

MAINVIEW[®] AutoOPERATOR[™]

Solutions Guide

Version 6.3

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 - product name
 - product version (release number)
 - license number and password (trial or permanent)
- operating system and environment information
 - machine type
 - operating system type, version, and service pack or other maintenance level such as PUT or PTF
 - system hardware configuration
 - serial numbers
 - related software (database, application, and communication) including type, version, and service pack or maintenance level
- sequence of events leading to the problem
- commands and options that you used
- messages received (and the time and date that you received them)
 - product error messages
 - messages from the operating system, such as `file system full`
 - messages from related software

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About This Book

This book documents the solutions distributed by BMC Software to run under MAINVIEW AutoOPERATOR. This edition of the guide contains MVS, CICS, DB2, SAP High Availability and many other solutions. This book is intended for installers who install MAINVIEW AutoOPERATOR solutions and by administrators who maintain MAINVIEW AutoOperator solutions as site requirements change.

How This Book Is Organized

This book is organized as follows. In addition, this book contains a glossary of terms and an index.

Chapter/Appendix	Description
Chapter 1, "Introduction to MAINVIEW AutoOPERATOR Solutions"	introductory material that applies to all solutions
Chapter 2, "JES2 Solution"	information about the JES2 monitoring solution
Chapter 3, "VTAM/NCP Solution"	information on the TCAS reply solution, which provides automatic replies to TCAS WTOR
Chapter 4, "Storage Subsystems Solution"	information about various storage subsystems solutions
Chapter 5, "Monitoring Solutions"	information about monitoring solutions
Chapter 6, "Access Methods Solution"	information about access methods solutions
Chapter 7, "Job Scheduling Solution"	information about the job scheduling solution
Chapter 8, "CONTROL M Solution"	information about the CONTROL M solution
Chapter 9, "MVS Performance Management Solutions"	Information about the MVS performance management solution
Chapter 10, "Error Recovery Solutions"	information about error recovery solutions
Chapter 11, "CICS Performance Management"	information about the CICS Performance Management solutions

Chapter/Appendix	Description
Chapter 12, "98-Initial Customization Steps"	information about customizing your system
Chapter 13, "DB2 Global Operations Solutions"	information about DB2 global operations solutions
Chapter 14, "DB2 Resource Contention Analysis Solutions"	information about DB2 Resource Contention Analysis solutions
Chapter 15, "DB2 Performance Management Solutions"	information about DB2 Performance Management solutions
Chapter 16, "E-mail Solution"	information about the e-mail solutions
Chapter 17, "SNMP Solution"	information about the SNMP solutions
Chapter 18, "Using the Paging Sample"	information about the paging sample
Chapter 19, "Using the AutoOPERATOR Web Sample"	information about how to use the AutoOPERATOR Web Sample solutions
Chapter 20, "SAP High Availability Solution"	information about a solution that improves availability for your SAP environmen
Appendixes	customer support information, examples of EXECs, and DB2 variables and parameters

Related Documentation

BMC Software products are supported by several types of documentation:

- online and printed books
- release notes and other notices

MAINVIEW AutoOPERATOR Product Library

MAINVIEW AutoOPERATOR is available with the following options:

- MAINVIEW AutoOPERATOR for OS/390
- MAINVIEW AutoOPERATOR for IMS
- MAINVIEW AutoOPERATOR for CICS
- MAINVIEW AutoOPERATOR Access NV
- MAINVIEW AutoOPERATOR TapeSHARE
- MAINVIEW AutoOPERATOR for MQSeries
- MAINVIEW AutoOPERATOR Elan Workstation
- MAINVIEW AutoOPERATOR for SAP High Availability

The base product and these options are documented in the following MAINVIEW AutoOPERATOR manuals:

- *MAINVIEW AutoOPERATOR Customization Guide*
- *MAINVIEW AutoOPERATOR Basic Automation Guide*
- *MAINVIEW AutoOPERATOR Advanced Automation Guide*
- *MAINVIEW AutoOPERATOR Options User Guide*
- *MAINVIEW AutoOPERATOR for MQSeries Installation and User Guide*
- *MAINVIEW AutoOPERATOR Reference Summary*
- *MAINVIEW AutoOPERATOR Solutions Guide*

Related Reading

To customize some products, you may need additional information not documented in this manual. Refer to the following publications:

- *MAINVIEW for DB2 User Guide*, which describes how to use the online monitor and analyzer services for use by the DB2 database administrator, system programmer, or other performance analyst.
- *MAINVIEW Common Customization Guide*
- *MAINVIEW Administration Guide*
- *Using MAINVIEW*
- *IBM Advanced Communications Function for VTAM (ACF/VTAM)*, SC38-0256, which describes VTAM parameters for subsystem communication
- *IBM System Modification Program Extended*, SC28-1107, which gives a complete explanation of IBM's System Modification Program (SMP)

Product Requirements

You must have AutoOPERATOR installed to run MAINVIEW AutoOPERATOR solutions. In addition, the following MAINVIEW components are required for RULE SETs as shown in the following table.

MAINVIEW Components Required for RULESETs

MAINVIEW Components	RULESET: TYPE	AAORUL00 MVS	AAORULM1 MVS	AAORULM1 CICS	AAORULD1-D8 DB2
MAO - MV/AO for OS/390	Yes	Yes	Yes	Yes	Yes
CAO - MV/AO for CICS			Yes	Yes	
IAO - MV/AO for IMS					Yes
RES + (Full RESOLVE product)- MV SYSPROG			Yes		
IMF - MV/IMS					Yes
CMR - MV/CICS				Yes	
DMR - MV/DB2					Yes

Naming Conventions for EXECs

The naming convention for the MAINVIEW AutoOPERATOR solutions EXECs uses the format:

gffnnnl

where:

g Is the first letter of the group (for example, M for MVS, I for IMS, C for CICS, D for DB2)

ff Is a two-character abbreviation for the functional area within the group:

Code	Functional Area
AM	access methods
ER	error recovery
IN	info sys/management
J2	JES2
J3	JES3
JS	job scheduling
MN	monitors
PE	performance
SD	shut-down
ST	storage subsystems
SU	start-up
UT	utilities
VT	vtam/ncp

nnn Is a number from 001 to 999

l Is the language of the particular EXEC (for example, X for REXX, C for CLIST)

The following two categories of EXECs do not follow this naming convention:

- Operator-initiated EXECs, which are executed as a result of an operator command.
- Text ID-driven EXECs, which are executed as a result of a Write-To-Operator (WTO) or a Write-To-Operator Reply (WTOR). The names for text-ID-driven EXECs are the text-IDs.

Online and Printed Books

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Printed release notes accompany each BMC Software product. Release notes provide current information such as

- updates to the installation instructions
- last-minute product information

In addition, BMC Software sometimes provides updated product information between releases (in the form of a flash or a technical bulletin, for example). The latest versions of the release notes and other notices are available on the Web at **<http://www.bmc.com/support.html>**.

Chapter 1 Introduction to MAINVIEW AutoOPERATOR Solutions

BMC Software provides a platform for developing automated solutions to problems within a data center. This platform consists of Rules, EXECs, timer facilities, and SYSPROG Services commands.

Using this platform, BMC Software has developed solutions to problems that are common across many data centers. These solutions assist you in accomplishing many of the initial automation tasks quickly and efficiently after you install the AutoOPERATOR product.

What's New or Changed in MAINVIEW AutoOPERATOR Solutions 6.3

This section briefly describes the changes and enhancements to this document. The changes documented in this book are the result of PTF BPO2240 and are noted by revision bars (|). PTF BPO2240 removed specific support for DB2 releases earlier than 2.3 and MAINVIEW for DB2 releases earlier than 2.1. The remaining solutions support MAINVIEW for DB2 2.1 and 3.1 and DB2 2.3 and 3.1.

New and Changed EXECs

Some EXECs have been added or modified. They are described under “EXECs” on page 7-2.

Changes to the AAORULM1 Rule Set

PM00101 has been added to AAORULM1. When this Rule Set and Rule ID are enabled at PAS initialization, the job scheduling solution is invoked. For more information, refer to Chapter 7, “Job Scheduling Solution”.

New and Changed Solutions

The MAINVIEW AutoOPERATOR for SAP High Availability solution provides continuous availability for critical SAP resources. For more information, refer to Chapter 20, “MAINVIEW AutoOPERATOR for SAP High Availability Solution”.

EXEC Distribution

All EXECs for solutions are distributed in the BBPROC data set allocated to the SYSPROC DD statement in the AutoOPERATOR subsystem.

Rules Distribution

Note: All Rules for MAINVIEW AutoOPERATOR Solutions are distributed DISABLED in the BBPARM data set.

The distribution of Rules within this data set differs depending on the environment of the solution.

Table 1-1 Rules Distribution in Different Environments

Solution Environment	Distribution of Rules
MVS and CICS	One set of Rules for all solutions in one member (AAORULM1 and AAORULC1, respectively)
DB2	One set of Rules for each solution in a separate member (AAORULD*)

For information on how to enable any of these sets of Rules, any Rules within the individual solutions, or other sets of Rules in the AutoOPERATOR product, see the Rules chapters of the *MAINVIEW AutoOPERATOR Basic Automation Guide*.

Documentation Boxes

The MAINVIEW AutoOPERATOR Solutions EXECs are distributed with a documentation box. Figure 1-1 on page 1-3 shows an example of a documentation box.

Figure 1-1 Example of a Documentation Box

```

/*****
/* DOC GROUP(MVS) FUNC(MONITORS) CODE(MN)
/* DOC DISP(YES) AUTHOR(BMC)
/* DOC DESC(RESOLVE WTO BUF SHORTAGE)
/*-----*/
/* NAME:
/* IEE249I
/*
/* DESCRIPTION:
/* RESOLVE THE WTO BUFFER SHORTAGE SITUATION
/*
/* SEE ALSO:
/* IEA404A
/* IEA405E
/*
/* INVOKED BY:
/* IEA404A
/* IEA405E
/*
/* INPUT PARAMETERS:
/* NONE
/*
/* OUTPUT:
/* NONE
/*
/* OUTBOARD CALLS:
/* NONE
/*
/* EXTERNAL ROUTINES CALLED:
/* MVS "K" OR "CONTROL" COMMANDS ARE ISSUED.
/* NOTE: FOR THE "K" COMMANDS TO BE PROPERLY AUTHORIZED, THEY
/* ---- MUST BE ISSUED FROM A NON-SUBSYSTEM CONSOLE. EDIT
/* THE MEMBER, BBISSP00, IN YOUR BBPARM DATA SET AND
/* ADD THE KEY WORD, CMDCON=1; THIS WILL DIRECT ALL COM-
/* MANDS WHICH DO NOT REQUIRE A RESPONSE TO CONSOLE
/* ID 1.
/*
/* ALERTS ISSUED:
/* NONE
/*
/* VARIABLES USED:
/* NAME: DESCRIPTION: DEFAULT VALUE:
/* MSG MESSAGE ID IEE249I
/* P1 WORD 1 CUA OF CONSOLE OR SYSLOG*
/* P2 WORD 2 CONSOLE ID
/* P3 WORD 3 COND=
/* P4 WORD 4 AUTH=
/* P5 WORD 5 NBUF=
/*
/* TEST SCRIPT INFO:
/* GENERATE A WTO FROM A TEST EXEC TO TRIGGER A CALL TO
/* EITHER OF THE DRIVER EXECs: IEA404A OR IEA405E
/*
/* RETURN CODES:
/* NONE
/* CHANGE LOG:
/* 03-05-92 BY MDR: ADDED DOCUMENTATION BOX

```

The information contained at the top of the documentation box is used by the AutoOPERATOR EXEC Management Application to display information about the EXECs in the SYSPROC libraries. GROUP, FUNC, CODE, DISP, AUTHOR, and DESC are displayed on one line by the AutoOPERATOR EXEC Management Application (refer to the *MAINVIEW AutoOPERATOR Basic Automation Guide* for a detailed explanation). The rest of the information in the documentation box is for self-documentation and easy reference.

Documentation Box Fields

Table 1-2 describes the title fields shown in Figure 1-1 on page 1-3.

Table 1-2 (Part 1 of 2)

Field	Description
GROUP	Is the group to which this EXEC belongs (for example, MVS, CICS, DB2, or IMS)
FUNC	Is the functional category within the group
CODE	Is the two-character function code
DISP	Shows whether information about this EXEC should be displayed under the AutoOPERATOR EXEC Management Application (refer to the <i>MAINVIEW AutoOPERATOR Basic Automation Guide</i>)
AUTHOR	Is the author of the EXEC
DESC	Is a 25 or fewer word description of what the EXEC does
NAME	Is the name of the EXEC
DESCRIPTION	Is a detailed description of what the EXEC does
SEE ALSO	Is a cross-reference listing
INVOKED BY	Is a list of other EXECs that call this one
INPUT PARAMETERS	Indicates the parameter name, description, and default value required for input parameters
OUTPUT	Is the information or names of variables that are returned
OUTBOARD CALLS	Indicates whether any pager calls have been placed
EXTERNAL ROUTINES CALLED	Other routines or services called, along with any special considerations for those calls
ALERTS ISSUED	Supplies brief text of long EXECs where ALERTs are issued; otherwise, a YES or NO is returned
VARIABLES USED	Indicates the variable name, description, and default value of any variables used
TEST SCRIPT INFO	Indicates the necessary environment and steps needed to test the EXEC if changes are required

Table 1-2 (Part 2 of 2)

Field	Description
RETURN CODES	Shows what return codes (if any) are returned
CHANGE LOG	Is a chronology of changes

Notes About Solutions

- Some national characters do not translate correctly when you translate from EBCDIC format to ASCII format and then back to an EBCDIC format. In particular, the national characters #, !, %, and @ translate differently depending on the country in which the translation takes place. BMC Software recommends that you avoid using national characters in your naming conventions.
- You might want to customize or modify the solutions. If you do modify a solution, BMC Software recommends that you retain the original EXEC or Rule for reference. To do so:

Step 1 Copy the solution's components into the UBBPROC data set.

Step 2 Make the modifications.

Step 3 Concatenate the UBBPROC data set to the front of the BBPROC data set in your BBI-SS JCL.

Chapter 2 JES2 Solution

The Job Entry Subsystem (JES) is critical to the processing flow of your MVS environment. There might be jobs that execute under the control of JES that are critical to your data center.

BMC Software provides the JES2 Monitoring Solution, which alerts data center personnel of any JES2-related problems.

JES2 Monitoring Solution

The Job Entry Subsystem is a critical MVS subsystem. If JES2 is not functioning correctly, the throughput on the MVS system is adversely affected. The JES2 Monitoring Solution ensures that JES2 system problems are recognized immediately.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

SYSPROG	TSO user ID of the primary system programmer who is to receive warning messages.
SYSBEEP	Information to be placed on pager.
MVSCALL	Name of support person for Elan to page. This name must be defined on the Elan Workstation.
SYSJES	Version, release, and modification level of JES in the form <i>SPn.n.n</i> .
SYSMVS	Version, release, and modification level of MVS in the form <i>SPn.n.n</i> .

See Appendix C, “MVS Solution Variables” for information about initializing variables and default settings.

Invocation

This solution is invoked by Rules for the following JES2 messages:

\$HASP050	JES2 Resource Shortage
\$HASP093	nn% Spool Utilization (JES2 V2)
\$HASP095	JES2 Catastrophic Error Or Abend
\$HASP646	nn% Spool Utilization (JES2 V3)

Processing Flow

When any of the following messages are received, an ALERT is issued with an alarm. If a value is specified for the SYSPROG variable, a message is sent to the system programmer's TSO user ID.

\$HASP050	JES2 Resource Shortage
\$HASP093	nn% Spool Utilization (with greater than 80% utilization)
\$HASP095	JES2 Catastrophic Error Or Abend
\$HASP355	Spool Volumes Are Full
\$HASP646	nn% Spool Utilization (with greater than 80% utilization)

For the \$HASP095 and \$HASP355 messages, an outboard pager call is also made if all the following conditions are met:

- The outboard component is installed.
- A value is supplied for MVSCALL, specifying the person who is paged.
- A value is supplied for SYSBEEP, specifying the information that is sent to the pager.

For \$HASP355, the command to drain the initiators is issued.

EXECs

The EXECs for the JES2 Monitoring Solutions are:

\$HASP050	Handles \$HASP050 message
\$HASP093	Handles \$HASP093 message
\$HASP095	Handles \$HASP095 message
\$HASP355	Handles \$HASP355 message
\$HASP646	Handles \$HASP646 message

Rules

The Rules for the JES2 Monitoring Solution are:

\$HASP050 Text-ID=\$HASP050

\$HASP093 Text-ID=\$HASP093

\$HASP095 Text-ID=\$HASP095

\$HASP355 Text-ID=\$HASP355

\$HASP646 Text-ID=\$HASP646

The Rules are distributed **DISABLED** in RULESET AAORULM1. You must **ENABLE** these Rules to implement this solution.

Chapter 3 VTAM/NCP Solution

Much of the work in data centers is performed interactively using online systems and terminal networks. However, the commands and replies used to communicate with the network software can be cumbersome to use.

BMC Software provides the TCAS Reply Solution, which provides automatic replies to TCAS WTORS.

TCAS Reply Solution

When TCAS ends either normally or abnormally, WTORS are issued. If these WTORS are not replied to correctly and in a timely manner, the down time for TSO can be extended unnecessarily. This solution ensures that the TCAS WTORS are replied to correctly and immediately.

Variables

This solution does not require any values to be set for variables.

Invocation

This solution is invoked by Rules for the following TCAS messages:

IKT001D	nnn Users Active Reply U, SIC or FSTOP
IKT010D	nnn Users Active Reply SIC or FSTOP
IKT012D	TCAS termination in progress - specify U or DUMP

Processing Flow

When either of the following WTORs is received, a reply of SIC is generated:

IKT001D nnn Users Active Reply U, SIC or FSTOP
(received when TCAS is started after abnormal termination)

IKT010D nnn Users Active Reply SIC or FSTOP
(received when TCAS is stopped)

When the IKT012D TCAS Termination In Progress - Specify U or DUMP WTOR is received, a reply of U is generated.

EXECs

The EXECs for the TCAS Reply Solution are:

IKT001D Handle IKT001D message

IKT010D Handle IKT010D message

IKT012D Handle IKT012D message

Rules

The Rules for the TCAS Reply Solution are:

IKT001D Text-ID=IKT001D

IKT010D Text-ID=IKT010D

IKT012D Text-ID=IKT012D

The Rules are distributed DISABLED in RULESET AAORULM1. You must ENABLE these Rules to implement this solution.

Chapter 4 Storage Subsystems Solutions

The DASD and tape subsystems can be just as important to your data center's performance as the processor. The commands and replies used to communicate with the storage subsystems are not always easy to use. Shared DASD environments present an even greater challenge.

BMC Software provides the following Storage Subsystems Solutions:

Shared DASD Control

Allows devices to be varied online/offline to all shared systems with one command

TLMS

Provides a console interface to TLMS

Storage Reply

Provides automatic reply to storage WTORs

Shared DASD Control Solution

You must issue commands on each system in the shared DASD configuration to change the status of a volume. This can also require switching consoles.

The Shared DASD Control Solution allows the status of a shared DASD volume to be changed using one command. The status change is automatically propagated to the other systems in the configuration.

Variables

For this solution to function properly in your environment, you must establish values for the following variables.

SYSN	Number of MVS systems in the shared DASD configuration
SYS1-SYSn	Names of the primary AutoOPERATOR subsystems on each MVS system in the shared DASD configuration

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

This solution is operator-invoked. Enter

%XSYSVARY P1 P2 P3

on the **COMMAND** line to change the status of a shared DASD volume, where

P1	Is the UCB address
P2	Is the desired status (for example, online or offline)
P3	Should be SHR for 3480s

Processing Flow

When the operator requests that the status of a device be changed, an EXEC is scheduled to execute on each system in the shared DASD complex.

The scheduled EXEC issues either the **VARY DEV,ONLINE** or **VARY DEV,OFFLINE** command depending on the operator specification.

EXECs

The EXECs for the Shared DASD Control Solution are:

XSYSVARY	Schedule EXECs on all systems
MST001C	Issue VARY commands

Rules

There are no Rules for the Shared DASD Control Solution.

TLMS Solution

Some data centers dedicate a console to the TLMS INQR task so the operator need not search constantly for the outstanding reply number using the `D R,L` command.

This solution lets TLMS commands be entered from the MCS console without knowing the outstanding reply number.

Variables

This solution does not require any values to be set for variables.

Invocation

This solution is operator-invoked. Enter:

```
%TLMS P1 P2
```

on the `COMMAND` line to issue a TLMS command, where:

P1 Is the TLMS command; valid values are DV, DVA, DVH, DVL, DVM, and DVR

P2 Is the volume serial number

Processing Flow

The **RESOLVE REPLIES** command is used to determine the outstanding reply number for the CAT2291D Message ID.

When the outstanding reply number is found, the TLMS command is issued using the command and volume specified by the operator.

EXECs

The EXEC for the TLMS Solution is:

TLMS Finds outstanding reply, issues command

Rules

There are no Rules for the TLMS Solution.

Storage Reply Solution

The DASD and tape storage subsystems issue WTORs that require operator intervention. If these are not replied to in a timely manner, allocation queues can back up and cause degradation of system throughput. This solution ensures that the storage WTORs are replied to correctly and immediately.

Variables

This solution does not require any values to be set for variables.

Invocation

This solution is invoked by Rules for the following messages:

IEC701D	M ddd, Volume To Be Labeled ser
IEF238D	Reply Device Name, Wait or Cancel
IEF433D	Wait Requested - Reply Hold or Nohold

Processing Flow

The following table shows the replies generated automatically for each WTOR.

Table 4-1 WTOR Generated Replies

WTOR	Description	Reply
IEC701D	M ddd, Volume To Be Labeled ser	M
IEF238D	Reply Device Name, Wait or Cancel	Wait
IEF433D	Wait Requested - Reply Hold or Nohold	Nohold

EXECs

The EXECs for the Storage Reply Solution are:

IEC701D Handles IEC701D Message

IEF238D Handles IEF238D Message

IEF433D Handles IEF433D Message

Rules

The Rules for the Storage Reply Solution are:

IEC701D Text-ID=IEC701D

IEF238D Text-ID=IEF238D

IEF433D Text-ID=IEF433D

The Rules are distributed **DISABLED** in RULESET AAORULM1. You must **ENABLE** these Rules to implement this solution.

Chapter 5 Monitoring Solutions

The following Monitoring Solutions, provided by BMC Software, are designed to assist data center personnel in monitoring events occurring in the system:

Dump Data Sets Manages dump data sets to keep a minimum number available

WTO Buffers Resolves WTO buffer shortages

SMF Data Sets Manages dumping and switching of SMF data sets

LOGREC Manages clearing of SYS1.LOGREC

RMF Monitor Monitors status of RMF

Dump Data Sets Monitoring Solution

This solution lets the system automatically manage its system dump data sets. It attempts to keep a minimum number of dump data sets free at all times.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

DUMPCLER Name of task to clear dump data sets

DUMPMF Number of dump data sets to keep clear

DUMPNDS Total number of dump data sets

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

This solution is invoked by Rules for the following messages:

- IEA911E** Complete/Partial Dump on SYS1.DUMPnn
- IEA994A** All Dump Data Sets Are Full And No SVC Dumps Can Be Taken
- IEA994E** All Allocated SYS1.DUMP Data Sets Are Full

This solution can also be operator-invoked. Type:

```
%@DUMPCLRO
```

to clear the oldest dump data set.

Processing Flow

The following processing checks for a value specification for the variable **DUMPCLER**. If a value was not specified, processing ends.

When the **IEA911E Complete/Partial Dump on SYS1.DUMPnn** message is received, the current number of free dump data sets is compared to the minimum number that should be kept free. If the number of free data sets is less than the minimum, a task to clear the oldest dump data set is started.

When either of the following messages is received, a task to clear the oldest dump data set is started:

- IEA994A** All Dump Data Sets Are Full And No SVC Dumps Can Be Taken
- IEA994E** All Allocated SYS1.DUMP Data Sets Are Full

EXECs

The EXECs for the Dump Data Sets Monitoring Solution are:

@DMPCLRO	Starts task to clear oldest dump data set
IEA911E	Compares minimum free with current free data sets
IEA994A	Invokes @DMPCLRO
IEA994E	Invokes @DMPCLRO

Rules

The Rules for the Dump Data Sets Monitoring Solution are:

IEA911E	Text-ID=IEA911E
IEA994A	Text-ID=IEA994A
IEA994E	Text-ID=IEA994E

The Rules are distributed DISABLED in RULESET AAORULM1. You must ENABLE these Rules to implement this solution.

WTO Buffers Monitoring Solution

This solution lets the system automatically resolve WTO buffer shortages.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

SYSPROG	TSO userid of primary system programmer to receive warning messages
SYSMVS	Version, release, and modification level of the MVS system in use

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

In addition to setting variables, the parameter CMDCON must be specified in member BBISSP00 of the BBPARM data set. This is required because the K Q command used to clear buffers cannot be issued from a subsystem console. Specifying CMDCON causes all commands issued without response to be issued with the CMDCON console ID.

Invocation

This solution is invoked by Rules for the following messages:

IEA404A Severe WTO Buffer Shortage - 100% Full

IEA405E Severe WTO Buffer Shortage - 80% Full

Processing Flow

When either the IEA404A or IEA405E buffer shortage message is received, an ALERT is generated. If a value was specified for SYSPROG, a warning message is sent to the primary system programmer.

The D C command is issued to determine the number of buffers in use by each console. The buffers are deleted using one of the following commands:

K Q,L=console id (clearing console buffers)

WRITELOG (clearing syslog buffers)

After the shortage is relieved, the ALERT is deleted. If a value was specified for SYSPROG, a message is sent to notify the primary system programmer that the shortage has been relieved.

EXECs

The EXECs for the WTO Buffers Monitoring Solution are:

IEA404A Generate ALERTs, invoke IEE249I/IEE889I

IEA405E Generate ALERTs, invoke IEE249I/IEE889I

IEE249I Clear buffers (pre-MVS SP4)

IEE889I Clear buffers (SP4 and later)

Rules

The Rules for the WTO Buffers Monitoring Solution are:

IEA404A Text-ID=IEA404A

IEA405E Text-ID=IEA405E

The Rules are distributed **DISABLED** in RULESET AAORULM1. You must **ENABLE** these Rules to implement this solution.

