RUNPRCSS macro runs the STPRT process. The STPRT process contains the &MODEL and &NAME variables that are defined in the Parameters field of this panel.

```
PROD----- Automation Services : RUNPRCSS Macro Parameter Definition -----------
Command ===>                                                    Function=BROWSE

.- Process Details ------------------------------------------------------------.
|                                                                              |
|  Process ..... STPRT                                                         |
|                                                                              |
|  Parameters .. MODEL=HPL36 NAME="This is a name"                             |
|                                                                              |
|                                                                              |
'------------------------------------------------------------------------------'
```

SETRC Macro

The SETRC macro sets the process return code.

Parameters: SETRC Macro

Return Code

Specifies the value that is returned by a macro when each process step is completed. This is the trigger for the next step to begin, provided that any specified conditions are met.

Limits: A number from 0 through 99

Example: SETRC Macro

In the following example, the SETRC macro is used to set the return code to 21.

```
PROD------ Automation Services : SETRC Macro Parameter Definition -------------
Command ===>                                                    Function=BROWSE

.- Return Code ------------------------------------------------------------.
|                                                                           |
|  Return Code .... 21  (Enter a number between 0 and 99)                   |
|                                                                           |
'---------------------------------------------------------------------------'
```

SETSTATE Macro

The SETSTATE macro sets the actual state and the extended display attributes of a resource or service.

Parameters: SETSTATE Macro

System Name/Version

Identifies the system image that owns the resource. If you do not specify an image, then during execution, the macro uses the following values:

If the macro is associated with a resource definition, the macro uses the image that owns the definition.

If the macro is not associated with a resource definition (for example, in an EventView rule), the macro uses the active local image.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Resource Class

Specifies the class of the item named in the Resource Name field.

Entering a question mark (?) in the Resource Class field displays the Resource Class List panel from which you can select the appropriate class.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Default: &ZRMDBCLASS

Resource Name

Specifies the resource or service for which you are setting the state. The value of this field can be a variable whose value is passed to this macro by the process itself.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Default: &ZRMDBNAME

State

Specifies the actual state you want to set for the named resource or service.

This field is mandatory and must contain one of the following (entered either directly or by using a variable):

- ACTIVE
- DEGRADED
- FAILED
- INACTIVE
- STARTING
- STOPPING
- UNKNOWN

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Description

Specifies the free-form text that can be used to identify who has set the state or the reason for setting that state. The value in this field is displayed as part of the detailed status information, which is accessed from a monitor.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Intensity

Specifies the intensity of the display text and must be either HIGH or LOW. If no value is set, the default value of LOW is assumed.

Color

Specifies the color of the display text and must be one of BLUE, GREEN, PINK, RED, TURQUOISE, WHITE, or YELLOW. If no value is set, the default value of GREEN is assumed.

Highlight

Specifies the highlight used for the display text and must be one of BLINK, REVERSE, or NONE. If no value is set, the default value of NONE is assumed.

Icon Flag

Specifies whether the extended display color of a resource that is in the worst logical state is used on an icon.

If you do not want the icon to use extended display color, specify NO (the default) in this field. For example, if the resource does not require attention, transferring the color to the icon can cause an undesirable change in the icon color.

If you want the icon to use extended display color, specify YES in this field. This setting also forces the state ranking of the resource to equal that of the FAILED logical state. The icon can thus be forced to display this resource even though it is not in the worst logical state. For example, if you rate the condition of a tape mount request important, specify YES in the Use on Graphic Monitor? field.

Text

Specifies the free-form extended status text that overlays the current display.

If you do not want to change the status display, leave the field blank.

If you want to reset the status line to normal display, type ##RESET## in this field.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Example: SETSTATE Macro

In the following example, the SETSTATE macro is used to set the actual state and the extended display according to the parameters passed to the process that contains the macro.

```
PROD----- Automation Services : SETSTATE Macro Parameter Definition -----------
Command ===>                                                  Function=BROWSE

.- Resource Identification ------------------------------------------------.
| System Name ......+                                                      |
| Version ..........+                                                      |
| Resource Class ...+ &CLS                                                 |
| Resource Name ..... &NAME                                                |
'--------------------------------------------------------------------------'
.- Actual State -----------------------------------------------------------.
| State ............ &V1      (Active, Inactive, Failed, Degraded,          |
|                              Starting, Stopping or Unknown)              |
| Description ...... &REASON                                               |
'--------------------------------------------------------------------------'
.- Extended Display -------------------------------------------------------.
| Intensity ... LOW        (High or Low)                                   |
| Color ....... GREEN      (Blue, Green, Pink, Red, Turquoise, White, Yellow) |
| Highlight ... NONE       (Blink, Reverse or None)                        |
| Icon Flag ...            (Use Attributes to change Icon color - Yes or No)  |
|                                                                          |
| Text ........ &EXTDISP                                                   |
'--------------------------------------------------------------------------'
 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

SETVARS Macro

The SETVAR macro creates variables for a process.

The SETVARS macro stores the values of transient variables. For example, the values of the &$RMMCWORD*n* variables change for each executed COMMAND, REPLY, and SYSCMD macro. Using the SETVARS macro, you can store the original values before they change.

Parameters: SETVARS Macro

Variable String

Defines the variables (and their values) required by the process. These variables are passed to all macros in the process.

Example: SETVARS Macro

In the following example, the SETVARS macro sets the value of the &V1 and &V2 variables.

```
PROD----- Automation Services : SETVARS Macro Parameter Definition ------------
Command ===>                                                    Function=BROWSE

.- Variable Details ------------------------------------------------------------.
|                                                                               |
|  Enter the variables to be created below. (e.g. VAR1=TEST VAR2=&$RMMCWORD1)   |
|                                                                               |
|  Variable String... V1=ACTUAL V2=INACTIVE                                     |
|                                                                               |
|                                                                               |
|                                                                               |
'-------------------------------------------------------------------------------'
```

SHDCALL Macro

The SHDCALL macro passes a command to the CA 7 batch scheduler and returns the response.

Note: If you want to use this macro, you must first complete and action the SCHEDAPI Customizer parameter group (shortcut **/PARMS**).

Parameters: SHDCALL Macro

Scheduler Product

Specifies the scheduler product to which the commands are passed.

Scheduler SSID

Specifies the subsystem ID of the scheduler product to which the commands are passed. The default is the value entered in the SCHEDAPI Customizer parameter group.

Command

Specifies one or more commands passed to the scheduler product. Use a semicolon (;) as a command separator.

Time-out

Specifies the maximum time, in seconds, that the region waits for a response from the scheduler product. The time is reset each time a response is received. The macro waits until a message is received, or until the time expires without receiving any response.

Limits: A number from 1 through 999.

Default: 30.

Returned Variables: SHDCALL Macro

&RMCNT

The number of response text lines.

&RM1 to &RM999

Every line in the response.

&RMMSG

The error message if the return code is not zero.

&RMRC

The return code

To run the macro interface, the STEPLIB statement in the CA 7 started task JCL must be concatenated in the CA NetMaster started tasks JCL. Following is an example:

```
//STEPLIB DD DSN=dsnpref.pvpref.MS.CC2DLOAD,
//        DD DISP=SHR,DSN=CD.Vnnnn.LINKLIB
//        DD DISP=SHR,DSN=dsnpref.CA7Vnn.CAILIB
//        DD DSN=SYS1.SISTCLIB,DISP=SHR
```

SMFWRITE Macro

The SMFWRITE macro writes a user-defined SMF record (SMS record on VOS3 systems).

Parameters: SMFWRITE Macro

Test Mode

Can be used to test the macro.

If the test mode is OFF, the macro writes the specified record to the SMF (or SMS) data set. If the test mode is ON, the macro sends the specified record to the activity log.

Subtype

Specifies the record subtype. The 9*xxx* subtypes are reserved for these user-defined records.

Enter a hexadecimal value. The subtype is constructed by prefixing the specified value with 9.

SMF Data

Specifies the data in each field of the record. This field may contain constant or variable data (data contained in variables).

Length

Specifies the length of a data field in bytes.

Example: SMFWRITE Macro

In the following example, the SMFWRITE macro writes a record that indicates when a service starts.