SMF Data Set Monitoring Solution

This solution manages dumping and switching a system to automatically determine which other system in the shared DASD configuration is preventing access to a shared device.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

SMFALT Suffix of alternate SMF parameters

SMFCLEAR Task name to dump SMF data sets

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

This solution is invoked by Rules for the following SMF messages:

IEE361I	SMF Data Lost - No Data Sets Available
IEE362A	SMF Enter Dump For SYS1.MANx On ser
IEE364I	SMF (Logical/Physical) Error On SYS1.MANx
IEE366I	No SMF Data Sets Available - Data Being Buffered
IEE391I	SMF Enter Dump for Data Set on VOLSER ser, DSN=dsname
IEE392I	SMF Enter Dump for Data Set on VOLSER ser, DSN=dsname
IEE393I	SMF(LOGICAL PHYSICAL) I/O Error on dsname

Processing Flow

The processing flow for the SMF Data Set Monitoring Solution is described as follows:

When the IEE362A, IEE391A or IEE392I SMF Enter Dump For SYS1.MANx ON SER message is received, the task to dump the data set (SMFCLEAR) is started. If a value was not specified for the SMFCLEAR variable, no processing occurs.

When the IEE949I or IEE974I message (output from D SMF command) is received, the task to dump the data set (SMFCLEAR) is started if it is not already active. If a value was not specified for the SMFCLEAR variable, no processing occurs.

When the IEE361I, IEE364I, IEE393I or IEE366I messages are received, the primary system programmer is notified if a value was specified for the SYSPROG variable.

If a value was specified for variable SMFALT, the operator receives an ALERT requesting that the alternate SMF parameters be switched. If the operator confirms the switch, the T SMF command is issued. The primary system programmer is notified of the switch if a value was specified for the SYSPROG variable.

EXECs

The EXECs for the SMF Data Set Monitoring Solution are:

IEE361I	Handles IEE361I message
IEE362A	Handles IEE362A message
IEE364I	Handles IEE364I message
IEE366I	Handles IEE366I message
IEE391I	Handles IEE391I message
IEE392I	Handles IEE392I message
IEE393I	Handles IEE393I message
IEE949I	Handles IEE949I message
IEE974I	Handles IEE974I message
MMN001C	Switches to alternate SMF parameters
MMN004C	Switches to alternate SMF parameters

Rules

The Rules for the SMF Data Set Monitoring Solution are:

IEE361I	Text-ID=IEE361I
IEE362A	Text-ID=IEE362A
IEE364I	Text-ID=IEE364I
IEE366I	Text-ID=IEE365I
IEE391I	Text-ID=IEE391I
IEE392I	Text-ID=IEE392I
IEE393I	Text-ID=EE393I
IEE949I	Text-ID=IEE949I
IEE974I	Text-ID=IEE974I

The Rules are distributed DISABLED in RULESET AAORULM1. You must ENABLE these Rules to implement this solution.

LOGREC Data Set Monitoring Solution

This solution lets the system automatically manage the SYS1.LOGREC data set.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

LOGREC	Task name to clear SYS1.LOGREC data set
SYSPROG	TSO user ID of primary system programmer to receive warning messages
SYSBEEP	Information to be placed on pager
MVSCALL	Name of the support person for Elan to page; this name must be defined on the Elan Workstation

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

This solution is invoked by a Rule for the following messages:

IFB040I	SYS1.LOGREC Area Is Full
IFB060E	SYS1.LOGREC Near Full
IFB070I	Logrec Cannot Be Accessed. Record Is Lost

Processing Flow

When either the IFB040I or IFB060E LOGREC FULL message is received and a value was specified for variable LOGREC, the following actions are taken:

- The task to clear SYS1.LOGREC is started.
- An ALERT is issued.
- If a value was specified for variable SYSPROG, a message is sent to the system programmer.

When the IFB070I Logrec Cannot Be Accessed message is received, the following actions are taken:

- An ALERT is issued.
- If a value was specified for variable SYSPROG, a notification is sent to the system programmer.
- If a value was specified for variable MVSCALL and SYSBEEP, an outboard pager call is made.

EXECs

The EXECs for the LOGREC Data Set Monitoring Solution are:

IFB040I	Handles IFB040I message
IFB060E	Handles IFB060E message
IFB070I	Handles IFB070I message

Rules

The Rules for the LOGREC Data Set Monitoring Solution are:

IFB040I	Text-ID=IFB040I
IFB060E	Text-ID=IFB060E
IFB070I	Text-ID=IFB070I

The Rules are distributed DISABLED in RULESET AAORULM1. You must ENABLE these Rules to implement this solution.

RMF Monitoring Solution

This solution issues an ALERT if RMF ends.

Variables

This solution does not require any values to be set for variables.

Invocation

This solution is invoked by a Rule for the following message:

ERB102I sid: Terminated

Processing Flow

When the ERB102I message is received, an ALERT is issued.

EXECs

The EXEC for the RMF Monitoring Solution is:

ERB102I Handles ERB102I message

Rules

The Rule for the RMF Monitoring Solution is:

ERB102I Text-ID=ERB102I

The Rule is distributed DISABLED in RULESET AAORULM1. You must ENABLE this Rule to implement this solution.

Chapter 6 Access Methods Solution

The Access Methods Solution is designed to alert the data center personnel when failures occur during I/O processing.

BMC Software provides the VSAM Failures Solution to alert the operator when a failure occurs in specified address spaces.

VSAM Failures Solution

This solution alerts the operator when VSAM I/O fails in a critical address space or job stream.

Variables

For this solution to function properly in your environment, edit the IDC3009I and IDC3351I EXECs to set values for the jobs where VSAM failures are critical.

SYSPROG	TSO user ID of primary system programmer to receive warning messages
SYSBEEP	Information to be placed on pager
MVSCALL	Name of the support person for Elan to page; this name must be defined on the Elan Workstation

See Appendix C, “MVS Solution Variables” for information on these variables.

Invocation

This solution is invoked by Rules for the following text-IDs:

IDC3009I	VSAM CATALOG RETURN CODE IS rc
IDC3351I	VSAM OPEN CLOSE I/O RETURN CODE IS rc

Processing Flow

When the message for either IDC3009I or IDC3351I is received, a comparison is made against the originating job name and the user-specified job names; if a match is found, an ALERT is issued to inform the operator of the failure.

If values for the SYSPROG, SYSBEEP, and MVSCALL variables were established during AutoOPERATOR initialization, the processing continues by sending a TSO message to SYSPROG and by paging the SYSBEEP number through the outboard processor.

EXECs

The EXECs for the VSAM Failures Solution are:

IDC3009I	Issues an ALERT
IDC3351I	Issues an ALERT

Rules

The Rules for the VSAM Failures Solution are:

IDC3009I	Text-ID=IDC3009I
IDC3351I	Text-ID=IDC3351I

The Rules are distributed DISABLED in RULESET AAORULM1. You must ENABLE these Rules to implement this solution.

Chapter 7 Job Scheduling Solution

The Job Scheduling Solution is can be used to assist data center personnel in scheduling and managing time-dependent tasks. An alternate solution would be to use Continuous State Manager (CSM). For morer information on CSM, refer to the *MAINVIEW AutoOPERATOR Basic Automation Guide*.

Introduction

This solution consists of time-initiated EXECs that are scheduled at PAS startup time. These EXECs must be modified to contain the commands to start the time dependant task.

Variables

None.

Invocation

AAORULM1 contains disabled Rule PM00101. When this Rule Set and Rule ID are enabled at PAS initialization, this solution is invoked.

The appropriate EXECs must be modified with the necessary commands to start the various tasks.

Processing Flow

AAOPRMxx is updated to enable Rule Set AAORULM1 and PM00101 is enabled at a cold start. The PAS is restarted with either the Rule Set and Rule already enabled from a previous invocation, or a cold start is done with AAORULM1 listed in AAOPRMxx.

EXECs

The following EXECs can be used for the Job Scheduling Solution:

EXECs	Origin/Function
PM00101	Scheduled from the PM00101 Rule in Rule Set AAORULM1
MSU002C	Scheduled from within PM00101 at PAS initialization
MSU005C	Scheduled from within MSU002C and schedules the various EXECs that set timer EXECs.
MJSU001C	Starts daily events.
MJSU002C	Starts Sunday events.
MJSU003C	Starts Monday events.
MJSU004C	Starts Tuesday events.
MJSU005C	Starts Wednesday events.
MJSU006C	Starts Thursday events.
MJSU007C	Starts Friday events.
MJSU008C	Starts Saturday events.

Rules

The Rule for the Job Scheduling Solution is

PM00101 This Rule is distributed disabled in Rule Set AAORULM1. You need to enable this Rule to implement this solution.

Chapter 8 CONTROLM Solution

Introduction

Provides a command interface to CONTROLM.

The operator uses an MVS `MODIFY` command to communicate with the CONTROLM job scheduling software. This solution provides a command interface to CONTROLM that alleviates the need for the `MODIFY` command.

Variables

This solution does not require you to set values for any variables.

Invocation

This solution is operator-invoked. Enter:

```
%SCHEDCOM P1
```

on the `COMMAND` line to issue a `CONTROLM` command, where:

P1 CONTROLM command; valid values are `CTMX004` and `NEWDEST`

Processing Flow

The following command is issued using the input parameter as the CONTROLM command:

```
F CONTROLM,cmd
```

EXECs

The EXEC for the CONTROLM Solution is:

SCHEDCOM Issues MODIFY command

Rules

| There are no Rules for the CONTROLM Solution.

Chapter 9 MVS Performance Management Solutions

The Performance Management Solutions are designed to assist data center personnel monitor and adjust system parameters affecting system performance.

BMC Software provides the following three solutions:

Load Balancing

Lets the system dynamically adjust job initiator structure based on performance considerations

DASD Reserve Analysis

Provides immediate insight into contention problems in a shared DASD environment

Exception Monitoring

Extends the capabilities of the RESOLVE Advanced Early Warning (AEW) system

Load Balancing Solution

As workload type and activity on your system changes, you might want to adjust your job initiator configuration. For example, you might want to take advantage of times when the system resources support additional initiators without adversely affecting system performance. Or you might want to limit access to the system at times when resources are constrained.

This solution lets the system automatically increase or decrease its workload (initiators) based on current system performance and job demand.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

LBGPAGE	Paging rate at which an attempt is made to decrease workload
LBGCPUH	CPU utilization percentage at which an attempt is made to decrease workload
LBGCPUL	CPU utilization percentage at which an attempt is made to increase workload
LBGIBEG	Beginning initiator number to manage
LBGIEND	Ending initiator number to manage
LBGIINC	Number of initiators to start in an increase situation
LBGIDEC	Number of initiators to stop in an decrease situation
LBGCLAS	Class priority list from high to low

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

This solution is operator-invoked. Type:

```
%LBSTART
```

on the COMMAND line to begin load balancing on your system.

Processing Flow

Every five minutes, this solution compares the current CPU utilization and paging rate to the threshold variables. If any threshold is crossed 3 times within 15 minutes, an action is taken.

If CPU utilization is below the low CPU threshold, an attempt is made to increase the workload by starting additional initiators.

Initiators (up to the maximum specified by variable LBGIIINC) that have a status of either DRAINED or HALTED are started. Classes are assigned to the initiators based on the class priority list (variable LBGCLAS) and work waiting to execute.

If the CPU utilization is above the high CPU threshold or the page rate is above the page rate threshold, an attempt is made to decrease the workload by stopping initiators. Initiators (up to the maximum specified by variable LBGIDEC) that have a status of either active or INACTIVE are purged or drained.

EXECs

Following are the EXECs for the Load Balancing Solution:

LBSTART	Initializes CPU and page threshold counters, calls MPE003C to build initiator table, schedules MPE004C to execute in five minutes
MPE003C	Retrieves initiator information from JES
MPE004C	Manages CPU and page threshold counters, schedules MPE005C to execute
MPE005C	Compares current CPU and page values against thresholds (if adjustment is necessary), and schedules MPE006C to execute or schedules MPE004C to execute in five minutes
MPE006C	Starts/stops initiators and schedules MPE004C to execute again in five minutes

Rules

There are no Rules for the Load Balancing Solution.

DASD Reserve Analysis Solution

In shared DASD environments, one or more systems can be prevented from accessing an entire DASD volume due to hardware reserves by another system. If a reserve remains in effect for an extended period of time, end-user response time can be severely affected.

This solution lets the system automatically determine which other system in the shared DASD configuration is preventing access to a shared device.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

SYSN	Number of MVS systems in the shared DASD configuration
SYS1-SYSn	Names of the primary AutoOPERATOR subsystem on each MVS system in the shared DASD configuration

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

This solution is invoked by a Rule for the following IOS message:

```
IOS071I UCB,CHPID,JOBNAME,START PENDING
```

Processing Flow

When the IOS071I message is received, a remote EXEC is scheduled on every other system in the shared DASD complex.

Each of the other systems use the RESOLVE RESERVE command to examine the DASD reserves it is currently holding. Any system that has a device reserved issues an operator ALERT back to the system that is being prevented access to the device.

EXECs

The EXECs for the DASD Reserve Analysis Solution are:

IOS071I	Schedules remote EXECs
MPE001C	Examines currently held reserves
MPE002C	Issues ALERT

Rules

The Rule for the DASD Reserve Analysis Solution is:

IOS071I Text-ID=IOS071I

The Rule is distributed **DISABLED** in RULESET AAORULM1. You must **ENABLE** this Rule to implement this solution.

Exception Monitoring Solution

If you use BMC Software's SYSPROG Services product, you might want to extend its Advanced Early Warning (AEW) capabilities.

This solution lets RESOLVE AEW messages be posted to the AutoOPERATOR ALERT application and, in some instances, provides information about the causes of an exception condition.

Variables

For this solution to function properly in your environment, you must establish values for the following variables:

MAXCCPU	Maximum complex CPU utilization percentage
MAXTCPU	Maximum CPU utilization by TSO address spaces
MAXBCSA	Maximum CSA utilization percentage below the 16M line
MAXACSA	Maximum extended CSA utilization percentage
MAXDEVU	Maximum device utilization percentage

See Appendix C, “MVS Solution Variables” for information about initializing the variables and default settings.

Invocation

To invoke the Exception Monitoring Solution:

- Step 1** The entire RESOLVE PLUS software is required to use the MVS Performance Monitoring Solution.

ENABLE the following Rules in the AAORULM1 RULESET:

```
PWSCPU00 *WARNING* CPU 1 USAGE IS (x)%  
OR  
PWSCPU01 *WARNING* CPU COMPLEX USAGE IS (x)%  
  
PWSCPU02 *WARNING* CPU USAGE IS (x)% FOR TSO  
  
PWSCSA01 *WARNING* CSA/ECSA USAGE IS (x)%; (x)K ARE  
FREE  
  
PWSDEV01 *WARNING* DVN VOLUME USAGE IS (x)%
```

- Step 2** To install these solutions:

- 2.A** Activate the AEW sampler.

```
COPY <PREFIX>.BBPARAM(PWSCPMZZ) TO  
<PREFIX>.UBBPARM,DISP=SHR
```

- 2.B** Add the following statement to your BBI-SS JCL to activate the PWSCPM00 Rule.

```
//LIB DD DSN=<OREFIX>.UBBPARM,DISP=SHR
```

Restart your BBI subsystem after making those changes.

- Step 3** Set the variables for these solutions in <PREFIX>.UBBPROC member MSU002C.

Additional information is provided in MSU002C and PWSCPM00.

- Step 4** ENABLE the Rules in RULESET AAORULM1.

If you have only one CPU in the system in which you are running this BBI subsystem, ENABLE Rule PWSCPU00.

If there are multiple CPUs running, ENABLE Rule PWSCPU01.

Issue a RESOLVE CPU command to check the number of CPUs running in your system.

Processing Flow

Caution
Do not ENABLE both PWSCPU00 and PWSCPU01. These two Rules schedule EXECs that use the same variables in EXEC MSU002C and are mutually exclusive.

If either of the PWSCPU messages is received 3 or more times within 10 minutes, the CPU value in the message is compared against the appropriate CPU threshold variable. If the threshold is exceeded, an ALERT is issued and an additional monitor (\$TOTCPU or \$TSOCPU, depending on which threshold is exceeded) is invoked.

The \$TOTCPU and \$TSOCPU EXECs issue the RESOLVE CPU command to determine who is the current major user of the CPU (\$TSOCPU limits the search to TSO users only). The EXECs then issue ALERTs to give the operator insight into which users are responsible for the exception condition.

When either the PWSCSA01 or PWSDEV01 message is received, the value in the message is compared against the appropriate threshold variable. If the threshold is exceeded, an ALERT is issued.

EXECs

The EXECs for the Exception Monitoring Solution are:

PWSCPU00	Monitors MAXCCPU threshold
PWSCPU01	Monitors MAXCCPU threshold
PWSCPU02	Monitors MAXTCPU threshold
PWSCSA01	Monitors MAXBCSA and MAXACSA thresholds
PWSDEV01	Monitors MAXDEVU threshold

Rules

The Rules for the Exception Monitoring Solution are:

PWSCPU00 Text-ID=PWSCPU00

PWSCPU01 Text-ID=PWSCPU01

PWSCPU02 Text-ID=PWSCPU02

PWSCSA01 Text-ID=PWSCSA01

PWSDEV01 Text-ID=PWSDEV01

The Rules are distributed **DISABLED** in RULESET AAORULM1. You must **ENABLE** these Rules to implement this solution.

Chapter 10 Error Recovery Solutions

Critical messages from CICS can be lost among the message traffic at the operator console. Also, replies to those messages and the follow-up actions taken might not be consistent.

The Error Recovery Solutions assist data center personnel when critical errors occur in the CICS environment.

BMC Software provides the following Error Recovery Solutions:

Storage Violation

Notifies a central operator of storage violations

CICS Abnormal Termination

Notifies a central operator of any CICS region abend

VSAM Subtask Abnormal Termination

Notifies a central operator of a VSAM subtask abend and automatically replies to the abnormal WTOR

Temporary Storage Data Set Extension Failure

Notifies a central operator and provides a follow-up display for investigating the problem

Terminal Errors

Resets terminal status after a terminal error occurs

Storage Violation Solution

The Storage Violation Solution notifies an operator when a storage violation has occurred.

Variables

For the Storage Violation Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLYTPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by the Rule for the following text-ID:

DFH0508 A STORAGE VIOLATION HAS OCCURRED

Processing Flow

When the DFH0508 message is received, the ALERT:

```
*STORAGE VIOLATION IN CICS cicsid, REPLY YES TO CANCEL
```

is sent to ask the operator to confirm cancellation of the CICS region that suffered the storage violation. If the operator replies yes, the region is cancelled and the message:

```
*STORAGE VIOLATION IN CICS cicsid, BEING CANCELED NOW
```

is sent.

To modify the solution to automatically cancel the region without asking for operator confirmation, edit BBPROC member DFH0508. When automatic cancel is in effect, the ALERT BEING CANCELED NOW is sent.

EXECs

The EXECs for the Storage Violation Solution are:

DFH0508	Handles DFH0508 message
CER001C	Cancels the CICS system after a storage violation

Rules

The Rules for the Storage Violation Solution are:

DFH0508	Text-ID=DFH0508
DFHSM010	Test-ID=DFHSM010

The Rules are distributed DISABLED in RULESET AAORULC1. You must ENABLE these Rules to implement this solution. You must ENABLE DFHSM010 for CICS/ESA.

CICS Abnormal Termination Solution

The CICS Abnormal Termination Solution notifies an operator when an abend in a CICS region has been detected.

Variables

For the CICS Abnormal Termination Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLYTPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by the Rule for the following text-ID:

DFH0606 ABEND xxxx - xxxx HAS BEEN DETECTED

Processing Flow

In response to the DFH0606 message, an ALERT is sent to the FOCAL POINT target to indicate a catastrophic abend ended a CICS system.

EXECs

The EXEC for the CICS Abnormal Termination Solution is:

DFH0606 Handles DFH0606 message

Rules

The Rule for the CICS Abnormal Termination is:

DFH0606 Text-ID=DFH0606

The Rule is distributed DISABLED in RULESET AAORULC1. You must ENABLE this Rule to implement this solution.

VSAM Subtask Abnormal Termination Solution

The VSAM Subtask Abnormal Termination Solution automatically notifies an operator when a VSAM subtask abends.

Variables

For the VSAM Subtask Abnormal Termination Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLYTPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by the Rule for the following text-ID:

DFH0901 VSAM SUBTASK ABEND - DO YOU WANT TO CONTINUE IN A DEGRADED MODE OR ABEND? REPLY GO OR CANCEL.

Note: This solution cannot be used for CICS/ESA.

Processing Flow

When the DFH0901 WTOR is received, this solution replies GO to let CICS continue initialization and the following ALERT message is sent:

*VSAM SUBTASK ABEND, CICS CONTINUING IN DEGRADED MODE

To modify the solution to reply CANCEL instead of GO, edit BBPROC member DFH0901. When automatic cancel is in effect, the solution replies CANCEL to the DFH0901 WTOR and issues the ALERT:

*VSAM SUBTASK ABEND, CICS BEING CANCELLED AUTOMATICALLY

EXECs

The EXEC for the VSAM Subtask Abnormal Termination Solution is:

DFH0901 Handles DFH0901 message

Rules

The Rule for the VSAM Subtask Abnormal Termination Solution is:

DFH0901 Text-ID=DFH0901

The Rule is distributed **DISABLED** in RULESET AAORULC1. You must **ENABLE** this Rule to implement this solution.

CICS Temporary Storage Suspensions Solution (CICSTSS)

This solution detects and automatically corrects suspensions of CICS Temporary Storage processing caused when Auxiliary Temporary Storage data set is full.

When that is the case, CICS suspends processing for many transactions—not only transactions that are writing to temporary storage directly but many transactions (including system functions) that use temporary storage indirectly are also affected. For example, the EXEC CICS START command with the DATA parameter causes CICS to use temporary storage to hold the data being passed to the started task.

Variables

This solution does not use any specific variable requiring special initialization. However, variables describing the CICS systems, as explained in Appendix D, “CICS Solution Variables”, should be set.

Invocation

The EXECs in this solution are scheduled when the following message is received:

```
FT068*          NNNNNN TEMPORARY STORAGE SUSPENSIONS HAVE  
                OCCURRED
```

Processing Flow

All EXECs in this solution are message-driven. The EXECs create ALERT messages that may require an operator reply to initiate a follow-up EXEC, or may include extended help or follow-up commands. The IND column of the Alert Detail Display shows which options are available for each ALERT.

If an ALERT message has an E in the IND column, a follow-up EXEC is assigned. The message text (or extended help panel) explains what reply is requested. You should enter the message text in the LC column of the ALERT display to invoke the follow-on EXEC.

If an ALERT message has a H in the IND column, an Extended Help Panel is assigned. You should type the EXPAND command and press **Enter** (or use the EXPAND PFK, if assigned) after placing the cursor anywhere in the ALERT message text to display the help panel.

If an ALERT message has a C in the IND column, a follow-up Primary Command is assigned. You should type the TRANSFER command and press **Enter** (or use the TRANSFER PFK, if assigned) after placing the cursor anywhere in the ALERT message text to invoke the command. The follow-up command transfers you to a display with more information to help solve the problem.

EXECs

The EXECs for the CICSTSS Solution are:

- | | |
|----------------|--|
| FT068 | Starts follow-up of temporary storage suspensions by scheduling CER004C and setting a timer for CER003C. |
| CER003C | Executes the CICS MANAGER Problem Display and looks for the FT068 message. If found, it compares the count in the message to the count saved in a variable. If the count has increased, the investigation EXECs are kicked off. |
| CER004C | Executes the CICS MANAGER Task Display and purges any tasks waiting on temporary storage processing (ATSP). |
| CER005C | Executes the CICS MANAGER Temporary Storage Unit Table (TSUT) display and purges some Auxiliary TSUT entries. It first purges any entries that start with CEBR, which typically contain transaction dump output. If the TSP suspension persists, on the next iteration, CER005C purges the largest TSUT entry. The largest entry is determined by examining the Data Length and PUTQ count fields. |
| CER006C | Handles the reply from the ALERT created by CER004C. |

Rules

There is one Rule for each of the messages listed in “Invocation” on page 10-7. The Rule-IDs equal the message-IDs.

The Rules are distributed DISABLED in RULESET AAORULC1. You must ENABLE the following Rules to implement this solution: CICSTART, CICSTERM, FT426W, FT425W, and FT435I.

Temporary Storage (TS) Data Set Extension Failure Solution

The Temporary Storage (TS) Data Set Extension Failure Solution notifies a central operator and provides a follow-up display for investigating the problem.

Variables

For the Temporary Storage Data Set Extension Failure Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLYTPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by the Rule for the following text-ID:

DFH1311	TEMPORARY STORAGE DATA SET IS FULL AND CANNOT BE EXTENDED
----------------	---

Processing Flow

In response to DFH1311, an ALERT is issued. In addition, the CICS MANAGER TEMPSTOR command is associated with the ALERT. The operator can use the command to map the temporary storage usage.

EXECs

The EXEC for the Temporary Storage Data Set Extension Failure Solution is:

DFH1311	Handles DFH1311 message
----------------	-------------------------

Processing Flow

In response to DFH3437I, the terminal status is reset using CEMT: NOCREATE is set to CREATE and OUTSERV is set to INSERV.

After 10 retries, VTAM commands are entered to reset the node prior to attempting CEMT. After 15 retries, recovery is stopped and this ALERT is sent:

```
*TERM term NODE node STATUS status AFTER 15 RETRIES
```

EXECs

The EXECs for the Terminal Errors Solution are:

DFH3437I Handles DFH3437I message

CER002C Resets the terminal retry counter

Rules

The Rules for the Terminal Errors Solution are:

DFH3437I Text-ID=DFH3437I

DFH3437I Text-ID=DFH3437I

The Rules are distributed DISABLED in RULESET AAORULC1. You must ENABLE DFH3437I to implement this solution. ENABLE DFH3437I for CICS/ESA.

Chapter 11 CICS Performance Management Solutions

The CICS Performance Management Solutions help data center personnel achieve maximum availability and increased response time.

BMC Software provides the following Performance Management Solutions:

File Degradation Analysis

Automatically analyzes factors causing poor response time for a CICS file

File Allocation - Deallocation

Lets you allocate, enable, and open, or lets you close, disable, and deallocate files from a target CICS system

VSAM Control Area Split Monitor

Notifies the operator of VSAM Control Area split problems

Transaction Response Time Monitor

Notifies the operator when transactions are exceeding response time objectives

File Degradation Analysis Solution

Most CICS response time problems are caused by I/O performance problems. High I/O service times, as reported by the CICS MANAGER Background Problem Service, are presented on various displays and logged to the BBI-SS Journal. Constant investigation of I/O problems can be very time consuming. Further, because most I/O contention problems are transient, factors causing a problem seem to disappear before an investigation is started.

This solution automatically analyzes the factors causing disk I/O performance problems that affect CICS response time.

Note: This solution requires RESOLVE services.