```
--------- Automation Services : SMFWRITE Macro Parameter Definition -----------
Command ===>                                                  Function=BROWSE

.- SMF Parameters ------------------------------------------------------------.
|                                                                             |
| Test Mode ... OFF                                                           |
| Subtype ..... FFF                                                           |
|                                                                             |
|   SMF Data                                                        Length    |
|   START                                                             6       |
|   &SERVICE                                                          12      |
```

SNMPTRAP Macro

The SNMPTRAP macro generates an SNMP trap. You can use an SNMP trap to inform a remote system of a resource or service state change.

Parameters: SNMPTRAP Macro

Text

Specifies the text to send with the trap. The format of the text should conform to the specified enterprise ID and specific trap number.

Destinations Dataset

Specifies the data set name (DSN) in which the addresses of remote systems are located.

Destination Address(es)

Specifies the destination addresses of the remote systems. You can enter an address, or multiple addresses by using a comma or a space as the delimiting character.

Enterprise ID

Together with the specific trap number, specifies the format of the trap. The format identified by this field is determined by your open platform administration.

Specific Trap Number

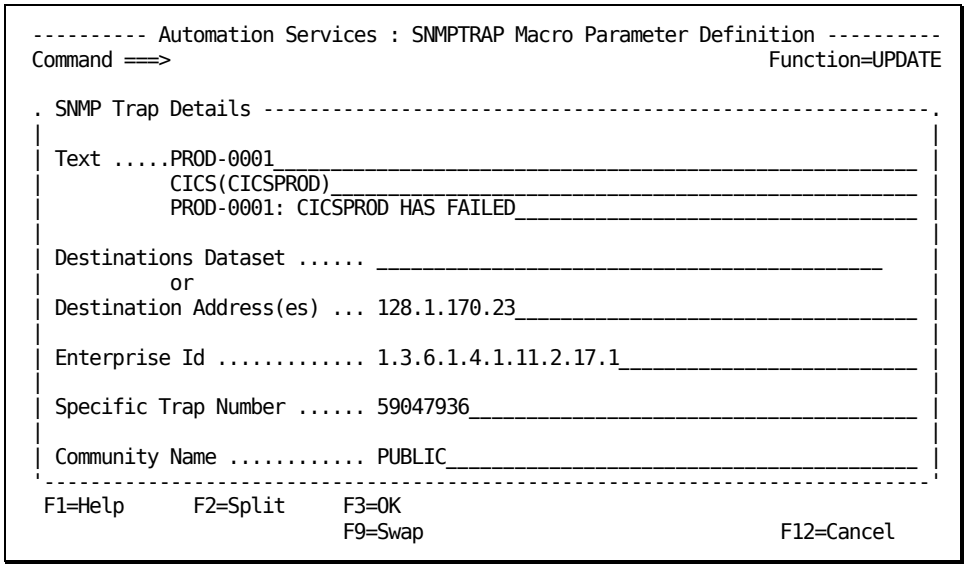
Together with the enterprise ID, specify the format of the trap. The format identified by this field is determined by your open platform administration.

Community Name

Specify the community for which the trap is destined. This field is **case sensitive** and can be left with its default of public.

Example: SNMPTRAP Macro

In the following example, the SNMPTRAP macro sends a trap to the remote system at the specified address when the CICS task is lost. The macro is specified in a process definition that is used by the resource definition for the task (CICSPROD) and processed as an exit upon receipt of a message which indicated that the CICS region has failed.



SOCKCLSE Macro

The SOCKCLSE macro closes the socket connection, which was opened using the SOCKCONN macro.

Parameters: SOCKCLSE Macro

The SOCKCLSE macro does not have any parameters. There can be one open connection only and this is the one that is closed.

SOCKCONN Macro

The SOCKCONN macro establishes a socket connection with an IP address. It is used to determine the availability of a connection.

Parameters: SOCKCONN Macro

IP Address/Host Name

Specifies the IP address or host name of the application to which you want to connect.

Port Number

Specifies the port number of the application to which you want to connect.

Wait for Connection

Specifies the time (in seconds) that you want to try to establish the connection.

Example: SOCKCONN Macro

In the following example, the SOCKCONN macro is used to connect to port number 435 at IP address 172.31.255.255. The system will wait 10 seconds for the connection.

```
--------- Automation Services : SOCKCONN Macro Parameter Definition -----------
Command ===>                                                  Function=UPDATE

. Socket Details ------------------------------------------------------------.
|                                                                            |
|  Specify the parameters for SOCKET CONNECT:                                |
|                                                                            |
|    IP Address/Host Name ... 172.31.255.255_____________________________    |
|                                                                            |
|    Port Number ............ 435__  (0 - 65535)                            |
|                                                                            |
|    Wait for Connection .... 10_    (In seconds)                            |
|                                                                            |
'----------------------------------------------------------------------------'









 F1=Help      F2=Split     F3=OK
                           F9=Swap                              F12=Cancel
```

SOCKRECV Macro

The SOCKRECV macro receives data (via the established socket connection) from an IP application. It is used to determine the health of an application. You can specify up to three different data streams, which can then set three different return codes.

Parameters: SOCKRECV Macro

Expected Data Format

Specifies the format in which you want to receive the data. You can choose either ASCII or EBCDIC.

Wait Time

Specifies the time (in seconds) that you want to wait to receive the data.

RC

Specifies the return code for the data.

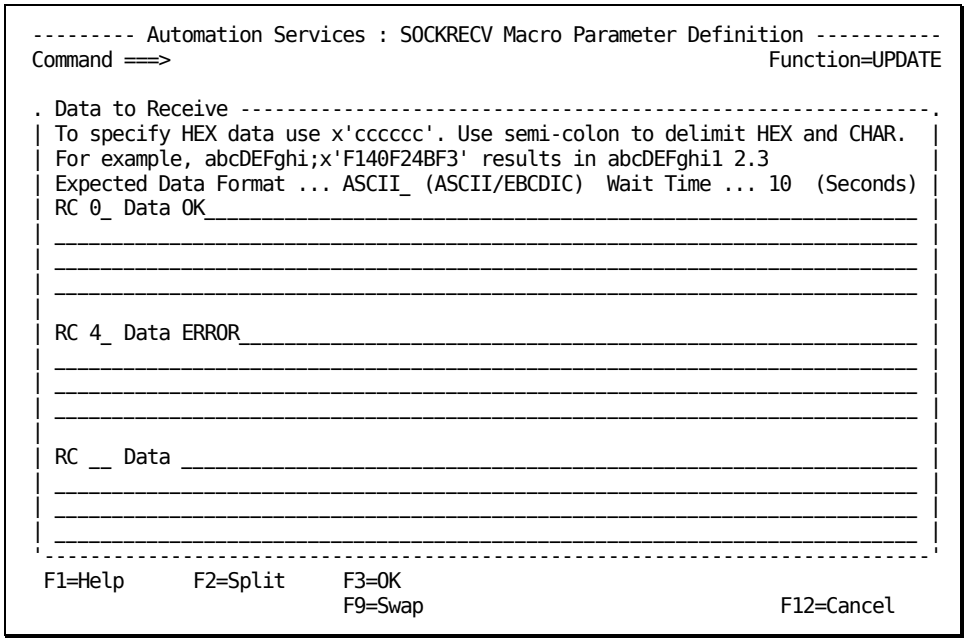
Data

Specifies the data that you want returned.

Unprintable characters, for example hexadecimal, can be entered by preceding the command with **x'** and ending it with **'**. For example, x'456703'. The data must also be separated from text with a semicolon (;).

Example: SOCKRECV Macro

In the following example, the SOCKRECV macro receives data from the open socket connection. If OK is received, a code of 0 is returned; if ERROR is received, a code of 4 is returned. The data is returned in ASCII format and the system waits 10 seconds for a response.



SOCKSEND Macro

The SOCKSEND macro sends data (via the established socket connection) to an IP application. It is used to determine the health of an application.

Parameters: SOCKSEND Macro

Data Format

Specifies the format in which you want to send the data. You can choose either ASCII or EBCDIC.

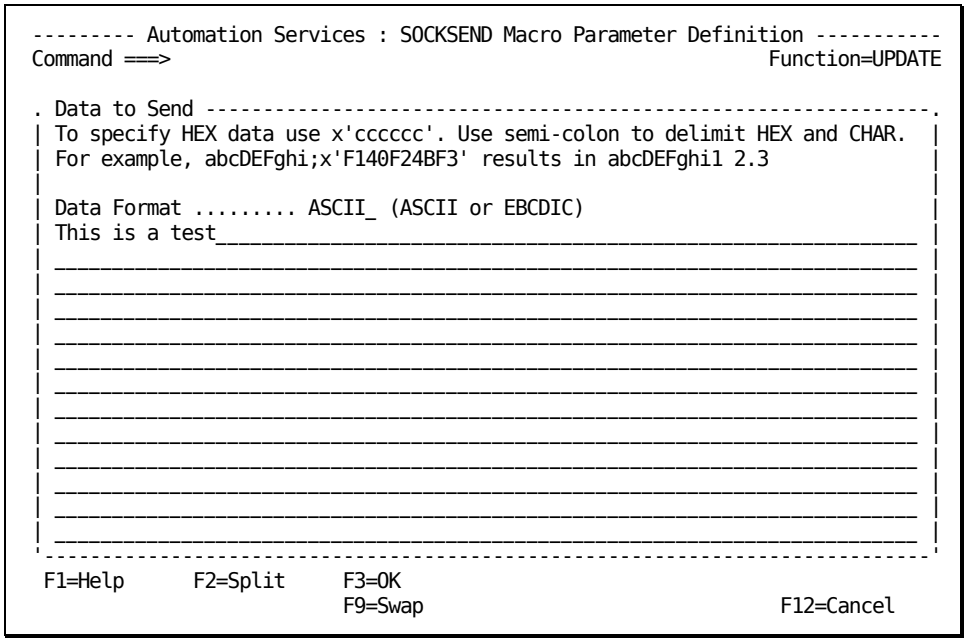
Data

Specifies the data you want to send.

Unprintable characters, for example hexadecimal, can be entered by preceding the command with **x'** and ending it with **'**. For example, x'456703'. The data must also be separated from text with a semicolon (;).

Example: SOCKSEND Macro

In the following example, the SOCKSEND macro sends the data 'This is a test' in ASCII format to the IP address with the open socket connection.



STARTNCL Macro

The STARTNCL macro starts an NCL procedure that runs independently of the process.

Parameters: STARTNCL Macro

NCL Name

Specifies the name of the NCL procedure you want to start.

Region

Identifies the region in which the specified NCL procedure is to start. The field must be blank or contain one of the following background environments:

- AOMP
- BLOG
- BMON
- BSYS
- CNMP
- LOGP
- PPOP

If this field is blank, the current region is assumed.

Parameters

Specifies the parameters (and their values) required by the NCL procedure specified in the NCL name field.

Segment Multi-word Parameter Variables

Specifies whether to pass a string of words in a variable as multiple parameters to the procedure.

Example: STARTNCL Macro

In the following example, the STARTNCL macro starts the CALC2 NCL procedure which contains the &MULT variable. The procedure is started in the current region.