Variables

For the File Degradation Analysis Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of MAINVIEW AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLYTPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by a Rule for the following text-ID:

FT095W FILE filename EXCEEDED SERVICE TIME, n.nnn IS AVERAGE SERVICE TIME

Processing Flow

When the FT095W message is received, contention for logical and physical resources in the system where the target CICS is executing is analyzed using CICS MANAGER and RESOLVE services. EXECs also are scheduled to look for any contention from other systems in the shared DASD environments. Results of the analysis are written in the MAINVIEW AutoOPERATOR Subsystem Log.

All results messages written to the MAINVIEW AutoOPERATOR Subsystem log are prefixed with a message-ID. The message-ID consists of a fixed literal (CAF#), followed by the EXEC sequence number (IMFEID); for example, CAF#1234. Use the message-ID to search for all messages from a given file analysis in the log, even when they arrive from different systems at different times and are intermixed with other messages in the SS Log.

The following messages are written to the MAINVIEW AutoOPERATOR Subsystem Log:

```
STARTING FILE DEGRADATION ANALYSIS FOLLOWING FT095W
FOR FILE filename IN CICS SYSTEM cicsid (smfid)
ON VOLUME volser ON UNIT ucb WITH nnnnn EXCPS.
```

```
DATASET dsname IS ALSO ALLOCATED TO JOB(S):
jobname1, jobname2, .... ON SYSTEM smfid.
```

```
NO OTHER JOBS ON SYSTEM smfid ARE USING DATASET dsname
IN CICS SYSTEM cicsid.
```

```
DEVICE ucb IS LESS THAN n% BUSY ON SYSTEM smfid.
```

```
DEVICE ucb WAS OBSERVED nnn% BUSY ON SYSTEM smfid
WITH AN I/O RATE OF nnn PER SECOND
AND AN AVERAGE WAIT TIME OF n.nnn MS.
```

```
nnn% OF THE ACTIVITY ON ucb IS FROM JOB jobname.
```

```
DEGRADATION ANALYSIS COMPLETE FOR FILE filename
ON SYSTEM smfid, RESULTS FROM OTHER SYSTEM(S)
WILL FOLLOW IN THE LOG WITH THE SAME MESSAGE ID.
```

EXECs

The EXECs for the File Degradation Analysis Solution are:

FT095W	As primary EXEC, schedules all secondary CPEnnn EXECs that follow
CPE001C	Searches for the DD name corresponding to the filename when the file is an IMS database
CPE002C	Reports on other jobs allocated to the CICS file data set name
CPE003C	Reports on other jobs using the device where the CICS file is located
CPE004C	Gets the data set name, volser number, and UCB for the CICS filename using the RESOLVE TIOT command

Rules

The Rule for the File Degradation Analysis Solution is:

FT095W Text-ID=FT095W

The Rule is distributed DISABLED in RULESET AAORULC1. In addition to this Rule, the following Rules must be ENABLED to implement this solution: CICSTART, CICSTERM, FT426W, FT425W, and FT435I.

File Allocation - Deallocation Solution

The batch window (the interval between the time CICS is stopped and started again) might be too short to accommodate the necessary batch jobs to extract, update, and back up files used by CICS. If the window is too small, the operator must enter commands to close, disable, and free, and then later allocate, enable, and open files. This takes time, is tedious, and is prone to error. Syntax errors or a missed step in a complicated procedure can cause resources to be unavailable for use by CICS transactions.

This solution lets batch jobs allocate and deallocate files from a running CICS system. This lets files be freed from CICS, processed by other jobs, and returned to CICS, while CICS remains available for other users.

Variables and JCL

For the File Allocation - Deallocation Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of MAINVIEW AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLTYPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

Most aspects of this solution are invoked from batch JCL. Edit two sample JCL members distributed in the BBUSER data set to specify file names and CICS region names.

CAOALLOC Allocate, enable, and open a file in a CICS system from a batch job

CAODEALO Close, disable, and free a file in a CICS system from a batch job

The remaining aspects of this solution are invoked by Rules for the following text-IDs:

FT401E ALLOC FAILED RC=XX EC=XX FILE filename DSN dsname

FT402I ALLOC COMPLETE FOR FILE filename DSN dsname

FT403E DEALLOC FAILED NOT ALLOCATED FILE filename

FT404I DEALLOC COMPLETE FOR FILE filename

Processing Flow

When the batch job CAOALLOC is run, the file you specified is allocated, enabled, and opened on the CICS system you specified.

When the batch job CAODEALO is run, the file you specified is closed, disabled, and freed on the CICS system you specified.

EXECs

The EXECs for the File Allocation-Deallocation Solution are:

CPEALLOC	Allocates, enables, and opens a file in a CICS system
CPEDEALO	Closes, disables, and deallocates a file in a CICS system
FT401E	Stores the result from IMFEXEC ALLOC in a shared variable
FT402I	Stores the result from IMFEXEC ALLOC in a shared variable
FT403E	Stores the result from IMFEXEC FREE in a shared variable
FT404I	Stores the result from IMFEXEC FREE in a shared variable

Rules

The Rules for the File Allocation-Deallocation Solution are:

FT401E	Text-ID=FT401E
FT402I	Text-ID=FT402I
FT403E	Text-ID=FT403E
FT404I	Text-ID=FT404I

The Rules are distributed DISABLED in RULESET AAORULC1. In addition to these Rules, you must ENABLE the following Rules: CICSTART, CICSTERM, FT426W, FT425W, and FT435I.

VSAM Control Area Split Monitor Solution

VSAM Control Area splits can cause I/O response times to be extended. This solution assists the operator in monitoring which files are suffering Control Area splits.

Variables and JCL

For the VSAM Control Area Split Monitor Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of MAINVIEW AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLTYPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by a Rule for the following text-ID:

FT092S FILE filename HAS HAD nnn CONTROL AREA SPLITS

Processing Flow

In response to the FT092S message, an ALERT is sent, telling the operator what to do about a VSAM file with several Control Area splits:

```
*FT092S FILE file SHOULD BE RE-DEFINED (nnn C.A. SPLITS)
```

In addition, the CICS MANAGER FILEXPND command is associated with the ALERT. The operator can use the command to display the status of the VSAM cluster.

EXECs

The EXEC for the VSAM Control Area Split Monitor Solution is:

FT092S Handles FT092S message

Rules

The Rule for the VSAM Control Area Split Monitor Solution is:

FT092S Text-ID=FT092S

The Rule is distributed DISABLED in RULESET AAORULC1. In addition to this Rule, you must implement the following Rules: CICSTART, CICSTERM, FT426W, FT425W, and FT435I.

Transaction Response Time Monitor Solution

This solution ensures that operators are aware of transactions exceeding service level objectives.

Variables and JCL

For the Transaction Response Time Monitor Solution to function properly in your environment, you must establish values for the following variables:

FOCALPT	SSID of MAINVIEW AutoOPERATOR subsystem to receive all ALERTs
ONLSYSN	Job name of the target system
ONLCNTN	Subsystem ID of the controlling BBI-SS
ONLALTN	Color for ALERT messages (can be BLUE, WHITE, RED, or GREEN)
ONLTYPN	Type of target or BBI-SS (can be CICS, DB2, IMS, CICS AO, or IMS AO)
ONLALMN	Indicates whether an alarm sounds (can be Y or N)

See Appendix D, “CICS Solution Variables” for information on default settings and initializing the variables.

Invocation

This solution is invoked by a Rule for the following text-ID:

FT094W TRAN tranid HAS EXCEEDED SERVICE LEVEL, nn.nnn IS
 AVG REPSONSE

Processing Flow

In response to FT094W, the ALERT message:

```
*SERVICE LEVELS EXCEEDED, ENTER ON THIS MSG TO SEE  
ACTIVITY
```

is sent. In addition, the CICS MANAGER MONITOR command is associated with the ALERT. The operator can use the command to display service level information in the CICS region.

EXECs

The EXEC for the Transaction Response Time Monitor Solution is:

FT094W Handles FT094W message

Rules

The Rule for the Transaction Response Time Monitor Solution is:

FT094W Text-ID=FT094W

The Rule is distributed DISABLED in RULESET AAORULC1. In addition to this Rule, you must implement the following Rules: CICSTART, CICSTERM, FT426W, FT425W, and FT435I.

Chapter 12 Initial Customization Steps

Before you can take advantage of the automation features of the DB2 Solutions, you must customize your automation environment to accommodate them. You can do this by implementing the solutions described in Chapter 13, “DB2 Global Operations Solutions”. You can then successfully use the other DB2 Solutions. Or you can follow these steps to customize your automation environment to use the DB2 Solutions:

Steps

Follow these steps to customize your automation environment:

Step 1 Customize EXECs

Make these changes to the following EXECs:

EXEC	Change
DSU101C	Change the value specified for variable DB2 to the name of one of your DB2 subsystems.
DSU101C	Verify that the variables MSTR, DBM1, IRLM and DIST correctly identify the names of the started tasks for the DB2 you named.

Note: For the initial install, you can accept the default values for the rest of the variables in this EXEC.

Step 2 Determine number of DB2 subsystems

You can monitor up to nine different DB2 subsystems with the DB2 Solutions. However, changing the number of DB2 subsystems that your BBI subsystem (BBI-SS) monitors requires that you also change the settings of some DB2 variables (See Appendix E, “DB2 Solution Variables and Parameters”).

If your BBI-SS is monitoring more than one subsystem, follow these steps:

- 2.A** Set the value of *n* in `D_DB2NUMn` to the number of DB2 subsystems in `DSU001C`.
- 2.B** Create as many copies of `EXEC DSU101C` as the number of subsystems you plan to monitor and name the copies as follows:
- 2.C** `DSU101C, DSU102C...DSU10nC`
- 2.D** where *n* equals the value of `D_DB2NUM` in step one.
- 2.E** Set each copy's variable to identify a unique DB2 subsystem.
- 2.F** Verify that the following variables' values correctly identify the names of the started tasks for this DB2 subsystem:
 - MSTR
 - IRLM
 - DBM1
 - DIST

Step 3 Update and activate Rules

Rules are initially `DISABLED` with `MAINVIEW AutoOPERATOR Solutions`. You must enable the Rules that affect the solutions you plan to use. In addition, you must update certain parameters in `BBPARM` to reflect the solutions Rules you enabled.

To activate and update DB2 Solutions Rules:

- 3.A** Activate the Rules in each set of Rules for the DB2 Solutions by using a text editor to change `STATUS(DISABLED)` to `STATUS(ENABLED)`.
- 3.B** Enable the Rule for message `PM0010I` found in Rule set `AA0RUL00` of the `AutoOPERATOR` product.
- 3.C** Activate the following DB2 Solutions sets of Rules from the `AAO RULE PROCESSOR` status control panel:

- AAORULD1
- AAORULD2
- AAORULD3
- AAORULD5
- AAORULD6
- AAORULD8

3.D Update the RULESCAN and RULESET parameters in BBPARM member BBISSP00 to reflect the DB2 Solutions Rules and make these sets of Rules permanently active.

Note: A sample is provided in BBPARM member BBISSPD1.

Step 4 Add monitors and EXECs

4.A Add the monitors and time-initiated EXECs for the DB2 Solutions to your startup list, which is specified in BBPARM member BBISSP00 (as shown in the sample provided in BBPARM member BBISSPD1).

4.B Start the monitors and time-initiated EXECs from the AAO Time-Initiated EXEC panel by specifying:

```
BLK=DPE002B
```

and

```
BLK=DPE030B
```

Step 5 Determine threshold levels

When running DB2 applications, DB2 informational messages appear frequently on your console screen. For the DB2RNWY Solution (see “DB2 Runaway Query Control (DB2RNWY Solution)” on page 15-1), the frequency of a message's appearance is directly related to any threshold levels you set before using this solution:

5.A Browse hilevel.BBPARM(DMRBEX00) to review DB2RNWY threshold level parameters.

5.B Browse hilevel.BBPARM(DMRBEXD1) to review the BMC Software recommended settings for these parameters.

5.C Copy member DMRBEXD1 into member DMRBEX00 and set each threshold parameter in DMRBEXD1 to the value of your choice.

Note: If you have more than one DB2 subsystem, you must copy the thresholds for each DB2 TARGET statement.

5.D Put these changes into effect by issuing the command:

```
.E P DMRBEX00
```

from any command line.

Step 6 Modify your ALERT profile

To display the DB2 ALERT Queue on the ALERT Overview application, you must modify your ALERT Profile.

Use the primary command `PROFILE` and set the name of the ALERT Queue to match what you used for the shared variable `D_ALERT_Q`.

Chapter 13 DB2 Global Operations Solutions

The following DB2 Global Operations Solutions provide initialization routines as well as utilities and minimum alert management for DB2.

DB2ALRT	Issues major DB2 messages as MAINVIEW AutoOPERATOR ALERTs
DB2INIT	Provides information about the DB2 complex to other solutions through variables
DMRALRT	Issues major DMR ¹ messages as MAINVIEW AutoOPERATOR ALERTs
DMRUTIL	Provides service routines that convert DMR services to local variables

DMR is a prerequisite for several DB2 Solutions as indicated in the individual solution description.

DB2 Major Messages (DB2ALRT Solution)

During its operations, DB2 issues a number of messages with various severity levels; some of these messages require immediate attention.

The DB2ALRT Solution transforms these messages, listed under “Invocation” into AutoOPERATOR ALERTs, assigning a color to each message based on the severity level of the DB2 problem.

¹DMR refers to MAINVIEW for DB2

Variables

This solution does not require setting any variables.

Invocation

This solution is invoked by Rules for these major DB2 messages:

```
DSN3201I ABNORMAL EOT IN PROGRESS FOR USER= CON-ID= COR-
ID=
DSNB200I UPDATE VVDS FAILED
DSNB204I OPEN OF DATA SET FAILED. DSNAME = dsn
DSNB207I DYNAMIC ALLOCATION OF DATA SET FAILED. REASON =
rrr
        DSNAME = dsn
DSNB217I csect-name - ONLINE RECOVERY FOR AN INCONSISTENT
PAGE
        WAS UNSUCCESSFUL FOR DBNAME = dbn, SPACENAME =
spn,
        PAGE NUMBER = X'pno'
DSNB224I csect-name - BUFFER MANAGER I/O ERROR DURING
function
        DBNAME=dbn, ...
DSNB225I BUFFER MANAGER I/O ERROR
DSNB226I BUFFER MANAGER DETECTED INVALID PAGE
DSNB227I DFHSM RECALL FAILED
DSNB551I BSDS READ ERROR
DSNB552I BSDS WRITE ERROR
DSNB553I BSDS INSERT ERROR
DSNB601I BUFFER POOL nn FULL
DSNB602I UNABLE TO CREATE BUFFERPOOL
DSNB603I INSUFFICIENT STORAGE FOR BUFFERPOOL
EXPAND/CREATE
DSNB605I INSUFFICIENT VIRTUAL STORAGE FOR BUFFERPOOL
DSNB606I INSUFFICIENT STORAGE FOR HIPERPOOL
DSNB607I UNABLE TO CREATE HIPERPOOL - NO EXPANDED
DSNB608I UNABLE TO CREATE HIPERPOOL
DSNB609I VIRTUAL BUFFERPOOL IS ZERO - DEFAULT USED
DSNB610I UNABLE TO CREATE HIPERPOOL - NO ADMF
DSNB611I HIPERPOOL DELETED - ADMF INACTIVE
DSNC001I CICS UR INDOUBT RESOLUTION IS INCOMPLETE FOR
name
DSNC030E ERROR WRITING TO TRANSIENT DS
DSNC034I INDOUBT RESOLUTION FOR ur-id IS INCORRECT
DSNC035I INDOUBT RESOLUTION INCOMPLETE
DSNC036I INDOUBT RESOLUTION FOR ur-id IS INCONSISTENT
DSNC901I UNRECOVERABLE I/O ERROR IN DSNCCOM1
DSNI001I RESTART HAS BEEN DEFERRED
DSNI007I UNABLE TO DIRECT READ A LOG RECORD
```

DSNI010I BROKEN PAGE ACCESSED TYPE type NAME name MODNAME
 csect-name CONN-ID id CORR-ID id
 DSNI012I PAGE LOGICALLY BROKEN TYPE type NAME name
 MODNAME
 modname ERQUAL erqual
 DSNJ004I ACTIVE LOG COPY n INACTIVE, LOG IN SINGLE MODE,
 ENDRBA=...
 DSNJ008E nn OF mm ACTIVE LOGS ARE FULL sname NEEDS
 ARCHIVE
 SCRATCH. REPLY YY WHEN DEVICE READY OR N TO
 CANCEL
 DSNJ013I TERMINAL ERROR ccc IN BUFFER rrr BEFORE ACTIVE
 LOG WRITE
 DSNJ014I TERMINAL ERROR ccc IN BUFFER rrr AFTER ACTIVE
 LOG WRITE
 DSNJ073I LOG ARCHIVE UNIT ALLOCATION FAILURE DETECTED,
 RETURN CODE = nnnn. ALLOCATION OR OFF-LOAD OF
 ARCHIVE
 LOG DATA SET MAY FAIL
 DSNJ100I csect-name ERROR OPENING BSDSn DSNAME=..., ERROR
 STATUS=...
 DSNJ102I LOG RBA CONTENT OF LOG DATA SET DSNAME=...
 STARTRBA=..
 ENDRBA=.. DOES NOT AGREE WITH BSDS INFORMATION
 DSNJ103I LOG ALLOCATION ERROR DSNAME=dsname, ERROR
 STATUS=eeeeiiii
 DSNJ104I csect-name RECEIVED ERROR STATUS nnn FROM macro-
 name
 FOR DSNAME dsname
 DSNJ105I csect-name LOG WRITE ERROR DSNAME=...,
 LOGRBA=...,
 ERROR STATUS=ccccffss
 DSNJ106I LOG READ ERROR DSNAME=..., LOGRBA=...,
 ERROR STATUS=ccccffss
 DSNJ107I READ ERROR ON BSDS DSNAME=... ERROR STATUS=...
 DSNJ108I WRITE ERROR ON BSDS DSNAME=... ERROR STATUS=...
 DSNJ109I OUT OF SPACE IN BSDS DSNAME=...
 DSNJ110E LAST COPYn ACTIVE LOG DATA SET IS nnn PERCENT
 FULL
 DSNJ111E OUT OF SPACE IN ACTIVE LOG DATA SETS
 DSNJ115I OFFLOAD FAILED FOR ARCHIVE
 DSNJ117I INITIALIZATION ERROR READING BSDS DSNAME=...,
 ERROR STATUS=...
 DSNJ120I DUAL BSDS DATA SETS HAVE UNEQUAL TIME STAMPS,
 BSDS1
 SYSTEM=..., UTILITY=..., BSDS2 SYSTEM=...,
 UTILITY=...
 DSNJ124I OFFLOAD OF ACTIVE LOG SUSPENDED FROM RBA xxxx TO
 RBA
 yyyy DUE TO I/O ERROR
 DSNJ126I BSDS ERROR FORCED SINGLE MODE
 DSNJ150E LOG CAPTURE EXIT ABEND

```
DSNL007I DDF IS ABNORMALLY TERMINATING
DSNL033I DDF TERMINATION BECAUSE OF ABEND
DSNL400E INDOUBT THREAD HEURISTIC DAMAGE
DSNL401E INDOUBT THREAD REMOTE ABORT - HEURISTIC DAMAGE
DSNL402I INDOUBT THREAD REMOTE COMMIT - HEURISTIC DAMAGE
DSNL403I INDOUBT THREAD REMOTE ABORT - HEURISTIC DAMAGE
DSNL404E PROTOCOL ERROR
DSNL405I THREAD PLACED INDOUBT
DSNL406I THREAD MAY BE INDOUBT - COMM FAILURE
DSNL408I INDOUBT THREAD HEURISTIC DAMAGE - COORDINATOR
DSNL409I INDOUBT THREAD HEURISTIC DAMAGE - COORDINATOR
DSNL411E COLD START BY COORDINATOR - MANUAL RESOLUTION
DSNL412I PROTOCOL ERROR DURING SYNCHPOINT
DSNL413I PROTOCOL ERROR DURING SYNCHPOINT
DSNL414E PROTOCOL ERROR DURING INDOUBT
DSNL420I COLD START BY PARTICIPANT - POSSIBLE DAMAGE
DSNL421I SNA XLN PROTOCOL VIOLATION
DSNL500I CONVERSATION FAILED TO LOCATION locname ...
DSNL501I CNOS PROCESSING FAILED
DSNL502I SYSTEM CONVERSATION FAILED TO LOCATION=locname
...
DSNM002I IMS/V S xxxx DISCONNECTED FROM SUBSYSTEM yyyy
RC=rc
DSNM004I RESOLVE INDOUBT ENTRY(S) ARE OUTSTANDING FOR
SUBSYS xxxx
DSNM005I RESOLVE INDOUBT SYNCHRONIZATION PROBLEM WITH
SUBSYS xxxx
DSNP001I DSNPmmmm - dsn IS WITHIN n KBYTES OF AVAILABLE
SPACE
          RC=r CONNECTION-ID=id CORRELATION-ID=id
DSNP007I DSNPmmmm - EXTEND FAILED FOR dsn
          RC=r CONNECTION-ID=id CORRELATION-ID=id
DSNP011I DSNPmmmm - MEDIA MANAGER SERVICES ERROR FOR dsn.
MMRC=C
          DSMRC=r CONNECTION-ID=id CORRELATION-ID=id
DSNP012I DSNPmmmm - ERROR IN VSAM CATALOG LOCATE FUNCTION
FOR dsn
          CTLGRC=r CTLGRSN=r CONNECTION-ID=id CORRELATION-
ID=id
DSNP015I IRLM MANUAL UNLOCK FAILED
DSNP028I HSM RECALL FAILED
DSNT377I PLAN plan-id1 WITH CORRELATION ID id1 CONNECTION
ID id2
          IS IN CONFLICT WITH AN INDOUBT THREAD
DSNT500I csect-name RESOURCE UNAVAILABLE REASON r TYPE t
NAME n
DSNT501I csect-name RESOURCE UNAVAILABLE CORRELATION-ID
id1
          CONNECTION-ID id2 REASON r TYPE t NAME n
DSNV086E DB2 ABNORMAL TERMINATION REASON=xxxxxxxx
```

```
DXR013E ABEND UNDER IRLM TCB/SRB
DXR016E BUCK PROCESS TIME EXCEEDS 30 SECONDS
DXR019E STORAGE POOL DESTROYED
DXR021E ABEND VTAM ERROR
DXR022E SUBTASK FAILURE
DXR023E INTERNAL OR MVS ERROR
DXR024E VTAM REQUEST UNSUCCESSFUL
DXR027A SESSION LOST
DXR031E ABEND UNDER PTB SRB
DXR050I OUT OF STORAGE DETECTED DURING DEADLOCK
```

Processing Flow

When any message listed under “Invocation” on page 13-8 is received, an ALERT is issued. Color has been assigned to each ALERT based on the known severity of the attached message.

EXECs

There is one EXEC for this solution:

DPE992C Creates an ALERT for any message that invokes DPE992C

Rules

There is one Rule for each of the messages listed under “Invocation” on page 13-8.

The Rules are distributed DISABLED in RULESET AAORULD8. You must ENABLE these Rules to implement this solution.

DB2 Environment Set-Up (DB2INIT Solution)

Before you use the DB2 Solutions, you must provide some descriptive information about the DB2 subsystems you plan to use. This section describes how you provide this information to your automation environment.

Note: For additional information about customization steps affecting all solutions, see Chapter 12, “Initial Customization Steps”.

Variables

To use DB2INIT, you must establish values for both the general DB2 variables and the DB2 subsystem variables as follows:

General DB2 variables:

D_ALERT_TGT

Target to receive ALERTS

D_ALERT_Q

Name of the ALERT queue for all ALERTS generated by the solutions

D_ALERT_IDS

TSO IDs to receive notification of ALERTS through TSO SEND commands

D_ALERT_SEND

Indicates whether to issue the send command (Y/N)

D_ALERT_SENDOPT

MVS SEND option; either LOGON or NOW

D_DB2NUM

Number of DB2s defined to this BBI-SS

Set these variables by modifying EXEC DSU001C. For a complete list of all the DB2 Solutions variables, see Appendix E, “DB2 Solution Variables and Parameters”.

For the DB2 subsystems variables, one set of the following variables should be defined for each DB2 system you intend to control through solutions:

D_DB2n	nth DB2 target name
D_MSTRn	nth DB2 MSTR address space name
D_DBM1n	nth DB2 DBM1 address space name
D_IRLMn	nth DB2 IRLM address space name
D_DISTn	nth DB2 DIST address space name

Set these variables by modifying EXEC DSU10 n C, where n is the number of the associated DB2 subsystem. If you start more than one DB2 subsystem, you must duplicate the sample EXEC DSU101C provided. Other EXECs, up to DSU105C, are included with only the comments box.

Note: If you try to display the DB2 variables names and content using the AutoOPERATOR facilities, be aware that there might be several DB2 subsystems.

Invocation

As seen in “Variables” on page 13-6, DB2INIT consists of EXEC DSU001C and one or several EXECs DSU10 n C. You should ensure that these EXECs run as soon as possible after the host BBI-SS has been started.

This type of request usually is honored by having a Rule for PM0010I, which is the primary AutoOPERATOR message. This Rule should initiate some kind of start-up EXEC. You need to add the necessary calls to EXECs found in “Variables” on page 13-6 to that start-up EXEC, such as:

```
IMFEXEC SELECT EXEC(DSU001C) WAIT(Y)
```

Processing Flow

Solution DB2INIT is executed only once—at BBI-SS start-up. If you need to run DB2INIT dynamically (such as the first time, or after a variable change), you can call the processing EXECs from any AutoOPERATOR workstation.

EXECs

The EXECs for the DB2INIT Solution are:

DSU001C	Initializes shared variables for solutions
DSU10nC nC	Initializes shared variables for a particular DB2 subsystem where n is the number of DB2 subsystems monitored by this BBI-SS

Rules

There is no Rule for the DB2INIT Solution.

DMR Major Messages (DMRALRT Solution)

MAINVIEW for DB2 (DMR) is one of the major components of MAINVIEW. It provides DB2-related performance information for the system programmer and the Database Administrator.

Several DMR components issue messages with various severity levels. DMR experts have sorted out these messages and selected a set of those requiring immediate attention. In fact, only the messages reported as *severe exceptions* have been retained, along with their associated *clearing* message.

The DB2 solutions were developed from a subset of those DMR messages—those considered to be candidates for automation.

The remaining messages are listed following “Invocation”. DMRALRT transforms the messages in this set into AutoOPERATOR alerts, assigning a color to each message based on the severity level of the DMR problem.

Note: DMRALRT applies only when MAINVIEW for DB2 is installed.

Variables

For this solution to function properly in your environment, you must establish values for the general DB2 variables and the DB2 subsystems variables defined in the DB2INIT solution.

Invocation

This solution is invoked by Rules for these major DMR messages:

DZ1010S - INDOUBT THREAD

DZ1011I - EXCEPTION CLEARED: INDOUBT THREAD

DZ1040S - EDM POOL FULL FAILURES

DZ1041I - EXCEPTION CLEARED: EDM POOL FULL FAILURES

DZ1050S - BP(n) DM CRITICAL THRESHOLD REACHED

DZ1051I - EXCEPTION CLEARED: BP(n) DM CRITICAL THRESHOLD REACHED

DZ1060S - BP(n) IMMEDIATE WRITE THRESHOLD REACHED

DZ1061I - EXCEPTION CLEARED: BP(n) IMMEDIATE WRITE THRESHOLD REACHED

DZ1070S - BP(n) EXPANSION FAILURE, MAXPAGES REACHED

DZ1071I - EXCEPTION CLEARED: BP(n) EXPANSION FAILURE, MAXPAGES REACHED

DZ1080S - BP(n) EXPANSION FAILURE, VIRTUAL STORAGE SHORTAGE

DZ1081I - EXCEPTION CLEARED: BP(n) EXPANSION FAILURE, VIRT. ST. SHORTAGE

DZ1090S - FINAL ACTIVE LOG DATASET 75% FULL

DZ1091I - EXCEPTION CLEARED: FINAL ACTIVE LOG DATASET 75% FULL

DZ1100S - ACTIVE LOG REDUCED TO SINGLE MODE

DZ1101I - EXCEPTION CLEARED: ACTIVE LOG REDUCED TO SINGLE MODE

DZ1110S - BSDS REDUCED TO SINGLE MODE

DZ1111I - EXCEPTION CLEARED: BSDS REDUCED TO SINGLE MODE

DZ1120S - SOS CRITICAL

DZ1121I - EXCEPTION CLEARED: SOS CRITICAL

Processing Flow

When any problem message is received, an ALERT is issued. Color has been assigned to each ALERT based on the known severity of the attached message. When any clearing message is received, the ALERT is cleared.

EXECs

There is one EXEC for this solution:

DPE994C Issues or deletes the ALERT associated with any of the DMR messages found in "Invocation"

Rules

There is one Rule for each of the messages given in “Invocation”. The Rule-IDs equal the message-IDs.

The Rules are distributed DISABLED in RULESET AAORULD3. You must ENABLE these Rules to implement this solution.

DMR Utilities (DMRUTIL Solution)

MAINVIEW for DB2 (DMR) is one of the major components of MAINVIEW. It provides DB2-related performance information for the system programmer and the Database Administrator (DBA).

With the MAINVIEW architecture, MAINVIEW AutoOPERATOR and DMR can communicate internally. This provides great power by letting the solutions investigate what is happening within DB2. This communication is based on an internal exchange of the regular DMR screen image in reply to a received command.

To shorten development time, service routines are provided for the major DMR services, which let you get direct DB2 data from local variables. These routines are included in the DMRUTIL Solution.

Note: DMRUTIL applies only when MAINVIEW for DB2 is installed.

Variables

This solution does not require any value to be set for variables.

Invocation

The EXECs from this solution are called by the various DB2 Solutions. Therefore, any DMR-based solution requires DMRUTIL.

EXECs

Following are the EXECs for the DB2UTIL Solution. Each utility EXEC is completed by an example on how to call it.

DPE002C	Support for BFRPL format in DB2 3.1
DPE014C	Start trace TYPE=D
DPE900C	DB2ST formatter — breaks DB2ST display into variables
DPE900D	Driver example for DPE900C and DPE901C
DPE901C	USERS formatter — breaks USERS display into variables
DPE901D	Driver example for DPE901C
DPE902C	Breaks DB2EX display into variables
DPE902D	Driver example for DPE902C
DPE903C	Breaks LOCKD display into variables
DPE903D	Driver example for DPE903C
DPE905C	BFRPL formatter — breaks BFRPL display into variables
DPE905D	Driver example for DPE905C
DPE908C	DBTS formatter — breaks DBTS display into variables
DPE908D	Driver example for DPE908C
DPE908DR	Driver for DPE908C (written in REXX)
DPE909C	IMFC call (IMAGE=NO)
DPE917C	Breaks BFRPL display into variables (DB2 release 2.3) and makes BFRPL variables compatible for DPE002C
DPE919C	Fixed column positions for DBTS display
DBE920C	DB2ST formatter
DPE930C	DB2ST formatter — breaks DB2ST display into variables (DB2 release 2.3)
DPE931C	USERS formatter — breaks USERS display into variables (DB2 release 3.1)

DPE932C	DLOGS formatter — breaks DLOGS display into variables (DB2 release 3.1)
DPE933C	DBTS formatter — breaks DBTS display into variables (DB2 release 3.1)
DPE935C	BFRPL formatter — breaks BFRPL display into variables (DB2 release 3.1)

Rules

There are no Rules attached to this solution.

Chapter 14 DB2 Resource Contention Analysis Solutions

The following DB2 Resource Contention Analysis Solutions concentrate on a few major resources that are critical to DB2 operations:

DB2DLOK	Analyzes deadlock or timeout situations
DB2TFUL	Provides an early warning of table spaces filling up
DB2THRD	Resolves IMS and CICS queued for thread situations

Deadlock/Timeout Analysis (DB2DLOK Solution)

A *timeout* occurs when the length of time a user has been waiting for a lock exceeds the IRLM timeout limit.

A *deadlock* occurs when two or more users have requested locks for two or more resources and each user has a lock that the other needs.

If these events occur frequently, consider redesigning the data structure or application.

For DB2DLOK, the PLAN that was waiting for a lock on a resource is called the *lock requestor*. The PLAN that held the lock is called the *lock owner*. The lock owner continues to run normally; the lock requestor receives a negative SQL return code.

Note: DB2DLOK requires MAINVIEW for DB2.

Variables

To use DB2DLOK, you must establish values for the general DB2 variables and the DB2 subsystem variables defined in the DB2INIT Solution.

You should also define values for the following thresholds:

- MAX_AGE** The age in minutes of the oldest event to be used for threshold comparison. For example, if MAX_AGE = 30, then an event that occurred 31 minutes ago is not used for threshold checking. This limits the problem analysis to recent history. To include all events that are saved in the history table, set MAX_AGE = 0. The default is MAX_AGE = 30.
- MAX_OWNER** Triggers an ALERT if a PLAN is a lock owner more than MAX_OWNER times in MAX_AGE minutes. The default is 2, so a PLAN has to be a lock owner 3 or more times to trigger the ALERT.
- MAX_REQ** Triggers an ALERT if a PLAN is a lock requestor more than MAX_REQ times in MAX_AGE minutes. The default is 2, so a PLAN has to be a lock requestor 3 or more times to trigger the ALERT.
- MAX_EITHER** Triggers an ALERT if a PLAN is involved in locking conflicts either as a lock owner or lock requestor more than MAX_EITHER times in MAX_AGE minutes. This threshold is checked only if the PLAN did not exceed the MAX_OWNER or MAX_REQ thresholds. The default is 3. For example, if a PLAN is a lockowner 2 times and a lock requestor 2 times, an ALERT is issued.

These variables should be set by reviewing EXECs DSU10nC, attached to initializing values pertaining to each specific DB2. These EXECs are included in the DB2INIT Solution.

Invocation

This solution is invoked by Rules for the following messages:

DSNT375I PLAN **plan-id1** WITH CORRELATION-ID **id1** CONNECTION-ID **id2** LUW-ID **id3** IS DEADLOCKED WITH PLAN **plan-id2** WITH CORRELATION-ID **id4** CONNECTION-ID **id5** LUW-ID **id6**

DSNT376I PLAN **plan-id1** WITH CORRELATION-ID **id1** CONNECTION-ID **id2** LUW-ID **id3** IS TIMED OUT DUE TO A LOCK HELD BY PLAN **plan-id2** WITH CORRELATION-ID **id4** CONNECTION-ID **id5** LUW-ID **id6**

DSNT501I Csect-name RESOURCE UNAVAILABLE CORRELATION-ID **id1** CONNECTION-ID **id2** LUW-ID **id3** REASON **reason** TYPE **type** NAME **name**

Processing Flow

The first part of this solution maintains a history table of deadlock and timeout events for each DB2 user. Each time a new event is added to the table, an analysis is done of the history table to see whether any PLAN has exceeded any threshold for contention.

History Table

By running EXEC DPE019C, you can display the deadlock history table at any time. This wrap-around table shows all previously recorded deadlock and timeout events. Once the table is full, a new event takes the place of the oldest event in the table. DPE019C writes two reports to the journal.

Report 1: The first DPE019C report is a display of all the events saved in the deadlock table. It starts with the most current event and ends with the oldest event:

```
..DPE019C DEADLOCK/TIMEOUT HISTORY FOR DB2 FOLLOWS
```

DATE	TIME	TYPE	LOCK	PLAN	CONN-ID	CORR-ID
95.031	11:11:11	(1)	OWNR	(2)	(3)	(4)
			REQR	(5)	(6)	(7)
			NAME	(8)		

Numbered data items are:

- (1) Event type - either TIMEOUT or DEADLOCK
- (2) Plan name of lock owner
- (3) Connection-ID of lock owner
- (4) Correlation-ID of lock owner
- (5) Plan name of lock requestor
- (6) Connection-ID of lock requestor
- (7) Correlation-ID of lock requestor
- (8) Resource name in contention (from DSNT501I)

Report 2: The second report from DPE019C summarizes the events by PLAN and counts events above and below the MAX_AGE threshold:

```
..DPE019C DEADLOCK/TIMEOUT SUMMARY FOR xxxx
..DPE019C MAX_AGE = nnn MINUTES
```

DB2	PLAN	LOCKOWNR < MAX_AGE	LOCKOWNR TOTAL	LOCKREQR < MAX_AGE	LOCKREQR TOTAL
1	2	3	4	5	6

- (1) target DB2 (whose subsys ID is xxxx)
- (2) DB2 PLAN
- (3) number of times the PLAN was a lock owner within the last &MAXAGE minutes
- (4) total number of times the PLAN was a lock owner
- (5) number of times the PLAN was a lock requestor within the last &MAXAGE minutes
- (6) total number of times the PLAN was a lock requestor

You can use this report to adjust your thresholds.

ALERTs

If a threshold is exceeded, DB2DLOK creates an ALERT that details all the conflicting events for the plan in question and writes a message in the journal. You also can choose to notify a select group of TSO users.

From the ALERT, you can request a report of all deadlock events, request that a detail trace be started, or start a LOCKD data extractor EXEC. This is documented in the ALERT help panel.

Entering the EXT command in the ALERT RSP field invokes EXEC DPE015C. DPE015C examines the LOCKD display periodically and looks for lock contentions where this PLAN is a lock owner. When complete, a report of all contentions is written to the journal, followed by a summary by database and table space.

- The variable STOPTIME determines how long the EXEC runs (default of 10 minutes, set in DSU10nC)
- The variable INTVL determines how long the EXEC waits between LOCKD displays (default of 5 seconds, set in DSU10nC)

Data Extractor

The LOCKD data extractor (EXEC DPE015C) writes two reports to the journal.

Report 1: The first report is a history report of all the events found:

```
DPE015C &DB2 LOCK EXTRACTION HISTORY FOR PLAN &PLAN
FOLLOWS.
DPE015C &DB2 &MAX EVENTS FOUND IN THE LAST &STOPTIME
MINUTES.
```

TIME	DB	TS	USERID	CNT	WAITER	TYPE
1	2	3	4	5	6	7

(1) HH:MM:SS that the locking conflict was observed

(2) Database in conflict

(3) Table space in conflict

(4) User ID owning the lock

(5) Count of lock waiters

(6) User ID of the first waiter

(7) Waiter type

For a further explanation of the above fields, consult the *MAINVIEW for DB2 User Guide* for the LOCKD service.

Report 2: The second report from DPE015C is a summary of the above events by DB/TS.

```
DPE015C &DB2: LOCK EXTRACTION REPORT BY DB/TS FOR PLAN
&PLAN
DPE015C OVER THE LAST &STOPTIME MINUTES FOLLOWS:
```

DATABASE	TBLSPACE	# EVENTS
-----	-----	-----
1	2	3

(1) Database held in conflict by PLAN &plan

(2) Table space held in conflict by PLAN &plan

(3) Number of times this DB/TS was held in conflict by PLAN &plan

EXECs

The EXECs for the DB2 Deadlock/Timeout Solution are:

DPE010C	Determines DB2 target and plans involved in deadlocks or timeouts
DPE011C	Performs deadlock history update
DPE012C	Updates resource name in history table, then checks against thresholds; issues ALERTS/MSGS and optional MVS SEND commands
DPE013C	Follow-up EXEC for ALERT
DPE014C	Starts trace
DPE015C	Analyzes LOCKD display
DPE019C	Reports deadlock history table to journal

Rules

The Rules for the DB2 Deadlock/Timeout Analysis Solution are distributed in member AAORULD1:

DSNT375I Text-ID=DSNT375I, distributed DISABLED

DSNT376I Text-ID=DSNT376I, distributed DISABLED

DSNT501X Text-ID=DSNT501I, distributed DISABLED, applied to message DSNT501I only when the CSECT name is DSNILMCL.

The Rules are distributed DISABLED in RULESET AAORULD1. You must ENABLE these Rules to implement this solution.

DB2 Table Space Filling Up (DB2TFUL Solution)

Many users access DB2 databases during the day, and some users might continue to add data until they run out of space.

When DB2 reports that all the space has been used up, it is too late to avoid an outage. DB2TFUL provides an early warning of a table space or a partition filling up.

DB2TFUL analyzes open table spaces and imposes user-specified thresholds on them. If a threshold is exceeded, an ALERT is issued.

Looking at many DB2 databases takes time and resources, so the attached analysis is run only every half-hour, through a timer request you set in AutoOPERATOR.

Note: DB2TFUL requires MAINVIEW for DB2.

Variables

To use DB2TFUL, you must establish values for the general DB2 variables and the DB2 subsystem variables defined in the DB2INIT Solution.

Additionally, you can define values for the following thresholds:

MAX_EXTS	The upper bound for the number of extents for a tablespace unless overridden by an exception. If zero, this threshold is ignored.
MAX_UTIL	The upper bound for the percent utilization for a tablespace unless overridden by an exception. If zero, this threshold is ignored.
NUM	Number of exceptions for this DB2. Must be equal to the highest suffix for variable NAME.
NAMEn	The name of the n th exception. Must be specified as a tablespace. Can be generic.
MAX_EXTSn	The extent threshold for the n th exception name. If zero, this threshold is ignored.
MAX_UTILn	The utilization threshold for the n th exception name. If zero, this threshold is ignored.

The above variables should be set by reviewing EXEC DSU10nC, attached to initializing values pertaining to each specific DB2 subsystem. These EXECs are included in the DB2INIT Solution.

For example, suppose the following variables are set in EXEC DSU101C:

```
SET MAX_EXTS = 0
SET MAX_UTIL = 0

SET NUM      = 2

SET NAME1    = &STR(DSN*)
SET EXTS1    = 15
SET UTIL1    = 0

SET NAME2    = &STR(DSNDBO6_SYS*)
SET EXTS2    = 5
SET UTIL2    = 90
```

Setting both MAX_EXTS and MAX_UTIL to zero tells the solution to check only the exception thresholds.

The first exception states that any tablespace in a database starting with DSN that has more than 15 extents creates an ALERT.

The second exception states that an ALERT is generated for any tablespace starting with SYS in database DSNDB06 that has more than 5 extents or is over 90% utilized on the fifth extent.

Invocation

Usually, DB2TFUL is initiated through a time-initiated request. A sample timer is provided in BBPARM member DPE030B. You also should create a call to this timer in your BBIISPx member. A sample entry is provided in BBPARM member BBIISPD1.

Processing Flow

This solution is intended to run in the background, using the timer facility described previously in “Invocation”, and to sample data periodically. However, both DPE030C and DPE031C can be executed from any command line of any MAINVIEW screen display by using the command character % (percent sign).

EXECs

The EXECs for the DB2TFUL Solution are:

DPE030C Threshold analysis of the DBTS display for a particular DB2

DPE031C The EXEC that calls EXEC DPE030C for each defined DB2

Rules

There are no Rules for this solution.

DB2 Thread Control (DB2THRD Solution)

DB2 offers its users a number of access paths, referred to as *threads*. DSNZPARM specifies the maximum number of threads DB2 can have. When this limit is reached, DB2 queues each request until a thread is available. Once this queuing process is initiated, it causes delays to users.

For transaction-oriented systems such as IMS and CICS, waiting for a DB2 thread can degrade the throughput of the entire system and should be avoided.

In a data center using DB2, users often encounter a shortage of threads. In response to this situation, the DB2THRD Solution attempts to identify a TSO thread that can be made available for IMS or CICS to use.

Note: DB2THRD requires MAINVIEW for DB2.

Variables

To use DB2THRD, you must establish values for the general DB2 variables and the DB2 subsystem variables defined in the DB2INIT Solution.

Additionally, you should define the following variable:

Q_VERIFY Indicates (Y/N) whether to issue an ALERT to verify the TSO cancel.

Invocation

This solution is invoked by Rules for these major DMR messages:

```
DZ1020S - IMS TASK(S) QUEUED FOR THREAD
DZ1021I - EXCEPTION CLEARED: IMS TASK(S) QUEUED FOR
THREAD
DZ1030S - CICS TASK(S) QUEUED FOR THREAD
DZ1031I - EXCEPTION CLEARED: CICS TASK(S) QUEUED FOR
THREAD
```

Processing Flow

If `Q_VERIFY = Y`, then an ALERT is created when the message DZ1020W or DZ1030W appears. This ALERT has an extended help panel (DPE040A) associated with it that can be modified by your site to give the operator-specific instructions for this situation. When the queued for thread condition clears, the solution intercepts messages DZ1021I and DZ1031I and deletes the ALERT.

If `Q_VERIFY = N`, then EXEC DPE041C is invoked to identify the TSO user with the shortest elapsed time. EXEC DPE040C then cancels that TSO user so that a thread can be freed up for CICS or TSO to use. A message is written to the journal identifying the canceled TSO user.

EXECs

The EXECs for the DB2THRD Solution are:

- | | |
|----------------|---|
| DPE040C | Analyzes message it has been scheduled from |
| DPE041C | Analyzes DMR USERS service output to locate the TSO user to be canceled |

Rules

There is one Rule for each of the messages listed under “Invocation”. The Rule-IDs equal the message-IDs.

The Rules are distributed DISABLED in RULESET AAORULD6. You must ENABLE these Rules to implement this solution.

Chapter 15 DB2 Performance Management Solutions

The following DB2 Performance Management Solutions help data center personnel achieve maximum availability and increased response time:

DB2RNWY Reacts to DMR messages for CICS, IMS, TSO, Batch, CAF, and Utilities runaway queries

Note: DMR refers to MAINVIEW for DB2

DB2RESP Uses DMR services to identify potential causes of poor DB2 response time

DMR is a prerequisite for several DB2 Solutions as indicated in the individual solution description.

DB2 Runaway Query Control (DB2RNWY Solution)

Runaway queries are one of the major problems affecting DB2 performance. MAINVIEW for DB2 dynamic and static SQL calls and warning capabilities made it possible to develop the DB2RNWY Solution, which provides selective cancel capabilities over such runaway queries.

This solution requires:

- MAINVIEW for DB2
- AutoOPERATOR for IMS and IMS RESOURCE ANALYZER (to cancel a runaway IMS query)

- CICS AutoOPERATOR (to cancel a runaway CICS query)

Note: DB2 provides limited protection from runaway queries with the Resource Limit Facility (RLF), available with DB2 Version 2.1. However, this applies only to dynamic SQL. Moreover, the result from RLF is a query that has stopped with an SQL error code (-905 expected).

Variables

To use DB2RNWY, you must establish values for the global DB2 variables defined in the DB2INIT Solution.

Invocation

This solution is invoked by Rules for the following messages:

```
DZ0610W RUNAWAY IMS <threshold> PST= TRAN= USER= J= TYPE= CRGN=  
DZ0611I EXCEPTION CLEARED: RUNAWAY IMS ...  
DZ0620W RUNAWAY CICS TRANSACTION USER=u <threshold> J= TRAN= TASK=  
DZ0621I EXCEPTION CLEARED: RUNAWAY CICS TRANSACTION ...  
DZ0630W RUNAWAY TSO QUERY USER= <threshold exceeded>  
DZ0631I EXCEPTION CLEARED: RUNAWAY TSO QUERY ...  
DZ0640W RUNAWAY BATCH USER= <threshold exceeded> J=  
DZ0641I EXCEPTION CLEARED: RUNAWAY BATCH ...  
DZ0650W RUNAWAY CAF, USER= <threshold exceeded> J=  
DZ0651I EXCEPTION CLEARED: RUNAWAY CAF ...  
DZ0660W RUNAWAY UTILITY FUNCTION, USER= <threshold exceeded> J=  
DZ0661I EXCEPTION CLEARED: RUNAWAY UTILITY ...
```

Processing Flow

When MAINVIEW for DB2 detects a runaway query, as determined by thresholds set in BBPARM member DMRBEX00, a message is sent to the LOG and filtered to be echoed as an ALERT on the MAINVIEW centralized screen. A sample member named DMRBEXD1 is provided in the BBPARM data set.

Operators must confirm the cancel of a runaway query job by entering CAN in the response field for the ALERT; the ALERT is cleared when the operator cancels the runaway query job, or when the runaway condition ends.

If the runaway query is:

- A job or TSO user, the cancel is done through the appropriate MVS cancel command.
- An IMS region, the solution verifies that the region name, number, and trancode match those in the warning message and that the region status is ACTV-USR or ACTV-DB2. It then issues a /STOP REG ABDUMP command followed by a /STOP REGION CANCEL command.
- A CICS transaction, the solution issues a KILL TASK *xxxx* FORCE.

Note: This solution does not cancel a runaway query automatically. It always requests operator agreement by the ALERT.

EXECs

The EXECs for the DB2 Runaway Query Control Solution are:

DPE020C	Create ALERTs for runaway query
DPE021C	Delete ALERTs for runaway query
DPE022C	Schedules MVS cancel EXEC DPE024C
DPE023C	Schedules IMS cancel EXEC DPE025C
DPE024C	Performs MVS cancel
DPE025C	Performs IMS cancel
DPE026C	Schedules CICS cancel EXEC DPE027C
DPE027C	Performs CICS cancel

Rules

The Rules are distributed DISABLED in RULESET AAORULD2. You must ENABLE these Rules to implement this solution.

DB2 Response Time (DB2RESP Solution)

Because transaction response time for all CICS, IMS, and TSO users relies on DB2's ability to reply to requests in the shortest possible time, it is important to obtain data about DB2 response time as early as possible.

This solution examines several MAINVIEW for DB2 (DMR) services for potential performance problems by comparing the observed values to user-defined thresholds and by reporting any observations that are above threshold levels.

DB2RESP is initiated by certain warning messages for elapsed and CPU time monitors or invoked directly by the operator.

The usefulness of this solution depends in large part on the thresholds chosen, so these must be chosen carefully. BMC Software has supplied what seem to be reasonable defaults with this solution, but you may want to make some modifications to fit your installation.

In the process of determining your installation thresholds, you should become aware of the DMR data items that are good performance indicators for your system.

This solution requires the DB2INIT and DMRUTIL Solutions.

Variables

To use DB2RESP, you must establish values for the general DB2 variables and the DB2 subsystem variables defined in the DB2INIT Solution.

This solution makes extensive use of thresholds for many domains of DB2 performance. For each DB2 subsystem, up to 35 important figures are analyzed. You can change any of the default thresholds. They are available for each DB2 system, and are located in the DSU10nC EXECs.

For more information on setting these threshold parameters, see Appendix E, "DB2 Solution Variables and Parameters".

Invocation

This solution is invoked by Rules for these DMR messages:

```
DW0120W (nn) hh:mm: AVG ELAPSED TIME(parm) = nnn (>ppp) *****
DW0150W (nn) hh:mm: AVG ELAPSED IN DB2(parm) = nnn (>ppp) *****
DW0180W (nn) hh:mm: AVERAGE CPU USED(parm) = nnn (>ppp) *****
DW0190W (nn) hh:mm: AVERAGE CPU IN DB2(parm) = nnn (>ppp) *****
```

where:

parm
{ ALL|IMS|CICS|TSO }

To get these messages out of MAINVIEW for DB2, you must activate some monitors as listed in member DPE002B of the BBPARM data set. This is done in BBPARM member BBIISPxx using the TARGET statement, as shown in BBIISPD1 of BBPARM. For example, to set the DB2 monitors, specify:

```
TARGET=DB2D, BLK=DPE002B, USRID=xxxxxxxx
```

You should adjust the WVAL values to values appropriate to your installation. Information about WVAL values can be found in the “Set Timer Request” chapter of the *MAINVIEW for DB2 User Guide*.

DB2RESP processes warning messages with an identifier of IMS, CICS, TSO, or ALL. These identifiers are required and cannot be modified.

Processing Flow

Occurrence of the DMR messages listed under “Invocation” on page 15-5 invokes DB2RESP, or you can invoke DB2RESP from any MAINVIEW command line by entering:

```
%DPE002C db2name
```

Here, db2name is the name of the target DB2.

Online Help is available by entering:

```
%DPE002C ?
```

The positional parameters for DPE002C are:

PARM1	DB2 TARGET (REQUIRED)
PARM2	OUTPUT DESTINATION (OPTIONAL)DEFAULT = DB2 TARGET
PARM3	CONNECTION TYPE (OPTIONAL)

Values can be: ALL(default), IMS, CICS, or TSO.

EXECs

The EXECs for the DB2RESP Solution are:

DPE002C	Performs checking of thresholds for DB2
DPE005C	Drives DPE002C from DB2 monitor messages
DPE007C	Governor for solution-driven from monitor warning message

Rules

There is one Rule for each of the messages listed under “Invocation” on page 15-5. The Rule-IDs equal the message-IDs.

The Rules are distributed DISABLED in RULESET AAORULD5. You must ENABLE these Rules to implement this solution.

Chapter 16 E-Mail Solution

MAINVIEW AutoOPERATOR provides a pair of sample EXECs that can be used to send an e-mail from a REXX EXEC.

EXECs

The EXECs for the e-mail Solution are:

QAOSMTP1 Resides in BBSAMP.

QAOSMTP2 Resides in BBPROC.

Note: Browse the AutoOPERATOR product libraries to view the most current version of these sample EXECs. BMC Software might ship PTFs at any time to enhance them.

This SMTP sample uses REXX sockets, which are part of the IBM TCP/IP product.

QAOSMTP1

QAOSMTP1 is a sample EXEC that demonstrates how you can pass e-mail data to QAOSMTP2, which performs the actual e-mail transmission. Most customers will be able to use QAOSMTP2 without modification.

To send an e-mail, make a copy of QAOSMTP1 and store it in UBBPROC using a new meaningful name. Replace the data in the user-input fields with appropriate data for your installation.