```
PROD----- Automation Services : STARTNCL Macro Parameter Definition -----------
Command ===>                                                  Function=BROWSE

.- NCL Procedure Details ------------------------------------------------------.
|                                                                              |
|  NCL Name .... CALC2                                                         |
|                                                                              |
|  Region .....+           (AOMP, BLOG, BMON, BSYS, CNMP, LOGP or PPOP)        |
|                                                                              |
|  Parameters .. MULT=365                                                      |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|  Segment Multi-word Parameter Variables ... NO     (YES or NO)               |
```

STOP Macro

The STOP macro stops a process after setting the return code.

Parameters: STOP Macro

Return Code

Lets you set the process return code.

Limits: A numeric value from 0 through 99.

Example: STOP Macro

In the following example, the return code for the STOP macro is set to 0.

```
PROD------ Automation Services : STOP Macro Parameter Definition --------------
Command ===>                                                    Function=BROWSE

.- Return Code ------------------------------------------------------------.
|                                                                           |
|  Return Code .... 0   (Enter a number between 0 and 99)                   |
|                                                                           |
'---------------------------------------------------------------------------'
```

SUBJOB Macro

The SUBJOB macro submits a JCL batch job.

Parameters: SUBJOB Macro

Dataset Name

Specifies a mandatory field that specifies the data set member that contains the job steps.

This field can contain a sequential data set.

Wait Time

Specifies the maximum time, in seconds, that the region waits for a response message. The time is reset each time a response is received. The macro waits until a message that matches a rule in the Message Text fields is received or until the time expires without receiving any more responses.

Limits: 1 to 9999.

Default: 30

Wait Time Expiry Return Code

Specifies the value of the macro return code if the expected message does not arrive before the expiry of the time specified in the Wait Time field.

Limits: 1 to 999.

Default: 69

Message Text

Specifies the initial part of the required response message. The text can contain up to 45 characters.

Return Code

Specifies the value set by the macro when it receives the response message.

Limits: 0 to 999.

Extended Filter?

Indicates whether an extended filter has been defined. This field is empty until you complete the Message Text and Return Code fields. If you want to define an extended filter, enter **S** to access the Extended Message Filtering panel.

After this panel is completed, the Extended Filter field is updated automatically.

Returned Variables: SUBJOB Macro

&$RMMCMSGTEXT

Contains the full text of the message that satisfies the message rules.

&$RMMCWORD*n*

Contains the words in the message, where *n* indicates the position of the word in the message.

&ZRMMSG*n*

Contains any messages received before the required response message, where *n* is a number indicating the order in which those messages are received.

&$RMMCWTORID

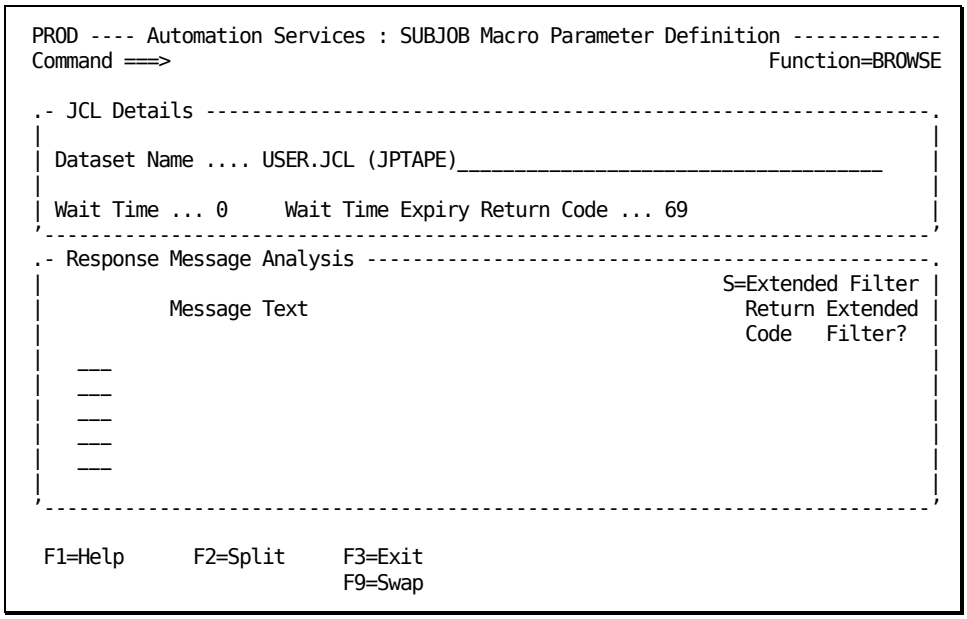
Contains the ID of the last encountered WTOR message if the macro encounters any WTOR messages before it encounters an expected message.

For example, if the response to a command consists of three messages A, B, and C, and message B satisfies the message rules, then:

- &ZRMMSG1 contains message A
- &$RMMCMSGTEXT contains message B
- The macro ends on receipt of message B and does not see message C

Example: SUBJOB Macro

In the following example, the name of the data set member that contains the job steps is USER.JCL (JPTAPE).



SUBPRCSS Macro

The SUBPRCSS macro submits another process to a region. The process runs separately from the current process—that is, *not* in line with the current process.

Parameters: SUBPRCSS Macro

Process

Specifies the name of the process you want to start.

Region

Identifies the owner of the processing region in which the process is to start. In this case, the owner is a background user and must be one of:

- AOMP
- BLOG
- BMON
- BSYS
- CNMP
- LOGP
- PPOP

This is a mandatory field.

Log

Indicates the way in which you want the process activity logged to the activity log. The value of this field must be one of the following:

- NO (no log)
- FULL (full log)
- SUMM (summary log)
- BOTH (both full and summary logs)

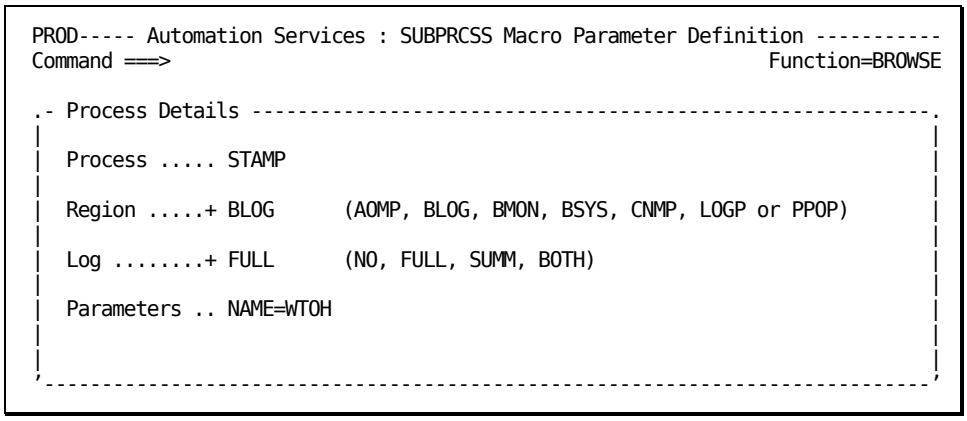
If this field is not completed, the default value of NO is assumed.

Parameters

Specifies the parameters (and their values) required by the specified process.

Example: SUBPRCSS Macro

In the following example, the process STAMP runs in the BLOG environment. The activities of STAMP are fully logged. STAMP contains the &NAME variable, which is defined as WTOH.



SVAPI Macro

The SVAPI macro executes the $RMCALL API. The macro inherits the $RMCALL return code.

Parameters: SVAPI Macro

Opt

Refers to the requested option and is automatically set to SERVICE.

Service

Refers to the requested SERVICE and is automatically set to ACTION.

Action

Mandatory field that identifies the type of processing required. The value of this field must be one of the following:

- COMMAND issues an Automation Services command.
- DBGET retrieves the definition of a resource or service specified by the SysName, Version, Class, and Name fields. The information is stored in the &ZRMDB prefixed variables.
- STGET retrieves the current status of the resource or service specified by the SysName, Version, Class and Name fields. The information is stored in the &ZRMST prefixed variables.

Command

Identifies the required command if the value of the Action field is COMMAND.

SysName

Identifies the system image in which to perform the action. If this field is not completed, the current system image is assumed by default.

Version

Identifies the version of the system image in which to perform the action. If this field is not completed, the current system image is assumed by default.

Class

Identifies the resource or service class.

Name

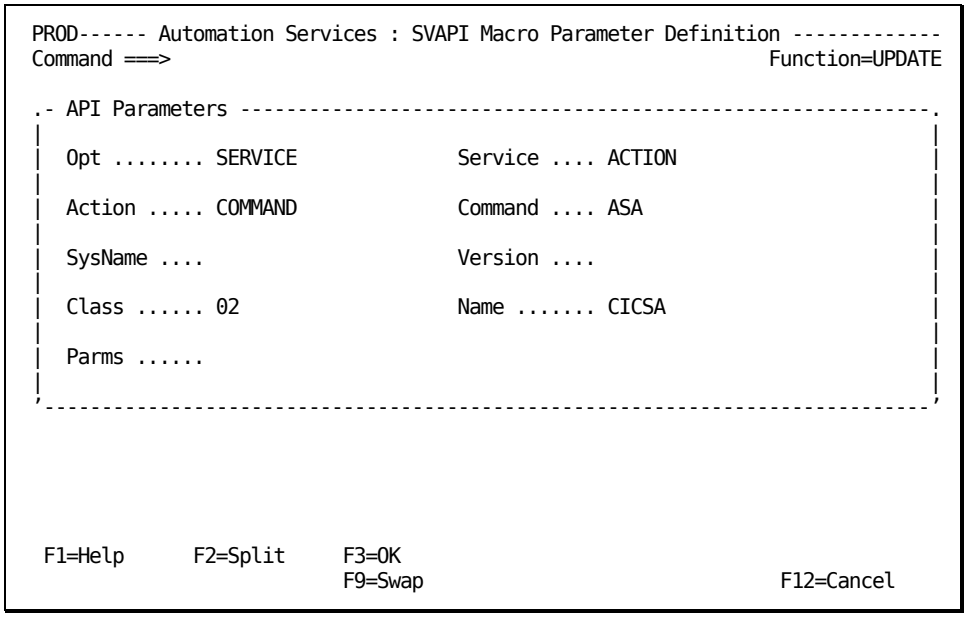
Identifies the resource or service.

Parms

Specifies the parameters required by the command specified in the Command field.

Example: SVAPI Macro

In the following example, the macro sets the actual state of the local CICSA resource to ACTIVE.



SVCMD Macro

The SVCMD macro issues a registered Automation Services command. The macro inherits the $RMCALL return code.

Parameters: SVCMD Macro

Command Name

A mandatory field that specifies the name of the registered command issued by the SVCMD macro.

To display a full list of registered commands, enter **?**.

Parameters

Specifies the parameters passed to the specified command.

Example: SVCMD Macro

The following example issues the T (Terminate) command for the local resource named in &NAME.

```
PROD------ Automation Services : SVCMD Macro Parameter Definition -------------
Command ===>                                                    Function=BROWSE