You can also incorporate the logic in QAOSMTP1 into your own REXX application to generate e-mails.

The areas that need to be modified in QAOSMTP1 are listed in the following table.

Name	Description
SMTP_SERVER	Local mail server. This server distributes mail to the POP3 and Exchange mail servers.
SMTP_REPLYTO	The e-mail address that receives replies when responding to this e-mail. It must be a valid address (or example, YourName@your-company.com).
Sender of the e-mail	The first line queued (your name), which might be different from the REPLYTO e-mail ID. Valid formats are dependant upon the mail server being used. Most mail servers accepts '<user@your-company.com>'. Other typical formats that are accepted are "your name" and "your name" <id@bid.company.com>'. Check your SMTP documentation for acceptable values.
Recipient(s)	A blank delimited list. It is queued second. Do not use the form "name"<user@big.company.com>.

Note: A sender's name, subject, and at least one line of message text are required. Keep line lengths reasonable so that the e-mail has a readable format. The utility EXEC (QAOSMTP2) inserts a CrLf after each text line in the generated e-mail.

A QAOSMTP1 sample EXEC follows:

```

/* rexx qaosmtp1 */                                00010002
/* DOC GROUP(AO)  FUNC(SAMPLE)  AUTHOR(BMC)        */00020002
/* DOC DESC(sample EXEC for sending email via a SMTP server) */00030002
                                                    00040002
                                                    00050001
/*-----*/                                       00060001
* Sample EXEC which demonstrates sending an e-mail via a SMTP mail * 00070005
* server. * 00080005
* * 00090005
* This EXEC constructs the e-mail data then calls QAOSMTP2 which * 00100005
* reformats the data and sends it using the SMTP protocol. * 00110005
* * 00120005
* QAOSMTP2 talks to the SMTP server at port 25 using IBM REXX * 00130005
* Sockets. NOTE: QAOSMTP2 resides in BBPROC. * 00131005
* * 00140005
* Change Log * 00150005
* 9-mar-01 bpo4962 Use queue command instead of push * 00159005
* 9-feb-01 bpo4874 shipped to make bpo4874 prereq bpo4851 * 00159105
* 30-jan-01 bpo4851 update comments to note QAOSMTP2 is in BBPROC * 00159205
* 27-aug-99 bpo4319 initial release * 00160005
* * 00170005
-----*/00180001
00190001
trace n 00200001
"IMFEXEC MSG '.QAOSMTP1 EID" IMFEID "Started'" 00210001
00211005
address mvns newstack /* make a new stack */ 00212005
00220001
/*-----*/ 00230001
* * 00231005
* ----- Beginning of lines requiring changes ----- * 00232005
* * 00233005
* The external data queue is used to communicate the message text, * 00240005
* subject and sender's name to the utility EXEC (qaosmtp2). * 00250005
* * 00260005
* smtp_server is your local SMTP server. This server will distribute * 00261005
* mail to the POP3 and exchange mail servers. Many mail servers * 00262005
* will have "mail" as the first part of their network name but * 00262105
* is not required to follow this standard. * 00262205
* * 00262305
* smtp_replyto is the Email address that will receive replies when * 00262405
* responding to this Email. You should have a valid address here. * 00263005
* * 00264005
* Sender of the Email is the first line queued. It will be your * 00270005
* name which may be different from the ReplyTo e-mail id. * 00280005
* The formats allowed are dependant upon the mail server in use. * 00290005
* '<user@your-company.com>' is accepted by most mail servers. Some * 00291005
* other typical formats that are accepted 'your name' and * 00291105
* 'your name"<id@bid.company.com>'. Check your SMTP documentation * 00291205
* for acceptable values. * 00292005
* * 00293005
* Recipient(s) is a blank delimited list. It is queued second. * 00300005
* Do not use the form "name"<user@big.company.com>. * 00320005
* * 00321005
* Subject line is the third queued line. * 00330005
* * 00370005
* Email message text will be the remainder of lines queued. * 00371005
* * 00372005
* There must be a sender's name, a subject and at least one line of * 00380005
* message text. * 00390005
* * 00400005
* Keep line lengths reasonable so that your e-mails will look nice. * 00410005
* * 00420005
* The utility EXEC will insert a CrLf after each text line in the * 00430005
* generated e-mail. * 00440005
* * 00443005
-----*/ 00450005
00460005
smtp_server = 'mail.your-company.com' /* your SMTP mail server */ 00470005
smtp_replyto = 'YourName@your-company.com' /* Reply-to Email id */ 00470105
00471004
queue '<'strip(imforgn)['_AutoOPERATOR@your-company.com]>' /* sender */ 00472005
00475004
queue 'user1@xxx.com user2@yyy.com group1@zzz.com' /* recipients */ 00478005
00480001
queue 'Email subject' /* Emails subject line */ 00520005
00520104

```

Chapter 17 SNMP Solution

MAINVIEW AutoOPERATOR provides a pair of sample EXECs that can be used to generate SNMP Traps.

EXECs

The EXECs for the SNMP Solution are:

QAOSNMP1 Resides in BBSAMP.

QAOSNMP2 Resides in BBPROC.

Note: Browse the AutoOPERATOR product libraries to view the most current version of these sample EXECs. BMC Software might ship PTFs at any time to enhance them.

This SNMP sample uses REXX sockets, which are part of the IBM TCP/IP product.

QAOSNMP1

QAOSNMP1 is a sample REXX EXEC that demonstrates how to generate a SNMP Trap. The actual Trap generation logic is encapsulated in QAOSNMP2, which should be usable without modification by most customers.

To generate an SNMP Trap, copy QAOSNMP1 into UBBPROC using a new meaningful name. Replace the data in the user-input fields with the appropriate data for your installation.

You can also incorporate the logic in QAOSNMP1 into your own REXX application to generate SNMP Traps.

SNMP Traps are directed to SNMP Managers. Examples of SNMP Managers are PATROL® Enterprise Manager, Tivoli Enterprise Console, etc. You must coordinate your efforts with the administrators of your SNMP Manager. Consult them for any SNMP values of which you are unsure.

The user-input fields are as follows:

Name	Description
Community	A text string, usually used as a simple security mechanism.
SnmpManager	The IP address or host name of your SNMP Manager.
SnmpPort	The listening port number used by your SNMP Manager.
Enterprise	An object identifier that identifies the device that generates the Trap. Note: Nodes must be less than 128.
GenericTrap	An integer, specified from the SNMP-defined values for a generic Trap.
SpecificTrap	An integer, specified for a specific Trap.
TimeTicks	An integer; it usually represents the device uptime in hundredths of a second.
Object Identifier	An unique identifier for this event Trap. Note: Nodes must be less than 128.
OIDtype	The type of data; QAOSNMP2 supports Octet String (4) only.
OIDtext	Trap text.

A QAOSNMP1 sample EXEC follows:

```
/* rexx */ 00010000
/* */ 00020000
/* Sample EXEC which calls QAOSNMP2 to issue a */ 00030000
/* SNMP v1 Trap */ 00040000
/* */ 00050000
/* Nearly all parameters are passed to QAOSNMP2 */ 00060000
/* as positional parameters. QAOSNMP2 resides */ 00070001
/* in BBPROC. */ 00071001
/* */ 00080000
/* Community and OIDtext are passed on the data */ 00090000
/* stack. */ 00100000
/* */ 00110000
/* Note: Object Identifiers must begin with 1.3.x */ 00120000
/* Subsequent nodes must be less than 128 */ 00130000
/* eg. valid = 1.3.6.2.4 */ 00140000
/* invalid = 2.9.1 */ 00150000
/* invalid = 1.3.200 */ 00160000
/* */ 00170001
/* change log: */ 00180001
/* 9feb2001 bpo4874 shipped to make bpo4874 */ 00188002
/* prereq bpo4851 */ 00188102
/* 30jan2001 bpo4851 update comments to note */ 00188202
/* QAOSNMP2 is in BBPROC */ 00189001
/* 14apr2000 bpo4467 sample created */ 00190001
/* */ 00200001
/* */ 00210000
/* */ 00220000
/* this is a string ... primitive SNMP v1 security */ 00230000
Community = 'public' 00240000
/* */ 00250000
/* this can be any valid IP address or host name */ 00260000
/* eg. 132.60.1.3 or manager.bigcompany.com */ 00270000
SnmpManager = 'snmpMgr.BigCompany.com' 00280000
/* */ 00290000
/* this can be any valid port number (integer) */ 00300000
/* normally it is 162 */ 00310000
SnmpPort = 162 00320000
/* */ 00330000
/* this Object Identifier identifies the 'device' */ 00340000
/* which is generating the Trap */ 00350000
/* note: nodes must be less than 128 */ 00360000
Enterprise = '1.3.6.1.4.2' 00370000
/* */ 00380000
/* SNMP defined values for Generic Trap are */ 00390000
/* 0 = cold start */ 00400000
/* 1 = warm start */ 00410000
/* 2 = link down */ 00420000
/* 3 = link up */ 00430000
/* 4 = authentication failure */ 00440000
/* 5 = egp neighbor loss */ 00450000
/* 6 = enterprise specific */ 00460000
GenericTrap = 6 00470000
/* */ 00480000
/* specify an integer for Specific Trap */ 00490000
SpecificTrap = 0 00500000
/* */ 00510000
/* Time Ticks is an integer, it usually represents */ 00520000
/* the device uptime in hundreths of a second */ 00530000
TimeTicks = 510000 00540000
/* */ 00550000
/* Object Identifier which uniquely identifies */ 00560000
/* this event (Trap) */ 00570000
/* note: nodes must be less than 128 */ 00580000
ObjectId = '1.3.6.1.4.1.1.2' 00590000
/* */ 00600000
/* OIDtype represents the type of data, */ 00610000
/* QAOSNMP2 supports Octet String (4) only */ 00620000
OIDtype = 4 00630000
/* */ 00640000
/* This is the text of the Trap */ 00650000
OIDtext = '123 this is the text of the Alert' 00660000
/* */ 00670000
/* */ 00680000
/* Issue NewStack to insulate us from any callers */ 00690000
```

```
address mvs 'newstack'                                00700000
                                                       00710000
/* put on data stack                                  */ 00720000
push Community                                       00730000
push OIDtext                                         00740000
                                                       00750000
call QAOSNMP2 SnmpManager SnmpPort Enterprise ,      00760000
      GenericTrap SpecificTrap TimeTicks ObjectId OIDtype 00770000
                                                       00780000
/* destroy our stack                                  */ 00790000
address mvs 'delstack'                                00800000
```

Chapter 18 Using the AutoOPERATOR Web Sample

This chapter describes how to implement the AutoOPERATOR Web sample.

AutoOPERATOR Web consists of a set of samples distributed with MAINVIEW AutoOPERATOR. The code for these samples was developed for the IBM HTTP Server for OS/390 (WebSphere).

The purpose of these samples is to demonstrate AutoOPERATOR automation possibilities in Web browser environments. The samples will not be upgraded or modified in response to user requests. You can choose to personally implement new samples or modify existing samples, but these changes are at your discretion.

Introduction

The AutoOPERATOR Web solution provides sample code where REXX EXECs use AOAnywhere statements in a Common Gateway Interface (CGI) script. When the IBM HTTP Server for OS/390 (WebSphere) is in place, the sample code delivers examples of four AutoOPERATOR features viewed from a Web browser:

- Continuous State Manager (CSM)
 - AutoOPERATOR ALERTs
 - Automation Reporter
 - Commands

This chapter documents the four samples.

The samples described in this chapter are not applications. Use these samples to get ideas about how you can create your own automation from a Web browser.

The sample code also delivers MAINVIEW for DB2 examples.

What AutoOPERATOR Web Is

AutoOPERATOR Web is based on the AOAnywhere Application Program Interface. The AOAnywhere statements provide the ability to process key AutoOPERATOR functions from outside of the MAINVIEW AutoOPERATOR environment. With AOAnywhere, you can perform AutoOPERATOR automation from a batch program, an IMS MPP, a TSO CLIST, NetView, or UNIX System Services.

The function set of AOAnywhere covers basic AutoOPERATOR functions such as the variable interface, EXEC and ALERT functionality, and other automation functions. When present, SYSPLEX (XCF) connectivity provides multi-system support. AOAnywhere allows AutoOPERATOR programs (EXECs) to be run anywhere.

For more information about the AOAnywhere API and syntax, refer to the *MAINVIEW AutoOPERATOR Advanced Automation Guide*.

How AutoOPERATOR Web is Used

The AutoOPERATOR Web samples demonstrate how you can access MAINVIEW AutoOPERATOR from a Web browser. Accessing AutoOPERATOR from a browser provides you the ability to display automation data and drive automation anywhere where you can open a browser.

For example, you can implement graphical displays that illustrate the hierarchical arrangement of CSM objects or different locales interwoven in an automation Web. You can also use bar and pie charts. Graphically, these displays present a picture that is much more accessible to the operator, systems programmer, or support staff.

In addition, many forms of data representations can be much more easily implemented by using HTML, XML, Java, and so on. Even ordinary displays (such as tabular data formats) can become more usable in a browser where table sizing, scrolling, and panning are available.

What the Sample Web Pages Look Like

When installed, the samples create pages that have a similar look and feel, where each sample shows a different aspect of AutoOPERATOR as accessed with AOAnywhere statements in a CGI script. The samples create only a few pages, which are split into a number of individually scrollable panes.

All pages contain a plain white background with an AutoOPERATOR watermark. All of the pages are designed for a browser maximized at 1024x768. For most of the text, a sans serif variable pitch font is used. Detail displays use a serif variable pitch font.

Prerequisites

The section describes what you should know and how to prepare to install the AutoOPERATOR Web samples.

What You Need to Know

You should be familiar with the basic function set of AOAnywhere statements. For more information about the AOAnywhere API and syntax, refer to the *MAINVIEW AutoOPERATOR Advanced Automation Guide*.

You should have a basic understanding of IBM UNIX System Services (USS) because you will have to make changes to UNIX files. For beginners, you can use the IBM TSO ISHELL EXEC to enable you to view directories and edit USS files. This facility requires that your TSO PROC include the SBPX#### libraries; otherwise, the ISHELL EXEC does not function properly. However, someone proficient with UNIX programming can use RLOGIN and use VI to modify these files. Additionally, you might use the OMVS and OEDIT commands to configure your system. You should also be familiar with the IBM HTTP Server for OS/390.

You also need to be aware of the following considerations:

- The samples are written in standard HTML, and the underlying CGI scripts are written in REXX. You should have some understanding of these areas. Only standard HTML is used (without particular extensions), and no style sheets are used. The graphics are in GIF format. In a number of instances, the sample might contain a small amount of Java Script code.

- These HTML files and CGI scripts must be distributed in separate directories, and these directories must have entries added to the WebSphere configuration file to make them accessible to WebSphere.
- You need to review your security. USS uses the UNIX security model. Implementation of any Web application can create security exposures if the application is not properly protected. Ensure that you are familiar with your requirements. If you are implementing security for the first time, you should consult with your UNIX system administrator for security issues. Consistent user ID numbers, group ID numbers, and security policies between platforms will make USS a secure environment.
- You must ensure that OMVS segments exist for user IDs that will access the AutoOPERATOR Web samples.

Warning about Case Sensitivity

Everything in UNIX is case sensitive. Using file names, using directories, or simply modifying a file can have a serious impact if uppercase and lowercase characters are not used properly. If any problems do arise or if files are empty, ensure that you have used the correct case of every letter (for example, /usr/local/data.txt is different from /usr/local/dAta.txt).

What Information to Gather

The installation process requires that you supply the following information:

Installation directory name: The AutoOPERATOR Web samples must reside in a USS directory. The default name is:

```
/usr/local/bmc/ao62
```

where /usr/local is a standard UNIX name for local directories. Many sites do not follow this standard for installing products. You must determine the correct location for your environment. If a directory level is missing, the installation EXEC automatically creates it for you.

Group ID name: UNIX security uses group IDs. These group IDs are RACF-defined groups with an OMVS segment. The group ID that you specify is used for any new directories and all files that are created. Users in this group ID have access to the protected and non-protected applications.

Superuser authority: Superuser, also referred to as system administrator or root user, has access to write and delete all files and directories. To be defined as superuser, you must have BPX.ADMIN authority, or the UID number must be 0. If you are using BPX.ADMIN authority, you might also need to change the owner of the HTTP server configuration file.

You do not need superuser authority to install the AutoOPERATOR Web samples. Use of superuser authority simply makes the job easier. If you are not superuser, verify that the user ID used for installation can create the installation directory and create files and subdirectories in this directory. Write authority is also required for the HTTP server configuration file.

What Software Must Be Installed

IBM's HTTP Server for OS/390 (WebSphere) must be installed and operational. You must also have access to USS.

Note: You should be aware of the following information:

- These samples have been tested on IBM HTTP server and they function in this environment.
- These samples should also function for any HTTP server available on OS/390 that supports REXX as a CGI language.
- These samples should also work with IBM WebSphere Application Server, IBM Domino Go Webserver, or APACHE without any modifications. All other HTTP servers might require some minor modifications.

Installing and Customizing the Samples

This section describes the installation procedure.

Running the Installation EXEC

To run the installation EXEC, you must be logged on as a TSO user who has access to USS.

- Step 1** To start the EXEC, issue the following command from the ISPF command line:
- ```
TSO EXEC 'hilv1.BBSAMP(QAOWEBIN)'
```
- where `hilv1` is the data set prefix for the BBSAMP member.
- The first screen prompts you for a function.
- Step 2** Enter `INSTALL` to install the product (or enter `REMOVE` to remove the product from USS).
- Step 3** Enter the name of the installation directory and group ID.
- Use the information that you obtained from “What Information to Gather” on page 18-4.
- Step 4** Press **Enter**.
- Messages about the installation are displayed.
- Step 5** Review these messages and ensure that the successful installation message is displayed.

## Configuring the HTTP Server

During the installation, the name of a USS file is displayed, `http.conf.changes`. This file resides in the `secure` subdirectory of the installation directory and contains directions for applying necessary changes to the HTTP server configuration file.

The HTTP server uses a pound sign (#) in column 1 to identify comments. The directions in the `http.conf.changes` file are denoted with a pound sign in column 1 so that they are not interpreted as configuration statements.

Enter the following information as instructed in the file:

- **PASS**—Defines a directory (including subdirectories) where HTML and graphic files are located. A virtual directory name is related to this real directory. The virtual directory name must be used in the Web browser to access the files in the real directory.
- **EXEC**—Defines a directory where the CGI scripts are located. A virtual directory name is related to the real directory. The virtual directory name must be used in the Web browser to access the files in the real directory.

- **PROTECT**—Defines which virtual directory names have a security method applied. The user ID is determined through the **PROTECTION** clause. Virtual directories that are not covered by a **PROTECT** clause will use the **PUBLIC** user ID specified.
- **PROTECTION**—Defines the security method and how the user IDs are determined. Many security methods are available in **UNIX** but in this case, the **RACF** sign-on method is implemented. Your **RACF** user ID and password will be used. When a Web browser accesses any directory covered by a **PROTECT** clause that specifies this **PROTECTION** clause, the browser will be prompted for a valid **RACF** user ID and password before access is allowed.

You must restart the HTTP server after these changes have been made.

## Making BBSAMP Available to AutoOPERATOR

In addition to the CGI scripts located in **USS**, the AutoOPERATOR Web samples have **EXECs** that execute in the AutoOPERATOR address space. These **EXECs** must be made available by ensuring that the **BBSAMP** data set is in the **SYSPROC** concatenation of the AutoOPERATOR **PROC**.

## Meeting AOAnywhere Requirements

AOAnywhere syntax is used throughout the CGI scripts. For this process to occur, **BBLINK** must be available to the CGI scripts. The CGI scripts run under **USS** and therefore, it might be easier to add **BBLINK** to **LNKLST** rather than trying to define a **STEPLIB** to a **USS** task.

When **BBLINK** is added to **LNKLST**, there might be a requirement to authorize **BBLINK** by using **APF**, depending on the BMC Software products in use. For details, see “Performing Automation Using AOAnywhere” in the *MAINVIEW AutoOPERATOR Advanced Automation Guide*.

## Reviewing Security

BMC Software recommends that your **UNIX** system administrator review the security that has been implemented. The administrator will be familiar with areas that might cause problems or areas that might be more vulnerable.

Subdirectory `secure` (and all of its subdirectories) in your installation directory are covered by one PROTECT clause that you added. A valid user ID and password must be entered before access is allowed to these secured applications. Subdirectory `secure` defaults to allowing access to users in the group ID specified during installation. If a user has access to `secure`, that user has access to all files and subdirectories in this directory. If `secure` existed prior to running the installation EXEC or was modified after installation, access to the files might be different than documented here.

All other files and subdirectories that are not in the `secure` subdirectory have been made public. These applications are display only.

You can limit public access to display-only applications by increasing the scope of the PROTECT clause in the HTTP server configuration. See “Configuring the HTTP Server” on page 18-6.

You might also consider limiting user access to directories by changing directory access modes. Because the installation process does not change directory access modes if they exist prior to installation, changes to directories are retained when updates are applied. Files on the other hand are replaced. Their file modes are lost. All changes to files will need to be re-applied when installing new versions.

For the best security results, consult with your UNIX system administrator.

## Accessing Multiple Systems

The samples were written with the AOAnywhere XCF capability to access AutoOPERATOR subsystems across the SYSPLEX. To implement this feature, at least one AutoOPERATOR 6.1 (or later) must be running on the same system as the HTTP server. If you have systems in different SYSPLEXs, multiple HTTP servers that will run these samples, or a configuration where the samples must run under different HTTP servers, you need to install the samples on each affected system. Most installations of USS do not share Hierarchical File System (HFS) directories. If this is your case, you need to install on each system where the AutoOPERATOR Web samples run under a HTTP server.

## Accessing the Samples

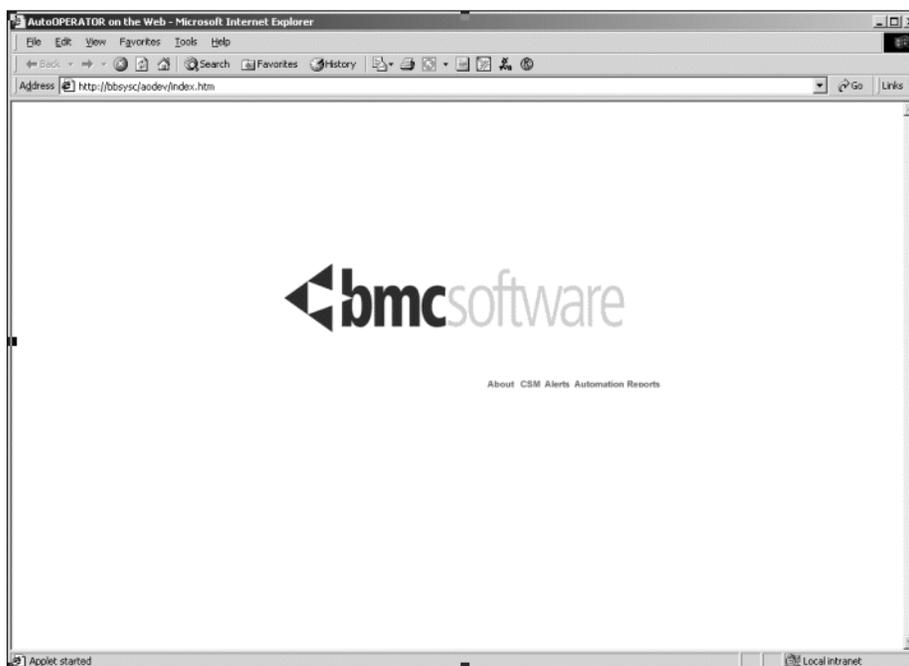
To access the samples, start a Web browser on your PC or UNIX system. Change the address in the Web browser to the DNS-defined name of your OS/390 TCP/IP address that is running the HTTP server, followed by /ao. If you do not know the DNS-defined name, substitute the TCP/IP address for that system (for example, `bmcsysa/ao` or `192.0.0.1/ao`). If you did not change the HTTP server WELCOME statement, `index.html` will be automatically displayed. If `index.html` was removed, add `/index.html` to the address in the browser.

## Viewing the Entry Page

The entry page consists of a BMC Software logo and hyperlinks (see Figure 18-1).

Below the logo is a small navigation bar with hyperlinks. The hyperlink text changes colors when the cursor passes over it. These same hyperlinks are present on all pages. By clicking one of these hyperlinks, you can access the other pages.

Figure 18-1 AutoOPERATOR Web: Entry Page

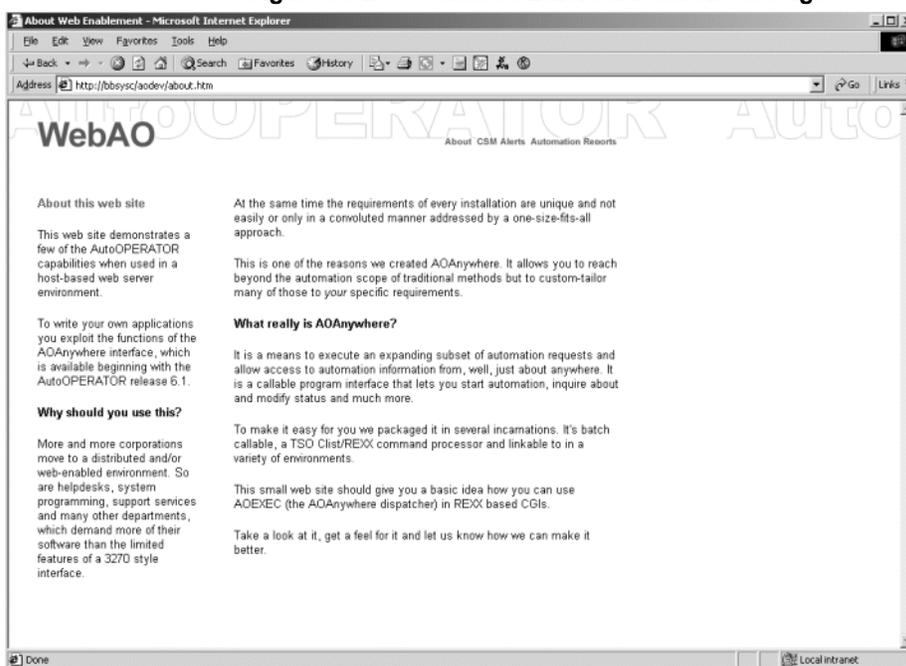


## Viewing the About Page

The About page shows the WebAO heading at the top of the page, which is common to all pages except the entry page. Using the navigation bar on the right side, you can link to all other pages on the site. The WebAO heading in the upper left is also a active hyperlink that changes color as the cursor passes over it. You can click on this heading to access the entry page.

The About page (see Figure 18-2) introduces the fundamentals of the site and AOAnywhere.

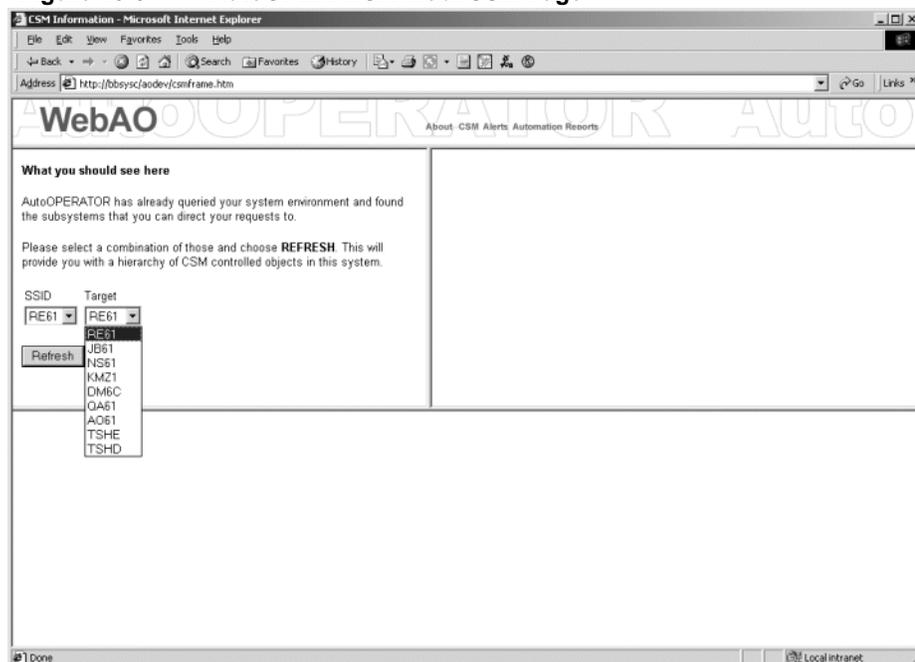
**Figure 18-2 AutoOPERATOR Web: About Page**



## Viewing the CSM Page

This sample requires that CSM be active on the targeted system. The CSM page, like all other WebAO informational screens, is split into four distinct panes (see Figure 18-3).

**Figure 18-3 AutoOPERATOR Web: CSM Page**

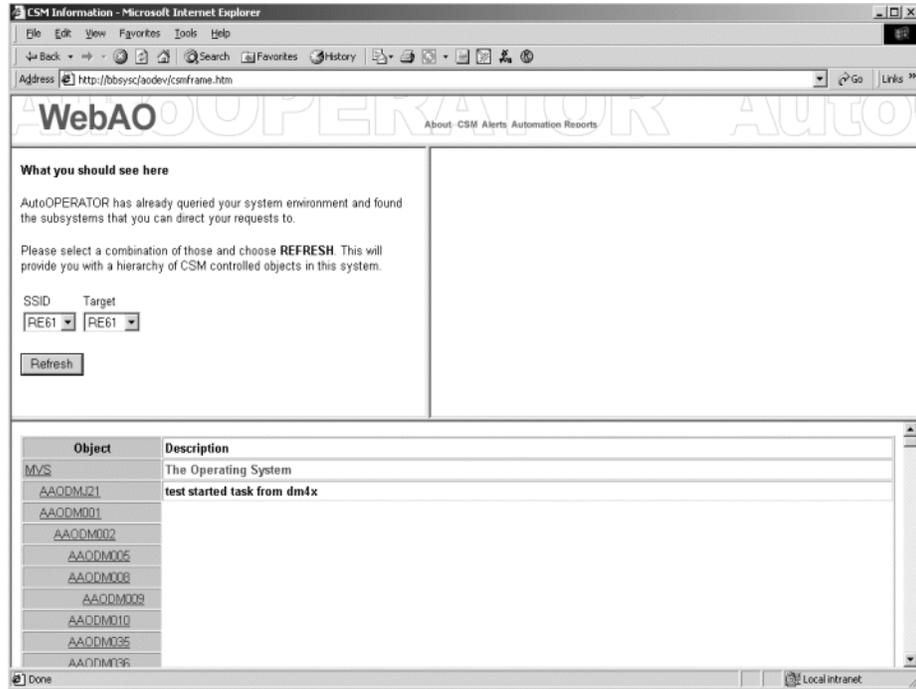


The top pane features the usual navigation and identification format. The middle left pane displays information, instructions, and two drop-down boxes. The drop-down box on the left side displays all AutoOPERATOR subsystems (except BBI-3 subsystems) on the current MVS image. Using the drop-down box on the right side, you can access any connected AutoOPERATOR system, whether it is on the current image or a remote image. When the request is directed against only one subsystem (without routing), both boxes should contain the same name.

You can use the Refresh button to retrieve (and refresh) data. No data is shown in Figure 18-3 because a target has not been chosen.

The initial set of data is overview material and is displayed in the bottom frame when a search is conducted, as shown in Figure 18-4.

**Figure 18-4 AutoOPERATOR Web: CSM Page with Objects**



In Figure 18-4, the bottom pane shows CSM objects arranged hierarchically, where the indented position denotes the parent-child relationships. The pane is scrollable. The right portion of the pane shows the descriptions that are associated with each object. The descriptions are color-coded according to their hierarchy level.

The objects themselves can be hyperlinks and are DHTML animated (where they change color as the cursor passes over them). As hyperlinks, they are not color-coded according to their hierarchy level, but they change colors according to whether they have been viewed. If you click on one of the objects, detailed data is displayed in the middle right pane (see Figure 18-5).

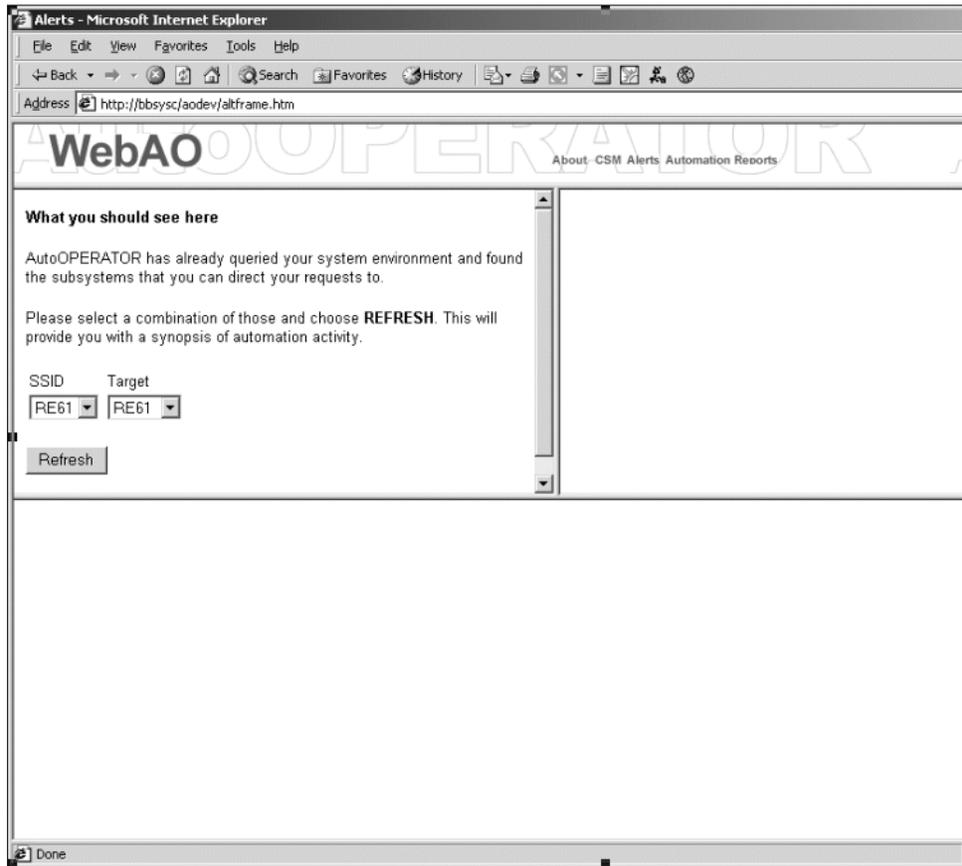
**Figure 18-5 AutoOPERATOR Web: CSM Object Description**



## Viewing the ALERTs Page

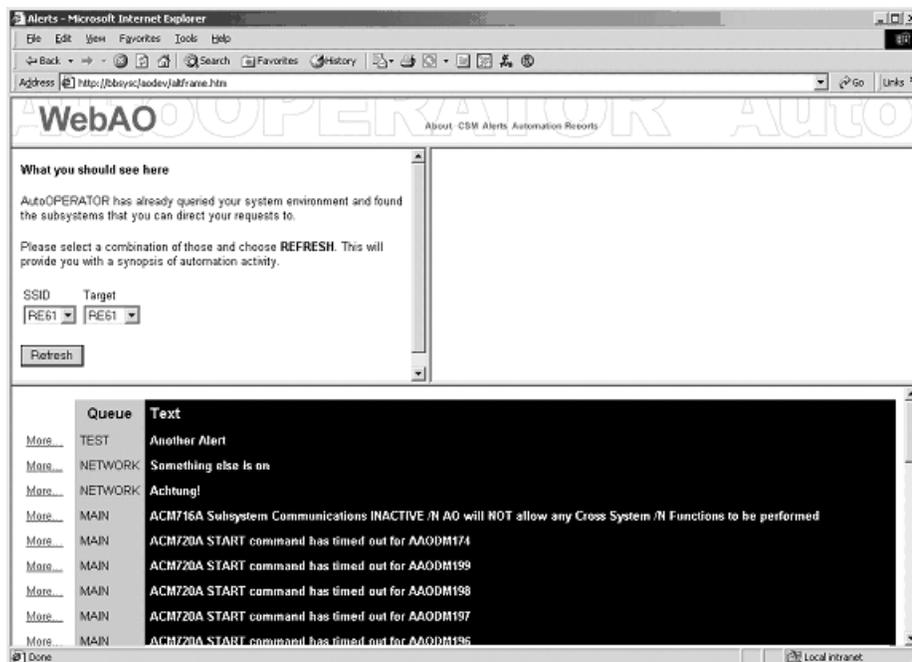
The initial ALERTs page is identical to the CSM page and Automation Reporter page, except for the name (“ALERTs”) in the title bar of the browser window (see Figure 18-6).

Figure 18-6 AutoOPERATOR Web: ALERTs Page



A Refresh button activates the actual retrieval (and refresh) of data. The data appears in the bottom pane (see Figure 18-7).

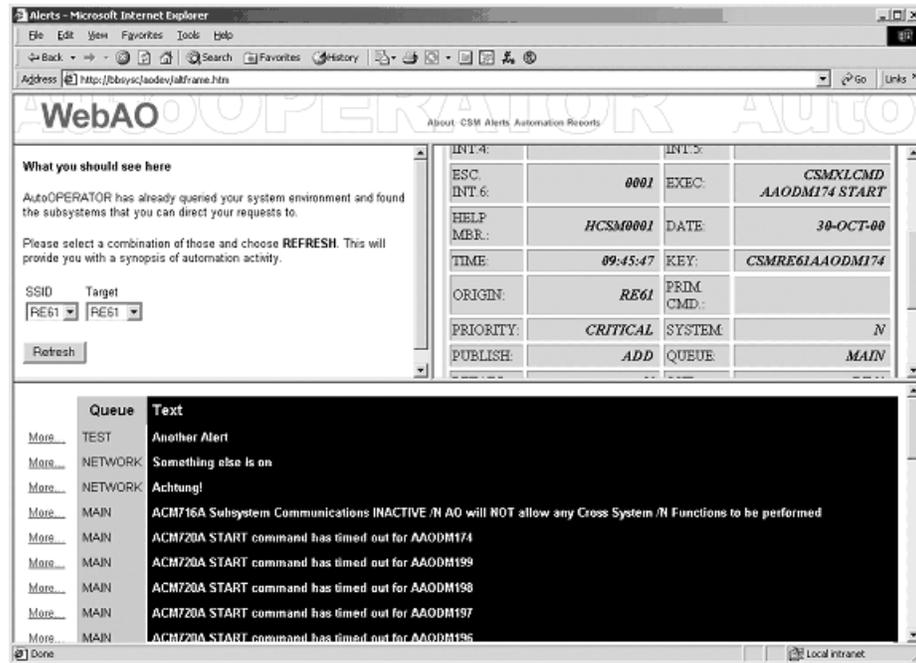
**Figure 18-7 AutoOPERATOR Web: ALERTs Page with Data**



The first column of the bottom pane consists of [More...](#) hyperlinks that link to further information. The **Queue** column shows the name of the ALERT queue.

The third column uses a black background for better visibility of the ALERT colors, which denote priority and severity. Clicking the [More...](#) hyperlink displays a scrollable middle right pane where all data that is associated with this particular ALERT is displayed.

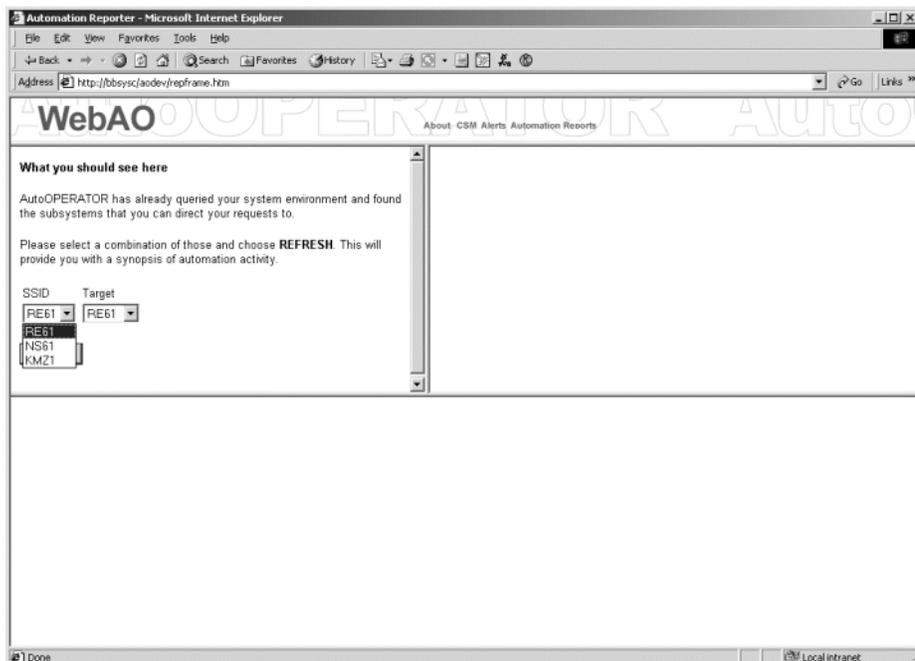
**Figure 18-8 AutoOPERATOR Web: Scrolling ALERTS**



## Viewing the Automation Reporter Page

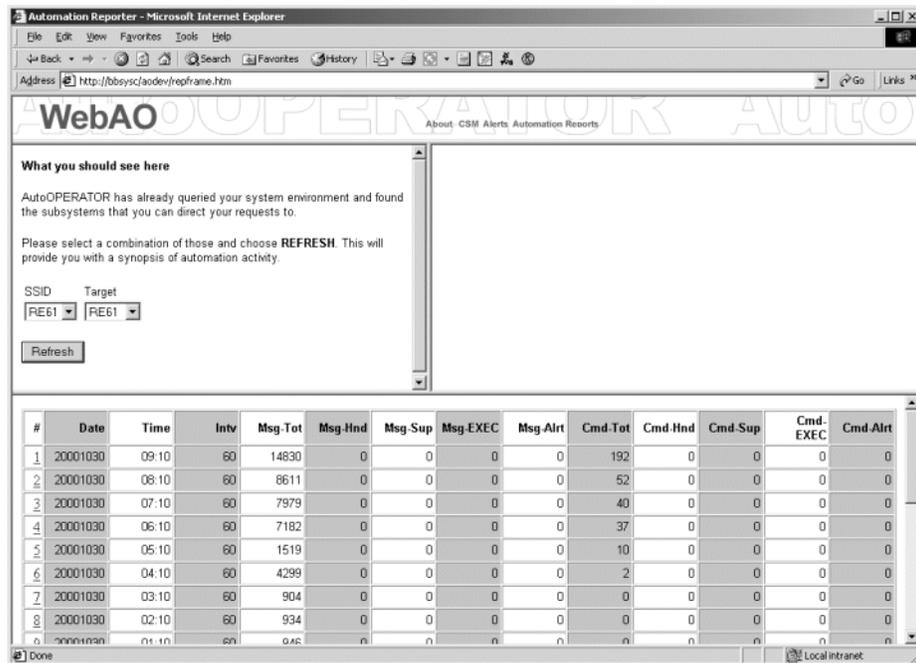
This sample requires Automation Reporter to be active on the targeted system. The initial Automation Reporter page is identical to the CSM page and ALERTs page, except for the name (“Automation”) in the title bar of the browser window (see Figure 18-9).

**Figure 18-9** AutoOPERATOR Web: Automation Reporter Page



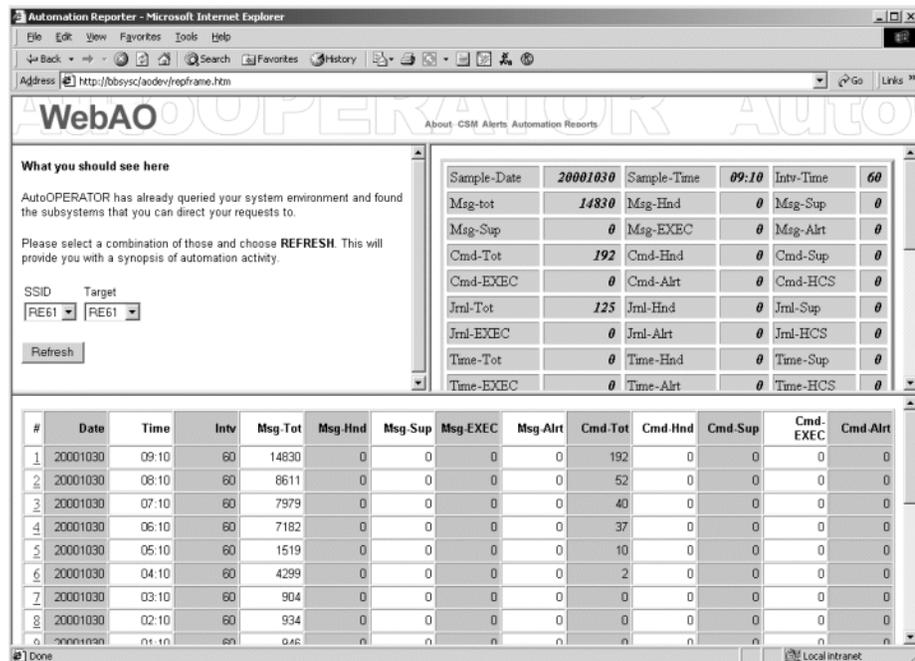
When you specify subsystems and targets from the drop-down boxes, automation statistics are displayed, sorted from most recent statistics oldest statistics, as shown in Figure 18-10. This data is directly read from the Automation Reporter data gatherer.

**Figure 18-10 AutoOPERATOR Web: Automation Reporter Data Displayed**



If you click an interval in the first column, the full set of statistics is displayed in a scrollable middle left pane, as shown in Figure 18-11:

**Figure 18-11 AutoOPERATOR Web: Automation Reporter Statistics Displayed**



## Viewing the Commands Page

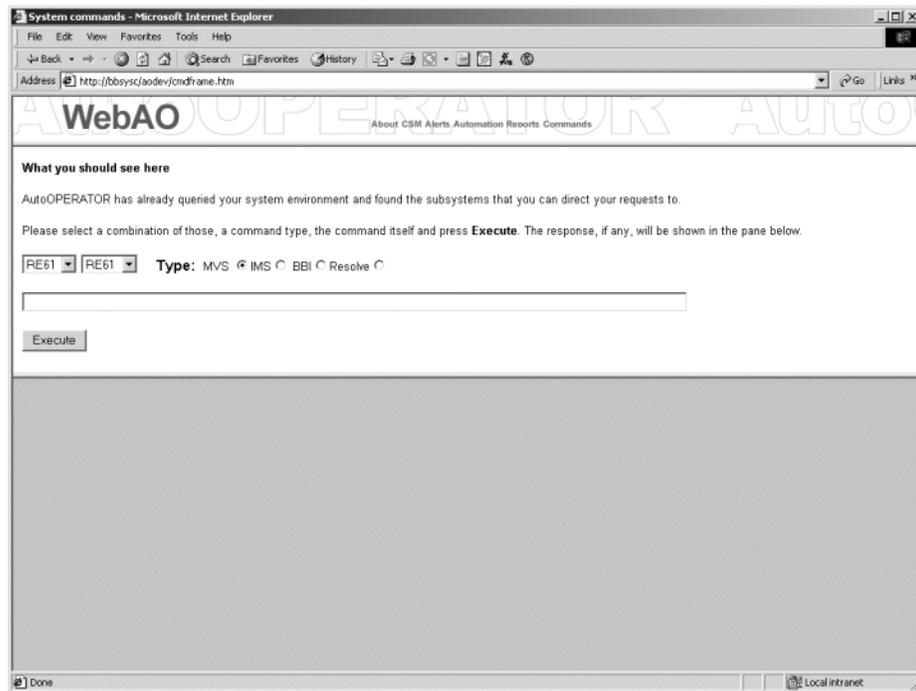
The initial Commands page is divided into three panes:

- WebAO heading and hyperlinks in the top pane
  - various input fields in the middle pane
  - an output pane at the bottom

The output pane is intentionally silver. In the middle pane, you can use the drop-down boxes to select local and target subsystems, and you can specify the type of command to be issued (prefix characters such as # and . are acceptable). Currently, MVS, IMS, BBI, and Resolve commands may be selected.

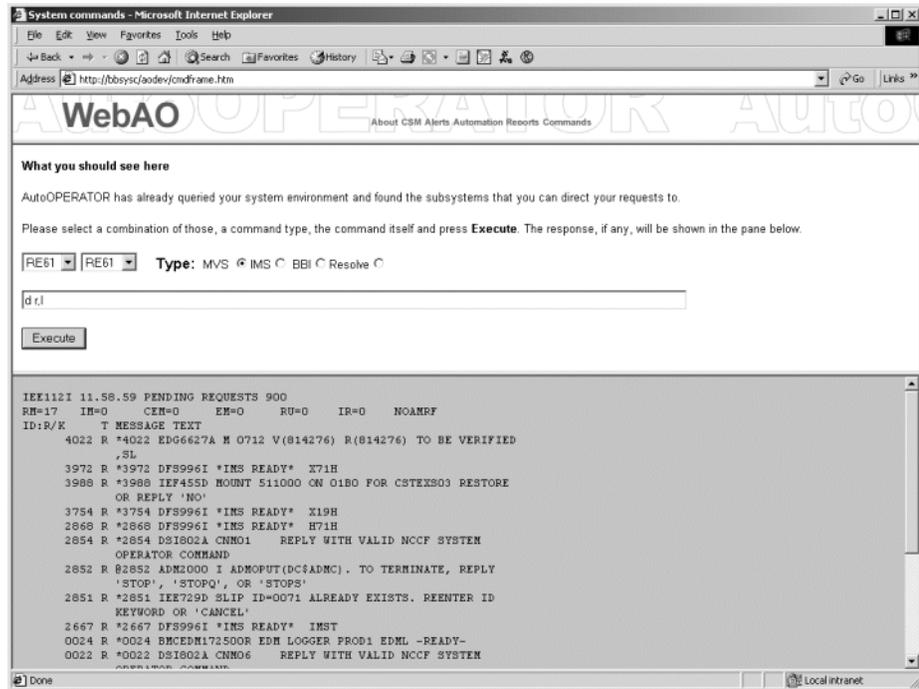
The text box (below the drop-down boxes) is designated as the input area for the command itself, and the Execute button submits the command.

**Figure 18-12 AutoOPERATOR Web: Commands Page**



When you make selections, output is displayed at the bottom (see Figure 18-13):

**Figure 18-13 AutoOPERATOR Web: Command Output Displayed**



The output is scrollable.

## Debugging the Distributed CGI Scripts

All of the CGI scripts were created to be as independent of their environment as possible. With the exception of parameter parsing, these EXECs will run successfully in any environment.

The following sections contain tips for understanding and debugging the sample CGI scripts.

## Understanding CGIs

The AutoOPERATOR Web samples consist of HTML tagging and CGI scripts. The CGI scripts are created as REXX EXECs. These EXECs obtain their input from the stack and then parse the information according to CGI requirements. All other statements in the AutoOPERATOR Web samples are compatible with any available REXX environment.

A CGI runs in the same way as a normal REXX EXEC except that all SYSTSPRT output is directed to the Web browser (either Netscape or Microsoft<sup>®</sup> Internet Explorer). The 'SAY "Content-type: text/html"' statement is required because it tells the browser what to do with the SYSTSPRT data. In the sample code, it is coded to tell the browser to expect HTML from SYSTSPRT.

## Debugging the CGI Script in a TSO Environment

All sample CGIs can be copied to a CLIST library and run as TSO CLISTs. The only modification required is parsing the parameters and getting the test parameters into the EXEC. To do this, disable the parse routine and manually set the required variables. The output that would be directed to the browser now appears on your TSO session. Be aware that HTML formatted data will appear on your screen, enclosed in < > characters.

## Debugging the CGI Script without HTML Decoding

You can use the REXX TRACE command when running a CGI script. If TRACE is specified, only SYSTSPRT data occurring after the SAY "Content-type: text/html" statement appears in the browser window. One problem with this process is that trace data will be displayed as a continuous stream of data. To avoid this problem, turn off HTML decoding by changing the content type to "Content-type: text/plain".

## Avoiding Frames in the Display

Parts of the sample code contain HTML frames. Frames split the browser screen into windows. If the screen is split into frames, you can determine the frame definitions by changing the address specified in the address field of the browser. Each frame has HTML or CGI coding that has been executed. Determine which HTML or CGI code was executed for that frame and use that code in the browser's address field. This process separates the executable data into separate browser screens to make problem diagnosis a little simpler.

## Displaying the HTML Source in a Frame

You can choose to display only the HTML source for a frame definition. To display the source for a frame, right-click anywhere in the frame and choose Source or choose Source from the View menu.

## Refreshing HTML Source Code

HTML source code is stored in the browser's cache. To refresh changes that are made to the HTML source code:

- For Internet Explorer, hold down the Ctrl key and click on the browser's Refresh button.
- For Netscape, hold down the Shift key and click **Refresh**.

CGI output is forced to refresh by using the PRAGMA directive with NO-CACHE into its output.