.- Command Details ------------------------------------------------------------.
|                                                                              |
|  Command Name  T                                                             |
|                                                                              |
|  Parameters .. SYSNAME=&ZRMSYSNAME VERSION=&ZRMVERSION CLASS=17              |
|                NAME=&NAME                                                    |
```

SYSCMD Macro

The SYSCMD macro issues a system command and interprets the results. You can specify message rules to detect the required response message.

Parameters: SYSCMD Macro

Command

Specifies the system command issued by the SYSCMD macro.

The command follows the syntax of the SYSCMD command.

Jobname

Lets you limit the response messages to those responses from the specified job.

Wait Time

Specifies the maximum time, in seconds, that the region waits for a response message. The time is reset each time a response is received. The macro waits until a message that matches a rule in the Message Text fields is received or until the time expires without receiving any more responses.

Limits: A number from 1 through 9999.

Default: 30

Wait Time Expiry Return Code

Specifies the value of the macro return code if the expected message does not arrive before the expiry of the time specified in the Wait Time field.

Limits: A number from 1 through 999.

Default: 69

Message Text

Specifies the initial part of the required response message.

Limits: Up to 45 characters.

Return Code

Specifies the value set by the macro when it receives the response message.

Limits: A number from 0 through 999.

Extended Filter?

Indicates whether an extended filter has been defined. This field is empty until you complete the Message Text and Return Code fields. If you want to define an extended filter, enter S to access the Extended Message Filtering panel.

After this panel is completed, the Extended Filter field is updated automatically.

Returned Variables: SYSCMD Macro

&$RMMCMSGTEXT

Contains the full text of the message that satisfies the message rules.

&$RMMCWORD*n*

Contains the words in the message, where *n* indicates the position of the word in the message.

&ZRMMSG*n*

Contain any messages received before the required response message, where *n* is a number indicating the order in which those messages are received.

&$RMMCWTORID

Contains the ID of the last encountered WTOR message if the macro encounters any WTOR messages before it encounters an expected message.

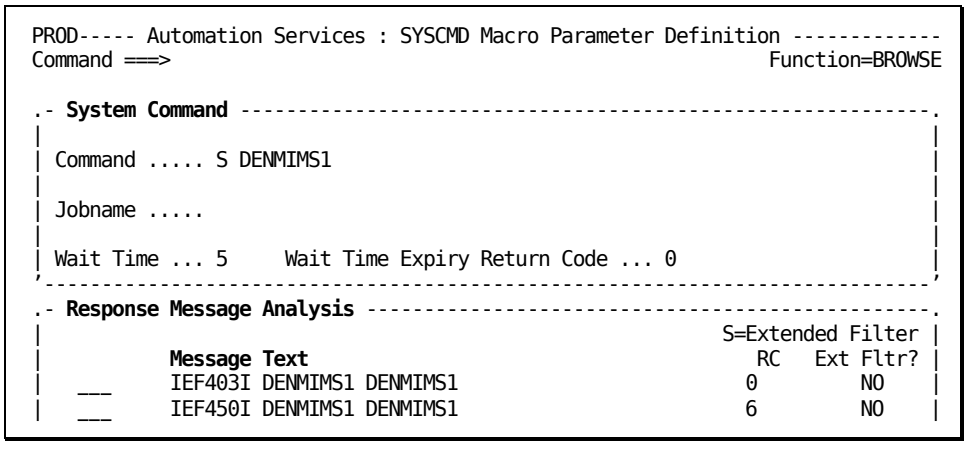
For example, if the response to a command consists of three messages A, B, and C, and message B satisfies the message rules, then:

- &ZRMMSG1 contains message A
- &$RMMCMSGTEXT contains message B
- The macro ends on receipt of message B, and does not see message C

Example: SYSCMD Macro

In the following example, the SYSCMD macro issues the S DENMIMS1 command and awaits a specified response.

No extended filter has been defined in this example.



TRANS Macro

The TRANS macro changes all occurrences of a set of characters in a text string into another set of characters.

Parameters: TRANS Macro

From

Specifies the list of characters you want to translate (replace). You must specify at least one character in this list.

To

Specifies the list of corresponding replacement characters.

String to be Translated-Input

Specifies the string that contains the characters you want translated.

The field is mandatory, and the entry may contain one or more variables. Translation occurs after the variables are substituted by their values.

Variable to hold Translated String-Output

Specifies the name of the variable to hold the translated string.

This is a mandatory field.

Example: TRANS Macro

In the following example, the TRANS macro examines the Input string:

```
AAA BBB CCC DDD EEE FFF GGG HHH
```

All occurrences of the specified characters are translated so that the result is:

```
111 222 333 444 555 FFF GGG HHH
```

This string is held in the variable &FRED1.

```
PROD------ Automation Services : TRANS Macro Parameter Definition -------------
Command ===>                                                  Function=BROWSE

.- What to Translate ------------------------------------------------------.
|                                                                           |
| From ..... A    To ....... 1   (All occurrences of the From character(s)  |
|      ..... B       ....... 2   in the Input string will be translated to  |
|      ..... C       ....... 3   the corresponding To character(s), and the |
|      ..... D       ....... 4   result will be stored in the Output string)|
|      ..... E       ....... 5                                              |
'---------------------------------------------------------------------------'

.- String to be Translated ------------------------------------------------.
|                                                                           |
| Input .... AAA BBB CCC DDD EEE FFF GGG HHH                                |
|           (Text String or Variable(s))                                    |
'---------------------------------------------------------------------------'

.- Variable to hold Translated String -------------------------------------.
|                                                                           |
| Output ... FRED1        (Variable Name)                                   |
'---------------------------------------------------------------------------'
 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

WAIT Macro

The WAIT macro instructs a process to wait for a specified period before executing the next step in the process.

Parameters: WAIT Macro

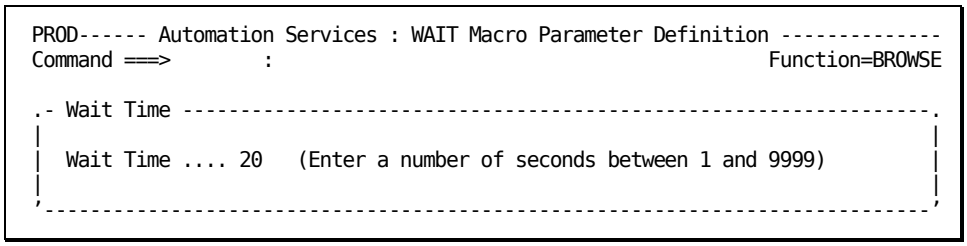
Wait Time

A mandatory field that lets you specify the length of time (in seconds) that the process is to wait before proceeding.

Limits: A number from 1 through 9999.

Example: WAIT Macro

In the following example, the WAIT macro instructs the process to wait 20 seconds before proceeding.



WAITEVNT Macro

The WAITEVNT macro waits for an N00102 event message.

Parameters: WAITEVNT Macro

Note: You can use the asterisk (*) as wild cards in the Name, Object, Resource, and Reference fields. A leading or embedded * represents a single character; a trailing * represents zero or more characters.

Name

Lets you use the name of the event as a criterion to select the event to wait for.

Type

Lets you use the type of event as a criterion to select the event to wait for. Valid values are as follows:

ALL

Selects events irrespective of their contents.

APPLICATION

Selects events that contain user-defined information.

ACCESS

Selects events that contain security alarm information.

CONFIGURATION

Selects events that contain object definition and relationship information.

PROCEDURAL

Selects events that contain scheduling and process control information.

SERVICEABILITY

Selects events that contain availability, degradation, error, fault, and recovery information.

UTILIZATION

Select events that contain accounting, performance, response time, and statistics information.

Scope

Lets you use the scope of delivery of the event as a criterion to select the event to wait for. Valid values are as follows:

REGION

Selects events that are delivered to processes within the region of the event issuer only.

SYSTEM

Selects events that are delivered to processes within the entire region.

Object

Lets you use the object class as a criterion to select the event to wait for.

Resource

Lets you use the name of the resource or resource pair (separated by a comma) for which the event is issued as a criterion to select the event to wait for.

Reference

Lets you use the reference code for the event as a criterion to select the event to wait for.

Wait Time

Specifies how long the macro can wait for an event that satisfies the specified criteria.

Return Codes: WAITEVNT Macro

0

Event message received.

4

Event message not received within the specified time.

Returned Variables: WAITEVNT Macro

&$RMMCEVENT1 through &$RMMCEVENT12

Contains the N00102 event message. The number of variables that contain value depends on the length of the message. Each variable can hold up to 256 bytes.

&$RMMCEVNAME

Contains the name of the event.

&$RMMCEVTYPE

Contains the type of the information in the event.

&$RMMCEVSCOPE

Contains the scope of delivery of the event.

&$RMMCEVOBJ

Contains the object class for the resource or resource pair for which the event is issued.

&$RMMCEVRES

Contains the name of the resource or resource pair for which the event is issued.

&$RMMCEVREF

Contains the reference code for the event.

&$RMMCEVDATA

Contains the part of data that is in the &$RMMCEVENT1 variable. If the data overflows into the other &$RMMCEVENT*n* variables, you can obtain all the data by concatenating the value in those variables to the value in this variable.

Example: WAITEVNT Macro

In the following example, the WAITEVNT macro waits for an event with a name that starts with OPERATIONS, and of the specified type and scope. The wait time period is 100 seconds.

```
PROD----- Automation Services : WAITEVNT Macro Parameter Definition -----------
Command ===>                                                  Function=BROWSE

.- Event Parameters ------------------------------------------------------------.
|                                                                               |
| Name......... OPERATIONS*                                                    |
|                                                                               |
| Type........+ SERVICEABILITY                                                 |
| Scope.......+ SYSTEM                                                         |
|                                                                               |
| Object.......                                                                |
| (Blanks will be translated to underscores)                                    |
|                                                                               |
| Resource.....                                                                |
| Reference....                                                                |
|                                                                               |
| Wait Time ... 100 (0 - 9999, Blank = Wait Forever)                           |
```

WAITSTAT Macro

The WAITSTAT macro waits for a specific resource or service state change and retrieves the status.

Parameters: WAITSTAT Macro

System Name/Version

Identifies the system image that owns the resource. If you do not specify an image, then during execution, the macro uses the following values:

If the macro is associated with a resource definition, the macro uses the image that owns the definition.

If the macro is not associated with a resource definition (for example, in an EventView rule), the macro uses the active local image.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Resource Class

Specifies the class name of the resource or service for which you want to detect the state change. This field can be completed manually, by entering the appropriate valid value, or automatically by selecting from the prompted field value list. To display the list, type **?** in the Resource Class field.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Resource Name

Specifies the name of the resource or service for which you want to detect the state change.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

State Type

Specifies whether the specified state change applies to the actual state, desired state, or the logical state. This field can be completed manually, by entering the appropriate valid type of state, or automatically by selecting from the prompted field value list. To display the list, type **?** in the State Type field.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Transition From State

Specifies the required state before the change. You can specify ANY to detect state changes from any state of the specified type. This field can be completed manually by entering the appropriate valid state, or automatically by selecting from the prompted field value list. To display the list, type **?** in the From State field.

If the current state does not satisfy this value, the macro cannot be processed and the return code is set to 8.

The values listed in the prompted field value list will vary depending on the value of the State Type field.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Transition To State

Specifies the required state after the change. This field can be completed manually by entering the appropriate valid state, or automatically by selecting from the prompted field value list. To display the list, type **?** in the To State field.

The values listed in the prompted field value list will vary depending on the value of the State Type field.

If the value of the From State field is ANY and the current state satisfies this value, the state change condition is deemed to be satisfied and the status is retrieved.

Note: You can specify a variable name in this field (for example, &VALUE) that resolves if passed as a parameter to this macro when executed.

Timeout Period

Specifies the maximum time in seconds that can elapse while waiting for the state change. After the specified time has expired, the return code is set to the value specified in the Return Code field.

Return Code

Specifies the return code to set if timeout occurs.

Limits: A number from 0 through 99. Do not specify 8 as the return code.

Variable Prefix

Specifies the prefix of the variables that contain the retrieved status information. The prefix lets you store the status information retrieved at different times in different variables.

The information is retrieved from the &ZRMST prefixed status variables when the specified state change is detected. The retrieved information is stored in a corresponding set of variables, with the ZRMST prefix replaced by the specified prefix, prefix. For example, the information retrieved from the &ZRMSTACTSTAT variable is stored in the &prefixACTSTAT variable.

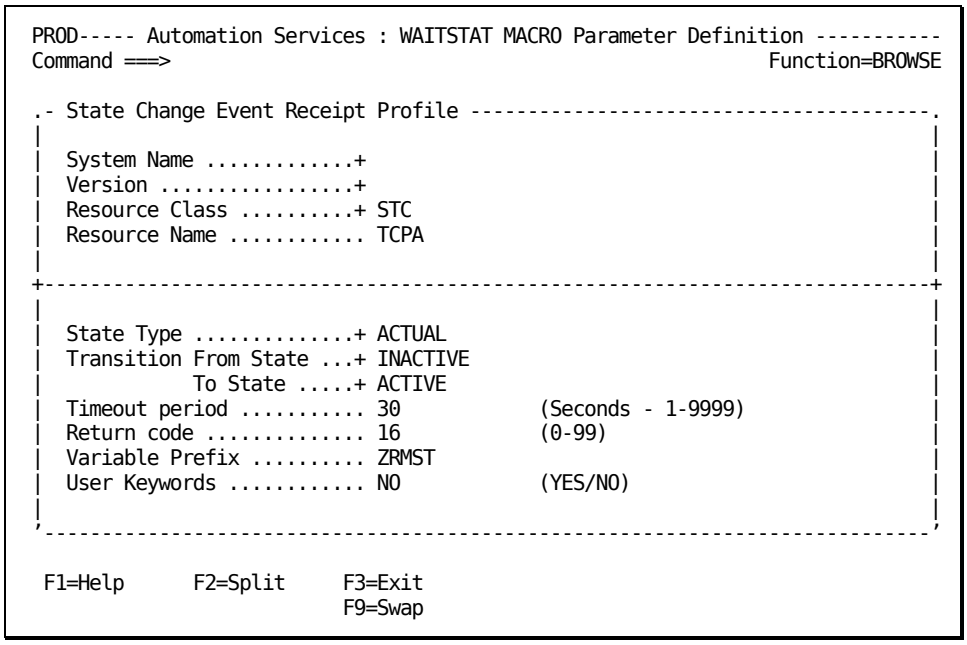
The prefix must not start with one of the following characters: # or $.

User Keywords

Lets you store the keyword that is specified in the User Defined Keyword field on the Define Extended Display Attribute panel of a triggered message rule in a resource definition. The keyword is stored in the &prefixUSRKEYW variable.

Example: WAITSTAT Macro

In the following example, you want to detect a change in the actual state of the resource TCPA from INACTIVE to ACTIVE. If the change is not detected within 30 seconds, the process sets the return code to 16. A variable prefix of ZRMST has been specified.



WTO Macro

The WTO macro sends a WTO message to local system consoles.

WTO Text

Specifies the WTO message to send.

Descriptor Codes

Specifies the descriptor codes assigned to the message. The value can be a single code, or a list of codes and code ranges (for example, 1,8-12).

Routing Codes

Specifies the routing codes assigned to the message. The value can be a single code, or a list of codes and code ranges (for example, 1,8-12).

Example: WTO Macro

In the following example, you send a message to consoles profiled for routing codes 1, 2, and 11 to indicate that the region is now managing systems network operations.

```
PROD-------- Automation Services : WTO Macro Parameter Definition -------------
Command ===                                                    Function=BROWSE

.- WTO Details ------------------------------------------------------------.
|                                                                           |
| WTO Text... THE REGION IS NOW MANAGING SYSTEM OPERATIONS.                 |
|                                                                           |
|                                                                           |
| Descriptor Codes...                                                       |
|                                                                           |
| Routing Codes...... 1,2,11                                                |
```

WTOR Macro

The WTOR macro sends a WTOR message to all local system consoles and waits for the reply.

Parameters: WTOR Macro

WTOR Text

Specifies the WTOR message to send.

Reply Match Text

Specifies the replies to look for. You can specify up to five reply text versions (rules), each setting a specific value for the macro return code. Specify enough text to positively identify each version. You can use the asterisk (*) as the wildcard character in the reply text.

R/Code

Specifies the value to set for the return code if a reply satisfying the rule in the Reply Match Text field is received. Use different values to differentiate between the different replies. The macro return code thus indicates the type of reply received.

Store Actual Reply Text in Variable Name

Specifies the name of the variable in which to put the received reply.

Wait Time

Specifies the number of seconds to wait for a reply that satisfies one of the rules in the Reply Match Text field. If the specified time expires, the WTOR message is canceled and the return code is set to the value specified in the Wait Time Expiry Return Code field.

Wait Time Expiry Return Code

Specifies the value to set for the return code if no valid reply is received within the specified time.

Example: WTOR Macro

In the following example, you want to find out whether one of five specified users has logged on to a console.

```
PROD----- Automation Services : WTOR Issue MACRO Parameter Definition ---------
Command ===                                                    Function=BROWSE

.- WTOR Text To Be Issued ------------------------------------------------------.
|                                                                               |
| WTOR Text... WHAT IS YOUR USER ID?                                            |
|                                                                               |
'-------------------------------------------------------------------------------'
.- Response Text Analysis ------------------------------------------------------.
|                                                                               |
|             Reply Match Text                                R/Code            |
|             USER01                                          10                |
|             USER02                                          20                |
|             USER03                                          30                |
|             USER04                                          40                |
|             USER05                                          50                |
|                                                                               |
|             Store Actual Reply Text in Variable Name  REPLYTEXT               |
|                                                                               |
|             Wait Time 120   Wait Time Expiry Return Code 32                   |
'-------------------------------------------------------------------------------'

 F1=Help      F2=Split     F3=Exit
                           F9=Swap
```

Appendix M: Data Set Descriptions

This section contains the following topics:

Data Set Types

The data sets are of the following types:

Distribution

Consists of SMP distribution libraries that are used during the installation and maintenance of a product, for example, *dsnpref*.OPB9.*ccdsname*.