## Common Error Messages

This section contains common error messages that you might encounter and describes what they mean.

**Table 18-1 Common Error Messages (Part 1 of 2)**

| Message                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Can't locate HTTP configuration file.               | The configuration file is listed in the JCL startup proc for your HTTP server, after the -r option. If you are using the free IBM HTTP server and if you have only one copy, the name of the configuration file will be /etc/http.conf.<br>If a period precedes the file name (/etc/http.conf), you need to check the LEARM variable in the proc for the specification of _CEE_ENVFILE. The file specified here contains a home directory name. The file will be located relative to this home directory name if the configuration file name was specified beginning with a period. |
| "*-* address linkmvs "AOEXEC P1" +++<br>RC(-3) +++" | If this message is displayed in a frame, it means that AOAnywhere is not available in linklist or in the USS steplib variable.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Web browser 403 - 403                               | A security problem has occurred. You should review each directory level of your installation directory. Ensure that READ and EXECUTE are on of the GROUP and OTHER modes of each subdirectory.                                                                                                                                                                                                                                                                                                                                                                                      |

**Table 18-1 Common Error Messages (continued) (Part 2 of 2)**

| <b>Message</b>                                                    | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Web browser 404 - 404                                             | This message indicates an "address cannot be found" condition. If this message occurs with the first screen, you need to verify that the PASS statement that you added is not preceded by the PASS /* in your HTTP configuration file. The address search starts from the top of the configuration file and stops when the first PASS or EXEC address is true for this address (for example, if /* precedes /ao/*, execution would stop at /* because it matches all address). |
| Frame is missing the available system list and the REFRESH button | The server side includes are not working in the HTTP server. Ensure that your HTTP configuration file specifies at least "imbeds on SSIOnly" and the ADDTYPE for ".shmtl", and ensure that text/x-ssi-html is specified.                                                                                                                                                                                                                                                       |

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# Chapter 19 Using the Paging Sample

MAINVIEW AutoOPERATOR provides sample code that enables you to communicate with wireless devices, including both text and numeric pagers, which could be one- or two-way devices. You can also obtain confirmations and responses if the destination device and its provider offer these capabilities.

This sample was developed by using the Simple Network Paging Protocol (SNPP rfc 1861) as implemented by SkyTel Communications, Inc.

## EXECs

The EXECs for the Paging sample are:

**QAOSNPP1** Contains the calling communication logic.

**QAOSNPP2** Contains the communication logic.

The EXECs are not compiled, so you can modify them for your application.

## QAOSNPP1

The QAOSNPP1 EXEC is the calling sample and does not have input parameters.

## QAOSNPP2

The QAOSNPP2 EXEC can have from 0 to 9 parameters, depending on the mode. Each parameter (except the message text) has the following format:

---

PARAMETER\_NAME ( VALUE )

---

Parameters are separated by blanks and can be in any order. The parameters are described in the following table.

| Parameter | Description                                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HELP      | Optional. Default is HELP(NO).<br>If HELP(YES) is specified, if the program is called without parameters, or if HELP is specified with no parameters, the calling format is printed to the BBI Journal. |
| MODE      | Optional. Default is MODE(SEND).<br>MODE can have one of the following values: <ul style="list-style-type: none"><li>• SEND - Send the message.</li><li>• STATUS - Check the message status.</li></ul>  |

### Parameters for MODE(SEND)

If you specify MODE(SEND), additional parameters are available that you can set. These parameters are described in the following table.

**Table 19-1 Parameters for MODE(SEND (Part 1 of 2)**

| Parameter | Description                                                                                                                                                                                                                                                                                     |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SERVER    | Required.<br>Specify the Internet name or address of the message server provider. For example, for SkyTel, the Internet name is snpp.skytel.com.                                                                                                                                                |
| PORT      | Required.<br>Specify the message server provider port to which the program should connect. In the sample, the port is set to the value 7777.                                                                                                                                                    |
| PIN       | Required.<br>Specify the service provider access PIN or a direct telephone number.                                                                                                                                                                                                              |
| USER      | Optional.<br>Specify the name of the user to whom you are sending a message. This value is used in the messages and ALERTs issued by the program.<br>Default is NONE.                                                                                                                           |
| TIMEOUT   | Optional.<br>Specify the time (in seconds) that the program can wait for the TCP/IP response before timing out.<br>Default is 10 seconds.                                                                                                                                                       |
| CONF      | Optional.<br>You can specify CONF(YES) if you want to receive a confirmation of a successful message delivery. CONF(YES) can be used only with two-way pagers or telephones with a messaging service.<br>Default is CONF(NO).<br>CONF(NO) can be specified when calling any pager or telephone. |

**Table 19-1 Parameters for MODE(SEND (Part 2 of 2)**

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                   | Description                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| DEBUG                                                                                                                                                                                                                                                                                                                                                                                                                       | Optional.<br>Specify DEBUG(YES) to print the contents of all TCP/IP exchanges (and some other debugging information) to the BBI Journal. |
| <b>Note:</b> Message text should be written after key parameters.<br>If the message text must contain an open parentheses symbol, (, separate it with <<.<br>When QAOSNPP2 is called from an IMFEXEC SELECT statement, the total statement length is restricted to 256 characters (including information content). If QAOSNPP2 is called from another EXEC with a CALL statement, the length can be up to 2,500 characters. |                                                                                                                                          |

### Parameters for MODE(STATUS)

Use MODE(STATUS) only when an ALERT is created when a message is sent. MODE(STATUS) has one parameter, which is the variable name containing the list of values for status requests.

## Processing Flow

The calling EXEC, QAOSNPP1, has four components:

- A tuning section where you can change parameters for your needs
- A checking section to verify the information
- The CALL statement
- A section for result messages processing

QAOSNPP2 contains the main logic and performs the following tasks:

- It extracts and checks parameters.
- It prints the calling format and exit if help is requested.
- It connects to the server/port and performs the TCP/IP message exchange with a server.

- 
- In the CONF(YES) mode, it creates an AutoOPERATOR ALERT that escalates within a minute and calls a follow-up EXEC in STATUS mode. It creates a unique variable name formatted PAGING.xxxxxxxx (where xxxxxxxx are the last eight numbers of the current time) and puts all necessary information into a long profile variable with this name. The variable name becomes the second parameter of QAOSNPP2.

**Note:** In the CONF(NO) mode, no more actions required

- When QAOSNPP2 is called in STATUS mode, it sends a status request to the server and replaces the original ALERT with the ALERT escalating up (if the message is still not delivered). Otherwise, it sends a status request to the server and replaces the original ALERT with a clearing ALERT escalating down.

## Variables Returned from QAOSNPP2

If the QAOSNPP2 EXEC is invoked from IMFEXEC SELECT, the following variables are returned:

- IMFCC, which contains the return code from the IMFEXEC SELECT statement.
- IMFRC, which contains the condition code returned on the IMFEXEC EXIT statement of QAOSNPP2 when IMFEXEC SELECT WAIT(YES) is specified.
- LOCAL variables APFCC and APFRC, which contain condition and return codes.
- LOCAL variables APFLN1 through APFLNn, which contain additional information.
- LOCAL variable APFNOL, which contains the number of APFLN1-Nn variables.

The following table contains the error messages and the IMFRC, APFRC and APFCC values that are found in LOCAL variables APFLN1 through APFLNn.

| Error Message in APFLNn                                                                                                                      | IMFRC | APFCC | APFRC                    |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--------------------------|
| PF0000I SUCCESS                                                                                                                              | 0     | 0     | 0                        |
| PF2001E Message timed out.                                                                                                                   | 8     | 4     | 1                        |
| PF2002E <Message from the service provider>                                                                                                  | 8     | 4     | 2                        |
| PF2002E Transmission ID Error                                                                                                                | 8     | 4     | 2                        |
| PF2003E PIN is not recognized by service provider.                                                                                           | 8     | 4     | 3                        |
| PF3001E QAOPAGE1: SOCKET(SOCKET)<br>PF3001E QAOPAGE1: SOCKET(CONNECT)<br>PF3001E QAOPAGE1: SOCKET(WRITE)<br>PF3001E QAOPAGE1: SOCKET(SELECT) | 8     | 8     | TCP/IP<br>return<br>code |
| PF4001E QAOPAGE1: User ID is unknown.                                                                                                        | 8     | 12    | 1                        |
| PF4002E QAOPAGE1: Page service provider is unknown.                                                                                          | 8     | 12    | 2                        |
| PF4003E QAOPAGE1: Unable to initialize SOCKET                                                                                                | 8     | 12    | 3                        |
| PF5051E QAOPAGE1: Error found in MODE parameter                                                                                              | 8     | 16    | 51                       |
| PF5052E QAOPAGE1: Error, SERVER or PORT parameter is not providedk.                                                                          | 8     | 16    | 52                       |
| PF5053E QAOPAGE1: Error in CONF parameter (YES/NO).                                                                                          | 8     | 16    | 53                       |
| PF5054E QAOPAGE1: Message text is not provided.                                                                                              | 8     | 16    | 54                       |
| PF5055E QAOPAGE1: PIN number is not provided or not numeric.                                                                                 | 8     | 16    | 55                       |
| PF5056E QAOPAGE1: Error in TIMEOUT parameter, it is not numeric.                                                                             | 8     | 16    | 56                       |
| PF5057E QAOPAGE1: Error in DEBUG parameter (YES/NO)                                                                                          | 8     | 16    | 57                       |
| PF5061E QAOPAGE1: Error in parameter structure                                                                                               | 8     | 16    | 61                       |
| PF5062E QAOPAGE1: Unknown parameter                                                                                                          | 8     | 16    | 62                       |
| PF5063E QAOPAGE1: Error during VGETL                                                                                                         | 8     | 16    | 63                       |

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# Appendix A Sample EXECs

This appendix introduces two EXECs (@TIMER and JESDOWN).

## @TIMER

For more information about the @TIMER EXEC, refer to the chapter on “Using the AutoOPERATOR-Supplied Utility EXECs” in the book *MAINVIEW AutoOPERATOR Advanced Automation Guide*.

## JESDOWN

The JESDOWN EXEC is located in BBPROC. It is invoked by the operator to shutdown JES2. When invoked, a WTOR message is displayed. The operator must respond with Y to continue with the shutdown or N to cancel processing. If Y is entered, the following steps are taken:

1. A \$PI command is issued to drain all of the initiators.
2. A \$P command is issued to stop all new JES requests and reset current activities.
3. Commands are issued to display and then to stop all remotes.
4. Command are issued to display and then to stop all lines.
5. Commands are issued to display and then to stop all active batch jobs.
6. Commands are issued to display and then to stop all active printers.

7. A IMFEXEC WAIT command is issued.
8. A WRITELOG command is issued.
9. A \$PJES2 command is issued next.
10. If the operator gets a response that the system is not dormant, a WTOR message is displayed giving the operator the option to force a shutdown.
11. If the operator replies with an Y to force the shutdown, a \$PJES2, ABEND command is issued.
12. If JES2 ends successfully, a WTO message “JES2 shutdown completed successfully” is displayed. If JES2 does not end, a WTO message “JES2 is still draining, please initiate manual procedures” is displayed.

The JESWAIT Profile variable can be customized. It is located in the MSU002C EXEC.

---

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## Appendix B Sample REXX EXECs

REXX has many built-in functions, data queues, and stacks that make it a powerful interpretive language. The BMC Software sample REXX EXECs use some of the features of the REXX Language. The REXX samples, which have been distributed, demonstrate these features. For a complete discussion of the constructs and the syntax of the REXX language, refer to the IBM manuals for the version of REXX installed in your environment.

The following sample EXECs are the basis for the comparison and discussion of the REXX procedural language. Although further customization and changes are *required* to fully utilize these EXECs in a production environment, they are intended to illustrate some of the features of the REXX language.

These sample EXECs for REXX are distributed in the BBPROC data set. BMC Software provides the following REXX Sample EXECs.

### **REXX Compound Variable Initialization**

Set values for variables using the REXX STEMS

### **REXX DASD Reserve Analysis**

Provides immediate insight into contention problems in a shared DASD environment

### **REXX QUEUE/PULL And VPUT/VGET Usage**

Use VPUT/VGET and QUEUE/PULL instructions to store and retrieve data

## REXX Compound Variable Initialization EXECs

Two sample EXECs, MSU006X and MSU006X2, are distributed to show initialization of REXX compound variables.

In CLISTs, compound variables are defined with ampersands (&) and the REXX equivalent of ampersands is the STEM variable. The REXX compound variables are defined with STEM where the STEM variable is of the form VAR.n and n is an integer.

The following instructions reference values for SYS1 and SYS2 within a CLIST:

---

```
IMFEXEC VGET (SYSN) PROFILE
SET &N = 1 /* INITIALIZE THE INDEX VALUE */
DO WHILE &N LE &SYSN /* SET UP THE LOOP */
IMFEXEC VGET (SYS&N) PROFILE
SET &SS = &&SYS&N /* DERIVE THE VALUE */
```

---

The following set of instructions refer to the same values in a REXX EXEC:

---

```
ADDRESS IMFEXEC /* SET IMFEXEC AS THE EXTERNAL ENVIRON */
IMFEXEC VGET (SYSN) PROFILE
DO N=1 TO SYSN BY 1 UNTIL N>SYSN
IMFEXEC VGET ('SYS'N) PROFILE
SS = VALUE('SYS'N) /* DERIVE THE VALUE */
```

---

Notice that with CLISTs, the value of a compound variable must be derived using the && expression, whereas REXX uses the built-in function VALUE.

The apostrophes around SYS define it as a literal to REXX and distinguish the literal from the variable N. If a STEM variable was defined at initialization, this example could have used the following instruction to get the values for SYS.N:

```
IMFEXEC VGET (SYS.N) PROFILE
```

With this instruction, there are no apostrophes to distinguish SYS as a literal because 'SYS.' is a STEM and REXX defaults it to a literal.

In Figure B-1 on page B-3, note that there is no SET command in REXX. Any expression with an equal sign (=) implies an ASSIGNMENT command that functions the same as a CLIST SET command. MSU006X initializes the SYSN variables for reference by both CLIST and REXX EXECs. MSU006X is a REXX EXEC because the STEM variable, SYS.1, is not a valid expression within a CLIST.

MSU006X illustrates the assignment of values to both `SYS1` and `SYS.1` variables but you must code the values within the EXEC. `MSU006X2` illustrates the assignment of values to the `STEM` variables `SYS.n` by deriving the values of `SYS&n` within the context of MAINVIEW AutoOPERATOR initialization.

**Figure B-1 REXX EXEC - MSU006X**

---

```

/*-----*/
SYS1="NONE" /* TARGET SYSTEM(NAME#1) FOR CLIST REFS */
SYS2="NONE" /* TARGET SYSTEM(NAME#2) FOR CLIST REFS */

SYS.1="NONE" /* TARGET SYSTEM(NAME#1) FOR REXX REFS */
SYS.2="NONE" /* TARGET SYSTEM(NAME#2) FOR REXX REFS */
/*-----*/

```

---

At MAINVIEW AutoOPERATOR initialization, the values for `SYS&n` were specified to match the number of target systems within your environment. To build the REXX `STEM` variables, you can either change the whole start up EXEC, `MSU002C` or use `MSU006X2`, which dynamically assigns the values.

#### EXECs for REXX Compound Variable Initialization

|                 |                                                                                                                                             |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MSU006X</b>  | Assigns values for <code>SYS1</code> , <code>SYS2</code> , <code>SYS.1</code> and <code>SYS.2</code> statically                             |
| <b>MSU006X2</b> | Assigns values for <code>SYS.1</code> and <code>SYS.2</code> dynamically by deriving the values for <code>SYS1</code> and <code>SYS2</code> |

## REXX DASD Reserve Analysis EXEC

The sample REXX DASD Reserve Analysis EXEC is modeled after the CLIST version of the same EXEC. This discussion concentrates on the use of REXX functions and instructions. For the complete discussion of this EXEC, see “DASD Reserve Analysis Solution” on page 9-4.

For the EXEC to function properly in your environment, you should establish values for the following variables.

| Variable         | Description                                                              |
|------------------|--------------------------------------------------------------------------|
| <b>SYSN</b>      | Number of MVS systems in the shared DASD configuration                   |
| <b>SYS1-SYSn</b> | Names (for example, SMFID) of each system in a shared DASD configuration |

This EXEC is initiated by a Rule for the following IOS message:

```
IOS071I ucb, chpid, jobname, start pending.
```

When REXX EXECs are started based on a `TEXT ID`, `MAINVIEW AutoOPERATOR` does not parse the message text prior to scheduling the specified EXEC. The REXX EXEC must do the parsing using the REXX instruction, `PARSE`.

The following instruction parses the `IOS071I` message in the distributed EXEC, `IOS071IX`.

```
PARSE ARG IOS071IX P1 ',' P2 ',' P3 ',' P4 P5 .
```

The `PARSE` instruction has other keyword operands besides `ARG`.

You should consult the *TSO Extensions Version 2 Reference* for a full discussion of the `PARSE` instruction. In this EXEC, the `ARG` keyword indicates that parsing should be done on the passed parameter strings.

The parameter string contains commas and blanks; in REXX EXECs, the EXEC must specify the parsing pattern. This example has commas in the pattern to subdivide the message. The following values would be placed in the variables:

| Variable        | Value   |
|-----------------|---------|
| <b>IOS071IX</b> | IOS071I |
| <b>P1</b>       | ucb     |
| <b>P2</b>       | chpid   |
| <b>P3</b>       | jobname |
| <b>P4</b>       | start   |
| <b>P5</b>       | pending |

Because this discussion does not go beyond the `P5` variable, the EXEC has a period (`.`) as the last variable.

`IOS071IX` uses the `ADDRESS` command to inform REXX that non-REXX language instructions should be passed on to the external environment. After a `VGET` is completed to derive the value for `SYSN` (the number of shared systems), `IOS071IX` goes into the following loop:

---

```

DO N=1 TO SYSN BY 1 UNTIL N>SYSN /* LOOK AT ALL SYSTEMS */
 IMFEXEC VGET ('SYS'N) PROFILE /* START GETTING SS IDS*/
 TARG = VALUE('SYS'N) /* SET TARGET SYS NAME */
 IF TARG \= IMFORGSS THEN DO /* DON'T PROCESS THIS */
 ADDRESS IMFEXEC
 IMFEXEC SELECT, /* COMMAS ARE USED FOR */
 /* CONTINUATION IN REXX*/
 "EXEC(MPE001X" IMFORGSS P1 P3 ") TARGET("TARG")"
 END
END
END

```

---

Since REXX does not permit the use of ampersands, this example has apostrophes to distinguish a literal from a variable when the VGET was issued for the SS IDs. Remember that SYSN is the total number of subsystems in a shared DASD complex and 'SYS'N is the subsystem ID. The built-in function VALUE is used to assign TARG; if this value function was not used, the following IF clause would fail every time:

```
IF 'SYS'N = IMFORGSS THEN DO
```

The next instruction could have been used successfully in the IF construction:

```
IF IMFORGSS = VALUE('SYS'N) THEN DO
```

Because follow-up EXEC MPE001X needs to be scheduled on the TARGET system, it is easier to use the ASSIGNMENT clause to set TARG. Note that when MPE001X is scheduled, double quotation marks (" ") are used to distinguish the literals from the variables which are then passed to the IMFEXEC environment. If double quotation marks were not used, REXX would have interpreted EXEC(MPE001X) as a built-in function.

MPE001X is the REXX counterpart to MPE001C. The MPE001X REXX EXEC uses the REXX PARSE and ADDRESS commands along with the VALUE built-in function. MPE001X issues a VGET for IMFRC after the call to the RRES utility and then MPE001X VGETs the number of lines passed back from RRES utility. For this discussion, the following command was added:

---

```

IF DATATYPE(RRESROL1)1 = 'NUM' THEN DO /* IS IT NUMERIC? */
 IMFEXEC MSG "'RRESROL1 NOT NUMERIC, RRESROL1="RRESROL1"' "
 SIGNAL MPEXIT /* EXIT */
END

```

---

The REXX built-in function, `DATATYPE`, ensures that the number of lines is numeric. The `DATATYPE` function also can verify other characteristics. The `IMFEXEC MSG` facility requires the text of the message to be enclosed in single quotation marks, but within REXX, double and single quotation marks are interchangeable.

The samples use double quotation marks to tell REXX that the contents are literals so that REXX passes on the single quotation marks to the external environment, `IMFEXEC`. The `SIGNAL` command of REXX can be used to branch or trap certain conditions. REXX does not have a `GOTO` command so loops or branches must be controlled by `SIGNAL`, `LEAVE`, or `CALL` commands.

If the UCB in the `IOS071I` message has an outstanding reserve, `MPE001X` schedules the `MPE002X EXEC`. `MPE002X` issues an `ALERT` back to the system requesting the information about outstanding reserves. `MPE002X` is functionally equivalent to `MPE002C`.

BMC Software distributes two REXX samples, `MPE002X` and `MPE002X2`. Both use the REXX `PARSE` and `ADDRESS` instructions and the difference between `MPE002X` and `MPE002X2` is how they build text for `ALERT`s. `MPE002X` uses single and double quotation marks and `MPE002X2` uses string concatenations.

An `ALERT KEY` is built with the following instruction:

```
ALERTKEY=INSERT(SYSID,UCB)
```

Using the REXX `INSERT` function, a unique `ALERT KEY` is built. This instruction inserts the value of `SYSID` before the value of `UCB`, which is placed subsequently in a variable called `ALERTKEY`.

`MPE002X` issues the `ALERT` with the following instruction:

```
"IMFEXEC ALERT" ALERTKEY,
 "' .MPE002X JOB "JOBNAME " ON SYSTEM "SYSID" USING ",
 UCB" HELD BY SYSTEM "SS"' " "COLOR(WHITE)"
```

**Note:** Commas indicate continuation in REXX.

There are seven pairs of double quotation marks and one pair of single quotation marks in the above instruction. The same `ALERT` is issued with the following set of instructions in `MPE002X2`.

---

```

WORK1=" ' " /* DEFINE LEADING/TRAILING QUOTE */
WORK2=' .MPE002X2 JOB ' /* FIRST PART OF THE MESSAGE */

/* CONCATENATE WORK1, WORK2 AND MORE OF THE TEXT */
WORK3=WORK1||WORK2||JOBNAME||' ON SYSTEM 'SYSID' USING 'UCB

/* BUILD REST OF THE TEXT WITH THE DELIMITING QUOTE AT END */
WORK4=' , HELD BY SYSTEM '||SS||WORK1

TEXT=INSERT(WORK3,WORK4) /* INSERT WORK3 INFRONT OF WORK4 */
"IMFEXEC ALERT" ALERTKEY TEXT "COLOR(WHITE)"

```

---

MPE002X and MPE002X2 are designed to demonstrate the use of quotation marks and string concatenations in REXX. The choice is really stylistic; both results are the same.

### EXECs for REXX DASD Reserve Analysis

|                 |                                                           |
|-----------------|-----------------------------------------------------------|
| <b>IOS071IX</b> | Schedules remote EXECs threshold counters                 |
| <b>MPE001X</b>  | Examines currently held reserves (runs on remote systems) |
| <b>MPE002X</b>  | Issues ALERT back to requesting system                    |
| <b>MPE002X2</b> | Issues ALERT back to requesting system                    |

## REXX QUEUE/PULL and VPUT/VGET Usage

Two sample EXECs, MUT002X and MUT003X, are distributed to show the use of REXX QUEUE/PULL and IMFEXEC's VPUT/VGET instructions. As with all REXX EXECs, the PARSE and ADDRESS commands are used. After these commands, MUT002X calls MUT003X to issue the MVS commands, D R,L. When entered, MUT003X establishes the IMFEXEC as the external environment with the ADDRESS instruction.

The following command displays the outstanding replies:

```
"IMFEXEC CMD 'D R,L' RESPONSE(IEE112I) WAIT(20)"
```

Upon return, the response lines are in the local pool. The variable IMFNOL contains the number of lines returned. The variable NUMLINES is ASSIGNED the values of IMFNOL and VPUT to the local pool.

MUT003X places information into the MAINVIEW AutoOPERATOR local pool and the REXX EXTENDED DATA QUEUE with the following set of instructions:

---

```
DO N=1 TO IMFNOL BY 1 UNTIL N>IMFNOL
 "IMFEXEC VDCL REXXL"N" LIST(TEXT B C D E F)"
 "IMFEXEC VGET LINE"N" INTO(REXXL"N") LOCAL"
 "IMFEXEC VPUT LINE."N" FROM(REXXL"N") LOCAL"
 QUEUE 'LINE.'N TEXT B C D E F
END
```

---

Although 'LINE'.N looks like a REXX STEM, a specific queued line cannot be referenced by the PULL command; therefore the pseudo stem, 'LINE'.N, becomes a part of the data that queued.

The QUEUE command builds the extended data queue. After the loop is completed, MUT003X issues the RETURN command and processing is continued in MUT002X.

Upon return from MUT003X, MUT002X uses the REXX built-in function QUEUED to establish the number of lines queued and displays this information before setting up the loop to PULL from the extended data queue. The following sequence of instructions is executed:

---

```
CNT=QUEUED()
IMFEXEC MSG '.MUT002X: THE NUMBER OF QUEUED LINES
IS: 'CNT
DO N=1 TO CNT BY 1 UNTIL N>CNT
 PULL LINE TEXT B C D E F
 IMFEXEC MSG '.MUT002X: PULL VARIABLES ARE:' LINE
TEXT B C D E F
END
```

---

Notice that LINE is considered a part of the data that is queued and not a REXX STEM. REXX discards the data once it has been pulled from the extended data queue. If you want to erase the data queue, build a PULL loop without specifying an argument template. The PULL instruction also can be specified as PARSE PULL.

MUT002X continues execution by getting NUMLINES from the LOCAL POOL and setting up a similar loop to issue VDCL and VGET instructions to derive the values that were stored in the LOCAL POOL by MUT003X.

**EXECs for REXX QUEUE/PULL and VPUT/VGET Usage**

- MUT002X**      Invokes MUT003X to gather data then VGET the data from the LOCAL POOL and PULL the data from the REXX DATA QUEUE
- MUT003X**      Issues the MVS command `D R, L` and places the data from the response in the LOCAL POOL and the REXX DATA QUEUE



---

---

# Appendix C MVS Solution Variables

To ensure that the MVS Solutions function properly in your environment, you must establish values for several variables.

Table C-1 lists all MVS Solution variables, their default values, and the solutions each one affects.

Edit member MSU002C in the BBPROC data set, distributed in MAINVIEW AutoOPERATOR, to set values for the appropriate variables.

A Rule for message PM0010I is required to schedule MSU002C upon PAS initialization.