Local PDS

Consists of run-time PDS files that are allocated during setup for use by an active region, and cannot be shared between multiple regions, for example, *dsnpref.rname.dsname*.

Local Sequential

Consists of run-time sequential files that are allocated during setup for use by an active region, and cannot be shared between multiple regions, for example, *dsnpref.rname.dsname.*

Local VSAM

Consists of run-time VSAM files that are allocated during setup for use by an active region, and cannot be shared between multiple regions, for example, *dsnpref.rname.dsname*.

Other PDS

Consists of shared non-VSAM PDS created separately to this product.

Run-time PDS

Consists of shared non-VSAM SMP target files that are allocated during installation and used by an active region, for example, *dsnpref*.OPB9.*ccdsname*.

Run-time PDS (external)

Consists of shared non-VSAM SMP target libraries that are not used by a region.

Run-time PDSE

Consists of shared non-VSAM SMP target files that are allocated during installation and used by an active region, for example, *dsnpref*.OPB9.*ccdsname*. Program objects that must be executed from a PDSE are stored in these files.

Shared PDS

Consists of run-time PDS files that are allocated during setup for use by an active region, and can be shared between multiple regions, for example, *dsnpref.*OPB9.*dsname*.

Shared run-time VSAM (MODSDIS, NETINFO, NSCNTL, PANLDIS, OSCNTL, and UAMS)

Consists of files identified by the unique data set prefixes you enter when you set up your regions. You can choose to select a data set prefix for each file. You can make the data set prefix the same or different from those prefixes you have used for other files.

Active regions can share these run-time files.

VSAM data sets that can be shared in this manner are defined using SHAREOPTIONS(3,3).

Staging

Consists of shared non-VSAM files that are used during the installation process to store sequential copies of files including the product panels, MODS, and OSCNTL files, for example, *dsnpref*.OPB9.*ccdsname*.S. These sequential copies are then merged to create the run-time files. If you intend to create additional regions at a later date, you can use the staging files as input to the setup process.

TESTEXEC

Is a file identified by the unique data set prefix you enter when you set up your region.

Product Components

Your product operates with a combination of common and product-specific components.

The installation process and these components have data set requirements.

Installation

Product installation uses the following data sets:

***dsnpref.*OPB9.INSTDB**

Stores your site-specific installation values, which can be reused in future installations of products in the same suite. The installation software allocates this data set the first time you perform an installation. The setup and maintenance software also uses this data set.

***dsnpref.*OPB9.INSTALL.JCL**

Stores the generated product installation JCL members.

After the installation software has collected your site-specific installation values, it generates the installation JCL.

Before you generate the JCL, specify the library where you want to store the generated JCL. INSTALL.JCL is the default JCL library.

Use an empty data set each time you perform the installation. This process ensures that the jobs in your JCL library are the only ones required for the current installation.

***dsnpref.*OPB9.*rname*.JCL**

***dsnpref.*OPB9.*ssiname*.JCL**

Stores the setup jobs, including the members that contain the execution JCL statements required to run the product components.

After the setup software has collected the setup values for your region or SOLVE SSI, it generates the setup JCL.

***dsnpref*.OPB9.VTAM.JCL**

Stores the generated VTAM major node and JCL to assemble mode tables.

After the Create VTAM Definitions software has collected your values, it generates the JCL.

***dsnpref.*OPB9.FIX.SP*n*.JCL**

***dsnpref.*OPB9.FIX.DASD.JCL**

***dsnpref*.OPB9.FIX.WEBCENTR.JCL**

Stores the maintenance jobs that you run to apply maintenance to your installed products.

After the maintenance software has collected your maintenance values, it generates maintenance JCL.

Management Services Data Sets

Management Services has the following data sets:

AC2DEXEC

Is the SMP DLIB that contains the same distributed NCL procedures as the CC2DEXEC run-time library.

Type: Distribution

AC2DJCL

Is the SMP DLIB that contains the same members as the CAIJCL installation data set.

Type: Distribution

AC2DMAC

Is the SMP DLIB that contains the same information as the CC2DMAC library.

Type: Distribution

AC2DMOD

Is the SMP DLIB that contains the modules used by SMP to build the load modules in the run-time LOAD libraries.

Type: Distribution

AC2DSAMP

Is the SMP DLIB that contains the same information as the CC2DSAMP library.

Type: Distribution

AC2DVSMI

Is the SMP DLIB that contains the same information as the CC2DVSMI library.

Type: Distribution

AC2DXML

Is the SMP DLIB contains the same information as the CC2DXML library.

Type: Distribution

ALERTH

Is part of the Alert Monitor and enables you to view alerts that have been created in the past. Alerts in the history file can contain notes showing manual and automated actions that were performed for the alert.

Type: Local VSAM

Run-time DDname: ALERTH

CC2DEXEC

Is the PDS that contains distributed NCL procedures and is concatenated after the TESTEXEC data set in DD COMMANDS. Collectively these data sets make up the procedure library.

Members in CC2DEXEC must not be changed.

Important! If modifications are required, copy the distributed member to the TESTEXEC data set for the region for modification.

Type: Run-time PDS (external)

Run-time DDName: COMMANDS

CC2DJCL

Is the PDS that contains the installation and maintenance JCL members.

Type: Run-time PDS

CC2DLINK

Is a PDS run-time load library that contains various NetView exits. Include in the STEPLIB DD concatenation for NetView if you are using the NVC component.

If your auditors want CA Auditor Product Descriptor Module (PDM) to know of your product running on your system, include this library in the system LNKLST.

Type: Run-time PDS

CC2DLMD0

Is the PDS into which the TSO interface load modules are linked during installation.

Type: Run-time PDS (external)

Run-time DDName: STEPLIB (TSO)

CC2DLOAD

Is the load library. This load library must be APF-authorized. This means that the run-time load library, as referenced by the STEPLIB DD statement, must be defined in the operating system APF list. If no STEPLIB DD statement is used, the program load modules must reside in one of the existing authorized LNKLST libraries. Ensure that these requirements are met before attempting to start your region.

You can install your product into its own installation load library and copy the load modules across to the system load library.

The library also contains the CA Datacom load modules for ReportCenter.

Type: Run-time PDS

Run-time DDName: STEPLIB

CC2DLPA

Is a separate PDS run-time load library containing modules that must be executed from the LPA. The data set contains only CNMNETM plus its aliases.

Type: Run-time PDS

CC2DMAC

Is the PDS that contains macros and copybooks for the sample assembler programs, which are also distributed in source form in the AC2DMAC library.

Type: Run-time PDS (external)

CC2DSAMP

Is the PDS that contains various sample exits, utilities, source code, and JCL members. The members contain documentation.

Type: Run-time PDS (external)

CC2DVSMI

Is the interim staging data set to which MODS, OSCNTL, PANEL, NETINFO, ICOPANL, and RAMDB files are unloaded. They are later copied to the run-time MODSDIS, OSCNTL, PANLDIS, NETINFO, ICOPANL, and RAMDB files.

Type: Staging

CC2DXML

Is the PDS that contains the XML data used by CA MSM.

Type: Run-time PDS (external)

FMTDUMP

Is the data set the region uses for a formatted dump.

Type: SYSOUT

Run-time DDName: FMTDUMP

LOG

Is the data set the region uses for the hardcopy log.

Type: SYSOUT

Run-time DDNames: LOG1 through LOG9

MODSDIS

Is the VSAM data set that contains the MODS database. The region uses the MODS database for control information for processing. The database includes standard message information, online help text, menus, Print Services Manager (PSM) definitions, and Report Writer definitions.

Type: Shared run-time VSAM

Run-time DDName: MODSDIS

Note: For information about the allocation and usage of MODS databases, see the *Managed Object Development Services Guide*.

MODSUSR

Is a data set that has the same functions as MODSDIS and is intended for your own records. You can have separate records for test and production environments.

Type: Local VSAM

Run-time DDName: MODSUSR

NETINFO

Is the VSAM data set that contains various error codes (for example, 3274 error codes and SNA sense codes).

Type: Shared run-time VSAM

Run-time DDName: NETINFO

NML0G01 through NMLOG03

Are the VSAM data sets to which the LOGPROC NCL procedure ($LOPROC) in the region writes all activity log messages for subsequent online browsing from a terminal.

Type: Local VSAM

Run-time DDNames: NMLOG01 through NMLOG03

OSCNTL

Is the VSAM data set used by the region to store MDO definitions and compiled object class specifications.

Type: Shared run-time VSAM

Run-time DDName: OSCNTL

PANLDIS

Is the VSAM data set that stores full-screen panels defined by using the online editor. NCL procedures and Panel Services use these panels.

Your product provides the facility for multiple panel data sets per region. The data sets can be concatenated, and different data sets can be made available to different users.

Type: Shared run-time VSAM

Run-time DDName: PANLDIS

PANLUSR

Is a data set that has the same functions as PANLDIS and is intended for your own records. You can have separate records for test and production environments.

Type: Local VSAM

Run-time DDName: PANLUSR

PARMLIB

Is the data set (*dsnpref*.OPB9.PARMLIB) that contains the setup parameters for the product components in a region.

Type: Shared PDS

Run-time DDNames: DSIPARM and SXCTL

PSPOOL

Is the data set used to store printed output handled by the PSM facility.

Type: Local VSAM

Run-time DDName: PSPOOL

REXXAN

Is the data set used to store analysis output from the REXX Analyzer.

Type: Local PDS

REXXREP

Is the data set used to store the report generated by the REXX Analyzer.

Type: Local sequential

TESTEXEC

Is the data set (*dsnpref*.*rname*.TESTEXEC) that is concatenated as the first of the data sets forming the COMMANDS DD. The data set is used for the following procedures:

- User-written NCL procedures
- Modified versions of supplied procedures that have been copied from the distributed libraries
- Installation modified INIT and READY procedures

The setup process allocates TESTEXEC as a local data set.

Type: TESTEXEC

Run-time DDName: COMMANDS

UAMS

Is the User ID Access Maintenance Subsystem (UAMS) data set containing the security definitions for users authorized to use the region.

In a shared DASD environment with multiple regions, perhaps connected by INMC, you can define one UAMS data set that all regions can share. The regions use reserve and release logic during accesses, and ensure the integrity of the data set in a shared DASD environment. If only one data set is used, operators using ROF to connect to another region have identical authority and privileges in both regions. This situation may not be satisfactory if one region is dedicated to testing and the other to production. In this case, use two UAMS data sets, allowing a user to be profiled differently in the two regions.

If the installation uses a security exit to replace the UAMS component entirely, the UAMS data set is not required.

When logging on or changing UAMS records, a RESERVE is issued for NMUAMS. The RESERVE has the following attributes:

- Qname: NMUAMS (padded to eight characters with blanks)
- Rname: 44-character blank padded UAMS data set name
- Scope: SYSTEMS
- Level: EXCLUSIVE
- UCB: UAMS UCM address

If the sysplex is in a STAR configuration, you can convert this RESERVE to a GRS global ENQ. If the sysplex is a RING configuration, do not convert the RESERVE.

Type: Shared run-time VSAM

Run-time DDName: USERIDS

VFS

Is the data set used by the region for internal processing activities and as a general database for use by the various products. The VFS is a database used to store many record types and must not be shared across regions.

Type: Local VSAM

Run-time DDName: VFS

PDSE Services Data Sets

PDSE Services has the following data sets:

AC2DMODE

Is the SMP DLIB that contains modules used by SMP to build the program objects in the run-time PDSE.

Type: Distribution

CC2DPLD

Is a partitioned data set extended run-time library that must be APF-authorized. The data set contains program objects.

Type: Run-time PDSE

Run-time DDName: STEPLIB

Automation Services Data Sets

Automation Services has the following data sets:

ICOPANL

Is the data set that stores Automation Services icon panels.

Type: Local VSAM

Run-time DDname: ICOPANL

RAMDB

Is the distributed database that stores definitions for Automation Services.

Type: Local VSAM

Run-time DDname: RAMDB

RAMDBST

Is the data set used by Automation Services in a multisystem environment to house database updates before they are propagated to linked regions.

Type: Local VSAM

Run-time DDname: RAMDBST

RAMDBWK

Is the work data set used by Automation Services to assist the link and synchronization process.

Type: Local VSAM

Run-time DDname: RAMWORK

SOLVE Subsystem Interface Data Sets

SOLVE SSI has the following data sets:

SSIDB

Is the data set that acts as a disk-based backup to the nonvolatile part of the SOLVE SSI database. The data set contains saved application data and allows data to be preserved across restarts.

Type: Local VSAM

Run-time DDname: SSIDB

SSIPARM

Is the data set that contains the setup members for the SOLVE SSI.

Type: Run-time PDS

Run-time DDname: SSIIN

Operations Services Data Sets

Operations Services has the following data sets:

AC2HEXEC

Is the SMP DLIB that contains distributed NCL procedures as in the CC2HEXEC run-time library.

Type: Distribution

AC2HSAMP

Is the SMP DLIB that contains the same information as the CC2HSAMP library.

Type: Distribution

AC2HVSMI

Is the SMP DLIB that contains the same information as the CC2HVSMI library.

Type: Distribution

AC2HXML

Is the SMP DLIB that contains the same XML data as the CC2HXML library.

Type: Distribution

CC2HEXEC

Is the PDS that contains distributed NCL procedures and is concatenated after the TESTEXEC data set in DD COMMANDS. Collectively these data sets make up the procedure library.

Members must not be changed.

Important! If modifications are required, copy the distributed member to the TESTEXEC data set for the region for modification.

Type: Run-time PDS

Run-time DDName: COMMANDS

CC2HSAMP

Is the PDS that contains various sample exits, utilities, source code, and JCL members. The members contain documentation.

Type: Run-time PDS (external)

CC2HVSMI

Is the interim staging data set to which MODS, OSCNTL, and PANEL files are unloaded. They are later copied to the run-time MODSDIS, OSCNTL, and PANLDIS files.

Type: Staging

CC2HXML

Is the PDS that contains the XML data used by CA MSM.

Type: Run-time PDS (external)

Operations CICS Services Data Sets

Operations CICS Services has the following data sets:

ADHDEXEC

Is the SMP DLIB that contains distributed NCL procedures as in the CDHDEXEC run-time library.

Type: Distribution

ADHDMOD

Is the SMP DLIB that contains Operations CICS Services load modules.

Type: Distribution

ADHDVSMI

Is the SMP DLIB that contains the same information as the CDHDVSMI library.

Type: Distribution

ADHDXML

Is the SMP DLIB that contains the same XML data as the CDHDXML library.

Type: Distribution

CDHDCICS

Is the target load library. This load library must be APF-authorized. This means that the run-time load library, as referenced by the STEPLIB DD statement, must be defined in the operating system APF list. If no STEPLIB DD statement is used, the program load modules must reside in one of the existing authorized LNKLST libraries. Ensure that these requirements are met before attempting to start your region.

You can install your product into its own installation load library and copy the load modules across to the system load library.

Add the library to the CICS DFHRPL library concatenation.

Type: Run-time PDS

Run-time DDName: STEPLIB

CDHDEXEC

Is the PDS that contains distributed NCL procedures and is concatenated after the TESTEXEC data set in DD COMMANDS. Collectively these data sets make up the procedure library.

Members must not be changed.

Important! If modifications are required, copy the distributed member to the TESTEXEC data set for the region for modification.

Type: Run-time PDS

Run-time DDName: COMMANDS

CDHDVSMI

Is the interim staging data set to which MODS, OSCNTL, and PANEL files are unloaded. They are later copied to the run-time MODSDIS, OSCNTL, and PANLDIS files.

Type: Staging

CDHDXML

Is the PDS that contains the XML data used by CA MSM.

Type: Run-time PDS (external)

Index

$

&

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Z