**Table C-1 MVS Solution Variables (Part 1 of 2)**

| <b>Name</b> | <b>Description</b>                                      | <b>Default</b> | <b>Solutions</b>         |
|-------------|---------------------------------------------------------|----------------|--------------------------|
| dsmm1mig    | ML1 migration in process flag for DASD/Space Monitoring | n              | Dump Data Set Monitoring |
| dumpcler    | Task to clear dump data sets                            | None           | Dump Data Set Monitoring |
| dumpmf      | Minimum number of dump data sets to keep clear          | 1              | Dump Data Set Monitoring |
| dumpnds     | Total number of dump data sets                          | 4              | Dump Data Set Monitoring |
| lbgclas     | Class priority list from high to low                    | MDRAI53        | Load Balancing           |
| lbgcpuh     | CPU utilization to decrease workload                    | 90             | Load Balancing           |
| lbgcpul     | CPU utilization to increase workload                    | 50             | Load Balancing           |
| lbgibeg     | Beginning initiator number to manage                    | None           | Load Balancing           |
| lbgidec     | Number of initiators to stop                            | 1              | Load Balancing           |
| lbiend      | Ending initiator number to manage                       | None           | Load Balancing           |
| lbiinc      | Number of initiators to start                           | 2              | Load Balancing           |

**Table C-1 MVS Solution Variables (continued) (Part 2 of 2)**

| <b>Name</b> | <b>Description</b>                                                                        | <b>Default</b> | <b>Solutions</b>                                     |
|-------------|-------------------------------------------------------------------------------------------|----------------|------------------------------------------------------|
| lbgpage     | Page rate to decrease workload                                                            | xxx            | Load Balancing                                       |
| logrec      | Task name to clear SYS1.LOGREC                                                            | None           | Logrec Data Set Monitoring                           |
| maxacsa     | Maximum extended CSA utilization                                                          | 80             | Performance Management                               |
| maxbcsa     | Maximum CSA utilization below the limit                                                   | 80             | Performance Management                               |
| maxccpu     | Maximum complex CPU utilization                                                           | 95             | Performance Management                               |
| maxdevu     | Maximum device utilization                                                                | 80             | Performance Management                               |
| maxtcpu     | Maximum TSO CPU utilization                                                               | 50             | Performance Management                               |
| mvscall     | Name of the support person to be paged; this name must be defined to the Elan Workstation | None           | LOGREC Data Set Monitoring<br>VSAM Failures          |
| smfalt      | Suffix of alternate SMF parameters                                                        | None           | SMF Data Set Monitoring                              |
| smfclear    | Task to dump SMF data sets                                                                | None           | SMF Data Set Monitoring                              |
| sysbeep     | Information to be placed on pager                                                         | None           | WTO Buffer Monitoring                                |
| sysjes      | Version, release, and modification level of JES                                           | SP3.1.3        | Solutions that depend upon release-specific messages |
| sysmvs      | Version, release, and modification level of MVS                                           | SP4.2.2        | Solutions that depend upon release-specific messages |
| sysn        | Number of MVS systems in shared DASD complex                                              | 2              | DASD Reserve Analysis<br>Shared DASD Control         |
| sysprog     | TSO USERID of primary system programmer to receive warning messages                       | None           | WTO Buffer Monitoring<br>Logrec Data Set Monitoring  |
| sys1 - sysn | System IDs of systems in a shared DASD configuration                                      | None           | DASD Reserve Analysis                                |

---

---

# Appendix D CICS Solution Variables

To ensure that the CICS Solutions function properly in your environment, you must establish values for several variables.

Table D-1 lists all CICS Solution variables, their default values, and the solutions each one affects.

Edit member CSUINIT in the BBPROC data set, distributed with MAINVIEW AutoOPERATOR, to set values for the appropriate variables.

If JRNLEXEC=YES is specified in BBPARM member BBISSP00, MSU002C is automatically scheduled to execute when the PM0010I BBI/PM Initialization Complete message is received. Therefore, it sets the variable values each time the AutoOPERATOR subsystem is started.

If JRNLEXEC=N is specified, or JRNLEXEC is not specified, a Rule is required for PM0010I.

The CICS Solution variables also can be set by an operator. To reset the CICS Solution variables, enter:

```
%CSUINIT
```

**Table D-1 CICS Solution Variables (Part 1 of 2)**

| Name                | Description                                                   | Default | Solutions                                                                                                                                                                             |
|---------------------|---------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FOCALPT             | SSID of MAINVIEW AutoOPERATOR subsystem to receive all ALERTs | None    | <ul style="list-style-type: none"><li>• Error Recovery</li><li>• Performance Management</li></ul>                                                                                     |
| ONLCNT01 - ONLCNT0n | Name of the controlling subsystem                             | None    | <ul style="list-style-type: none"><li>• Error Recovery</li><li>• File Degradation Analysis</li><li>• VSAM Control Split Monitor</li><li>• Transaction Response Time Monitor</li></ul> |

**Table D-1 CICS Solution Variables (continued) (Part 2 of 2)**

| <b>Name</b>            | <b>Description</b>                           | <b>Default</b> | <b>Solutions</b>                                                                                                                                                                           |
|------------------------|----------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ONLALT01 -<br>ONLALT0n | Color of ALERTs messages for target system n | RED            | <ul style="list-style-type: none"> <li>• Error Recovery</li> <li>• File Degradation Analysis</li> <li>• VSAM Control Split Monitor</li> <li>• Transaction Response Time Monitor</li> </ul> |
| ONLTYP01 -<br>ONLTYP0n | Type of target system n or BBI-SSn           | None           | <ul style="list-style-type: none"> <li>• Error Recovery</li> <li>• File Degradation Analysis</li> <li>• VSAM Control Split Monitor</li> <li>• Transaction Response Time Monitor</li> </ul> |
| ONLALM01 -<br>ONLALM0n | Alarm indicator for ALERT in target system n | Y              | <ul style="list-style-type: none"> <li>• Error Recovery</li> <li>• File Degradation Analysis</li> <li>• VSAM Control Split Monitor</li> <li>• Transaction Response Time Monitor</li> </ul> |
| ONLSSN                 | Number of online subsystems                  | 4              | <ul style="list-style-type: none"> <li>• Error Recovery</li> <li>• File Degradation Analysis</li> <li>• VSAM Control Split Monitor</li> <li>• Transaction Response Time Monitor</li> </ul> |
| ONLSS01 -<br>ONLSS0n   | Names of the target subsystems               | None           | <ul style="list-style-type: none"> <li>• Error Recovery</li> <li>• File Degradation Analysis</li> <li>• VSAM Control Split Monitor</li> <li>• Transaction Response Time Monitor</li> </ul> |

---

---

# Appendix E DB2 Solution Variables and Parameters

To ensure that the DB2 Solutions function properly in your environment, you must establish values for several variables and determine threshold parameters.

## Data Sets Containing Variables

DB2 Solution variables are found in the following data sets:

hilevel.UBBPROC(DSU001C)

hilevel.UBBPROC(DSU101C)

hilevel.UBBPARM(BBIISP00)

hilevel.UBBPARM(BBISSP00)

**DSU001C** An EXEC that initializes DB2 variables required for all DB2 Solutions.

**DSU101C** An EXEC that initializes variables per DB2 subsystem. You can have as many as nine DB2 subsystems. Variables for these additional subsystems are set by copying member DSU101C and renaming the member:

---

**DSU10nC90**, where *n* is the DB2 subsystem (1-9) for which you are setting variables.

**BBIISP00** Contains a startup list to which you add BLK members DPE002B and DPE030B during initial customization.

**BBISSP00** Contains Rules parameters that you update during initial customization.

**Note:** See the *MAINVIEW Common Customization Guide* for information on the installation of UBBPARM and UBBPROC data sets.

## Data Sets Containing Threshold Parameters

DB2 threshold parameters are found in these data sets:

hilevel.UBBPARM(DPE002B)

hilevel.UBBPARM(DPE030B)

hilevel.UBBPARM(DMRBEX00)

**DPE002B** DPE002B and DPE030B contain parameters that specify the names of monitors you add during initial customization of the DB2 Solutions.

**DPE030B** See DEP002B.

**DMRBEX00** Contains parameters for setting threshold levels in the DB2RNWY Solution during initial customization of the DB2 Solutions.

## Tables That Describe Variables and Parameters

Variables and threshold parameters for the DB2 Solutions are organized in tables according to the solutions each one affects:

|                           |           |
|---------------------------|-----------|
| <b>All DB2 Solutions</b>  | Table E-1 |
| <b>DB2DLOK</b>            | Table E-2 |
| <b>DB2RESP Variables</b>  | Table E-3 |
| <b>DB2RESP Thresholds</b> | Table E-4 |
| <b>DB2RNWY</b>            | Table E-5 |
| <b>DB2TFUL</b>            | Table E-6 |
| <b>DB2THRD</b>            | Table E-7 |

**Note:** You must set the following two variables listed in the **All DB2 Solutions** (see Table E-1):

- DB2
- D\_DB2NUM

These variables are part of the initial environment set up and it is mandatory that you set both of them before using any of the DB2 Solutions.

The rest of the variables found in the following five tables are optional, and defaults are provided for them.

### All DB2 Solutions

**Table E-1** Variables for All DB2 Solutions in hilevel.UBBPROC (Part 1 of 2)

| Variable Name   | Description                                                                                    | Default | Data Set Member |
|-----------------|------------------------------------------------------------------------------------------------|---------|-----------------|
| d_db2num        | Number of DB2s monitored by this subsystem<br><b>Note:</b> Setting this variable is mandatory. | 1       | DSU001C         |
| d_alert_ids     | USERIDs to be notified of DB2 Alerts                                                           | Null    | DSU001C         |
| d_alert_q       | Queue name to use for Alerts                                                                   | DB2     | DSU001C         |
| d_alert_send    | Indicates (Y N) that SEND command is to be issued                                              | N       | DSU001C         |
| d_alert_sendopt | SEND option: either LOGON or NOW                                                               | NOW     | DSU001C         |

**Table E-1 Variables for All DB2 Solutions in hilevel.UBBPROC (Part 2 of 2)**

| Variable Name | Description                                                                                                                 | Default   | Data Set Member |
|---------------|-----------------------------------------------------------------------------------------------------------------------------|-----------|-----------------|
| db2A          | Name you supply to identify each DB2 subsystem                                                                              | DB2D      | DSU101C         |
| d_alert_tgt   | Target for MAINVIEW Alerts                                                                                                  | &IMFORGSS | DSU001C         |
| mstr          | DB2 MSTR address space name associated with this DB2 (for example, DB2AMSTR, DSNBMSTR, and so on)                           | &DB2.MSTR | DSU101C         |
| dbm1          | DB2 DBM1 address space name associated with this DB2 (for example, DB2ADB1, DSNBDBM1, and so on)                            | &DB2.DBM1 | DSU101C         |
| dist          | DB2 DIST address space name associated with this DB2 if applicable at your site (for example DB2ADIST, DSNBDIST, and so on) | &DB2.DIST | DSU101C         |
| irlm          | IRLM PROC name associated with this DB2 subsystems (for example DB2PROC, IRLMPROC, and so on)                               | &DB2.PROC | DSU101C         |
| imst          | Optional IMS target name associated with this DB2 subsystem (null if not applicable)                                        | Null      | DSU101C         |

## DB2DLOK

**Table E-2 DB2DLOK Variables in hilevel.UBBPROC (Part 1 of 2)**

| Variable Name | Description                                                                                                                                                                                 | Default    | Data Set Member |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|
| cnt           | Total number of deadlock/timeout history entries to be maintained in the dynamic Deadlock History Table for this DB2 subsystem                                                              | 20         | DSU101C         |
| intvl         | Length of time in seconds to wait between LOCKD displays; this should be half your IRLM deadlock time                                                                                       | 5          | DSU101C         |
| max_age       | Discard deadlock events over this age (rolling time interval in minutes that a particular plan involved in deadlock/time can be considered a candidate for analysis for this DB2 subsystem) | 30 minutes | DSU101C         |
| maxeither     | Maximum number of times that a plan can be EITHER a lock owner or a lock requestor in a deadlock/timeout within the MAX_AGE time interval before triggering the Deadlock Analysis Solution  | 3          | DSU101C         |
| maxowner      | Maximum number of times that a plan can be a lock OWNER in a deadlock/timeout within the MAX_AGE time interval before triggering the Deadlock Analysis Solution                             | 2          | DSU101C         |

**Table E-2 DB2DLOK Variables in hilevel.UBBPROC (Part 2 of 2)**

| Variable Name | Description                                                                                                                                                                 | Default    | Data Set Member |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|
| maxreq        | Maximum number of times that a plan can be a lock REQUESTOR in a deadlock/timeout within the MAX_AGE time interval before triggering the Deadlock Analysis/Timeout Solution | 2          | DSU101C         |
| stoptime      | Length of time in minutes to run the LOCKD data extractor to analyze lock contentions                                                                                       | 10 minutes | DSU101C         |

**DB2RESP Variables****Table E-3 DB2RESP Variables in hilevel.UBBPROC (Part 1 of 2)**

| Variable Name | Description                                                         | Default               | Data Set Member |
|---------------|---------------------------------------------------------------------|-----------------------|-----------------|
| max_tsoelap   | Maximum elapsed time per TSO user                                   | 00:01:00 (1 minute)   | DSU101C         |
| max_tsostmt   | Maximum number of SQL statements issued per TSO user                | 500                   | DSU101C         |
| max_tsolock   | Maximum number of LOCKS held per TSO user                           | 500                   | DSU101C         |
| max_batelap   | Maximum elapsed time per BATCH transaction                          | 01:00:00 (1 hour)     | DSU101C         |
| max_batstmt   | Maximum number of SQL statements issued per BATCH transaction       | 100,000               | DSU101C         |
| max_batlock   | Maximum number of LOCKs held per BATCH transaction                  | 2,000                 | DSU101C         |
| max_utlelap   | Maximum elapsed time per UTILITY transaction                        | 00:30:00 (30 minutes) | DSU101C         |
| max_utlstmt   | Maximum number of SQL statements issued per UTILITY transaction     | 0                     | DSU101C         |
| max_utllock   | Maximum number of LOCKs held per UTILITY transaction                | 50                    | DSU101C         |
| max_cafelap   | Maximum elapsed time per CAF transaction                            | 00:30:00 (30 minutes) | DSU101C         |
| max_cafstmt   | Maximum number of SQL statements issued per CAF transaction         | 100,000               | DSU101C         |
| max_caflock   | Maximum number of LOCKs held per CAF transaction                    | 2,000                 | DSU101C         |
| max_tpelap    | Maximum elapsed time per CICS or IMS transaction                    | 00:00:05 (5 seconds)  | DSU101C         |
| max_tpstmt    | Maximum number of SQL statements issued per CICS or IMS transaction | 100                   | DSU101C         |
| max_tpllock   | Maximum number of LOCKs held per CICS or IMS transaction            | 100                   | DSU101C         |

**Table E-3 DB2RESP Variables in hilevel.UBBPROC (Part 2 of 2)**

| <b>Variable Name</b> | <b>Description</b>                                                                                            | <b>Default</b> | <b>Data Set Member</b> |
|----------------------|---------------------------------------------------------------------------------------------------------------|----------------|------------------------|
| max_edmfails         | Maximum number of EDM pool failures per minute                                                                | 0              | DSU101C                |
| max_edmloads         | Maximum percent of EDM pool requests needing loads                                                            | 20%            | DSU101C                |
| maxbfr_unavail       | Maximum number of buffer unavailable conditions per minute                                                    | 0              | DSU101C                |
| maxalloc_delay       | Maximum number of allocation delay conditions per minute                                                      | 0              | DSU101C                |
| max_ridut            | Maximum RID pool percent utilization                                                                          | 80%            | DSU101C                |
| max_bfexp            | Maximum number of buffer pool expansions per minute                                                           | 0              | DSU101C                |
| max_bfrdmc           | Maximum number of Data Manager Critical conditions per minute                                                 | 0              | DSU101C                |
| max_bfriw            | Maximum number of Immediate Write conditions per minute                                                       | 0              | DSU101C                |
| min_getrio           | Minimum number of GETPAGES per read I/O in the INTVL                                                          | 2.0            | DSU101C                |
| min_swspws           | Minimum number of system page updates per system pages written in the INTVL                                   | 1.0            | DSU101C                |
| min_pswio            | Minimum number of system pages written per write I/O in the INTVL                                             | 5.0            | DSU101C                |
| resp_min             | Number of minutes between monitor warning messages before triggering the EXEC again if necessary              | 1              | DSU101C                |
| max_suspct           | Percent suspended threads (total active threads divided by total suspended threads)                           | 25%            | DSU101C                |
| max_thdutil          | Thread utilization (total active threads divided by maximum threads allowed)                                  | 90%            | DSU101C                |
| max_#susp            | Maximum suspensions per active thread per minute (suspensions per minute divided by number of active threads) | 1              | DSU101C                |
| max_#dead            | Maximum deadlocks per minute in the interval                                                                  | 0              | DSU101C                |
| max_#timeout         | Maximum timeouts per minute in the interval                                                                   | 0              | DSU101C                |
| max_pagepct          | Maximum DB2 paging as a percent of total system (DB2 paging divided by total system paging)                   | 10%            | DSU101C                |
| max_edmut            | Maximum EDM pool utilization                                                                                  | 80%            | DSU101C                |
| max_openpct          | Maximum open data set utilization                                                                             | 90%            | DSU101C                |

## DB2RESP Monitor Thresholds

**Table E-4 Monitor Thresholds for DB2RESP in hilevel.UBBPARM**

| Monitor | Connection | Description                 | Threshold   | Data Set Member |
|---------|------------|-----------------------------|-------------|-----------------|
| @ELAP   | IMS        | Average elapsed time        | 5 seconds   | DPE002B         |
| @ELPD   | IMS        | Average elapsed time in DB2 | 3 seconds   | DPE002B         |
| @CPU    | IMS        | Average CPU time            | 0.5 seconds | DPE002B         |
| @CPUD   | IMS        | Average CPU time in DB2     | 0.3 seconds | DPE002B         |
| @ELAP   | TSO        | Average elapsed time        | 15 seconds  | DPE002B         |
| @ELPD   | TSO        | Average elapsed time in DB2 | 5 seconds   | DPE002B         |
| @CPU    | TSO        | Average CPU time            | 1 second    | DPE002B         |
| @CPUD   | TSO        | Average CPU time in DB2     | 0.5 seconds | DPE002B         |
| @ELAP   | CICS       | Average elapsed time        | 5 seconds   | DPE002B         |
| @ELPD   | CICS       | Average elapsed time in DB2 | 3 seconds   | DPE002B         |
| @CPU    | CICS       | Average CPU time            | 0.5 seconds | DPE002B         |
| @CPUD   | CICS       | Average CPU time in DB2     | 0.3 seconds | DPE002B         |
| @CPU    | BATCH      | Average CPU time            | 0.5 seconds | DPE002B         |
| @CPUD   | BATCH      | Average CPU time in DB2     | 0.3 seconds | DPE002B         |

## DB2RNWY

**Table E-5 DB2RNWY Threshold Parameters in hilevel.UBBPARM**

| Keyword     | Connection | Threshold Parameter  | Data Set Member |
|-------------|------------|----------------------|-----------------|
| MSG=DZ0610W | IMS        | GPRATE=200 CYCLES=3  | DMRBEX00        |
| MSG=DZ0620W | CICS       | GPRATE=200 CYCLES=3  | DMRBEX00        |
| MSG=DZ0630W | TSO        | GPRATE=200 CYCLES=3  | DMRBEX00        |
| MSG=DZ0640W | BATCH      | GPRATE=500 CYCLES=3  | DMRBEX00        |
| MSG=DZ0650W | CAF        | GPRATE=500 CYCLES=3  | DMRBEX00        |
| MSG=DZ0660W | UTILITY    | GPRATE=1000 CYCLES=3 | DMRBEX00        |

## DB2TFUL

**Table E-6 DB2TFUL Variables in hilevel.UBBPROC**

| Variable Name         | Description                                                                                                                                                                                                           | Default              | Data Set Member |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------|
| MAX_UTIL              | Default maximum database/tablespace (DB/TS) utilization for all DB/TSs associated with this subsystem; zero means no default threshold<br>This value can be overridden for specific DB/TSs within each DB2 subsystem. | 0                    | DSU101C         |
| MAX_EXTS              | Default maximum number of extents for all DB/TSs associated with this DB2 subsystem<br>This value can be overridden for specific DB/TSs within each DB2 subsystem.                                                    | 0                    | DSU101C         |
| NUM                   | Total number of overrides for this DB2 subsystem                                                                                                                                                                      | 4                    | DSU101C         |
| NAME <sub>n</sub>     | <i>N</i> th DBTS name to be overridden for percent space utilization and extent monitoring for this DB2 subsystem<br>Generic DBTS names may be used.                                                                  | NA                   | DSU101C         |
| NAME1                 | First DBTS name                                                                                                                                                                                                       | DSN*                 | DSU101C         |
| NAME2                 | Second DBTS name                                                                                                                                                                                                      | DSNDB06_<br>DSNAPH01 | DSU101C         |
| NAME3                 | Third DBTS name                                                                                                                                                                                                       | DSNDB07_<br>DSN4K01  | DSU101C         |
| NAME4                 | Fourth DBTS name                                                                                                                                                                                                      | DSNDB06_<br>SYS*     | DSU101C         |
| MAX_UTIL <sub>n</sub> | Utilization threshold for all DB/TSs that satisfy the NAME <sub>n</sub> qualification<br>Zero means ignore percent utilization.                                                                                       | NA                   | DSU101C         |
| MAX_UTIL1             | Utilization threshold for NAME1                                                                                                                                                                                       | 0                    | DSU101C         |
| MAX_UTIL2             | Utilization threshold for NAME2                                                                                                                                                                                       | 90                   | DSU101C         |
| MAX_UTIL3             | Utilization threshold for NAME3                                                                                                                                                                                       | 50                   | DSU101C         |
| MAX_UTIL4             | Utilization threshold for NAME4                                                                                                                                                                                       | 50                   | DSU101C         |
| MAX_EXTS <sub>n</sub> | Extent threshold for all DB/TS's that satisfy the NAME <sub>n</sub> qualification<br>Zero means ignore percent utilization.                                                                                           | NA                   | DSU101C         |
| MAX_EXTS1             | Extent override for NAME1                                                                                                                                                                                             | 0                    | DSU101C         |
| MAX_EXTS2             | Extent override for NAME2                                                                                                                                                                                             | 1                    | DSU101C         |
| MAX_EXTS3             | Extent override for NAME3                                                                                                                                                                                             | 20                   | DSU101C         |
| MAX_EXTS4             | Extent override for NAME4                                                                                                                                                                                             | 1                    | DSU101C         |

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**DB2THRD****Table E-7 DB2TFUL Variables in hilevel.UBBPROC**

| <b>Variable Name</b> | <b>Description</b>                                                        | <b>Default</b> | <b>Data Set Member</b> |
|----------------------|---------------------------------------------------------------------------|----------------|------------------------|
| Q_VERIFY             | Indicates (Y N) whether or not to issue an ALERT to verify the TSO cancel | Y              | DSU101C                |

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# Glossary

This glossary defines BMC Software terminology. Other dictionaries and glossaries can be used in conjunction with this glossary.

Since this glossary pertains to BMC Software-related products, some of the terms defined might not appear in this book.

To help you find the information you need, this glossary uses the following cross-references:

*Contrast with* indicates a term that has a contrary or contradictory meaning.

*See* indicates an entry that is a synonym or contains expanded information.

*See also* indicates an entry that contains related information.

|                            |                                                                                                                                                                   |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>action</b>              | Defined operation, such as modifying a MAINVIEW window, that is performed in response to a command. <i>See</i> object.                                            |
| <b>active window</b>       | Any MAINVIEW window in which data can be refreshed. <i>See</i> alternate window, current window, window.                                                          |
| <b>administrative view</b> | Display from which a product's management tasks are performed, such as the DSLIST view for managing historical data sets. <i>See</i> view.                        |
| <b>ALT WIN field</b>       | Input field that allows you to specify the window identifier for an alternate window where the results of a hyperlink are displayed. <i>See</i> alternate window. |
| <b>Alternate Access</b>    | <i>See</i> MAINVIEW Alternate Access.                                                                                                                             |
| <b>alternate form</b>      | View requested through the FORM command that changes the format of a previously displayed view to show related information. <i>See also</i> form, query.          |

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**alternate window** (1) Window that is specifically selected to display the results of a hyperlink. (2) Window whose identifier is defined to the ALT WIN field. *Contrast with* current window. *See* active window, window, ALT WIN field.

**analyzer** (1) Online display that presents a snapshot of status and activity data and indicates problem areas. (2) Component of CMF MONITOR. *See* CMF MONITOR Analyzer.

**application** (1) Program that performs a specific set of tasks within a MAINVIEW product. (2) In MAINVIEW VistaPoint, combination of workloads to enable display of their transaction performance data in a single view.

**application trace** *See* trace.

**ASCH workload** Workload comprising Advanced Program-to-Program Communication (APPC) address spaces.

**AutoCustomization** Online facility for customizing the installation of products. AutoCustomization provides an ISPF panel interface that both presents customization steps in sequence and provides current status information about the progress of the installation.

**automatic screen update**

Usage mode wherein the currently displayed screen is refreshed automatically with new data at an interval you specify. Invoked by the ASU command.

**batch workload** Workload consisting of address spaces running batch jobs.

**BBI** Basic architecture that distributes work between workstations and multiple OS/390 targets for BMC Software MAINVIEW products.

**BBI-SS PAS** *See* BBI subsystem product address space.

**BBI subsystem product address space (BBI-SS PAS)**

OS/390 subsystem address space that manages communication between local and remote systems and that contains one or more of the following products:

- MAINVIEW AutoOPERATOR
- MAINVIEW for CICS
- MAINVIEW for DB2
- MAINVIEW for DBCTL
- MAINVIEW for IMS Online
- MAINVIEW for WebSphere MQ
- MAINVIEW for WebSphere MQ Integrator
- MAINVIEW SRM

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|                             |                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | <ul style="list-style-type: none"> <li>• MAINVIEW VistaPoint (for CICS, DB2, DBCTI, and IMS workloads)</li> </ul>                                                                                                                                                                                                                                    |
| <b>BBPARM</b>               | <i>See</i> parameter library.                                                                                                                                                                                                                                                                                                                        |
| <b>BBPROC</b>               | <i>See</i> procedure library.                                                                                                                                                                                                                                                                                                                        |
| <b>BBPROF</b>               | <i>See</i> profile library.                                                                                                                                                                                                                                                                                                                          |
| <b>BBSAMP</b>               | <i>See</i> sample library.                                                                                                                                                                                                                                                                                                                           |
| <b>BBV</b>                  | <i>See</i> MAINVIEW Alternate Access.                                                                                                                                                                                                                                                                                                                |
| <b>BBXS</b>                 | BMC Software Subsystem Services. Common set of service routines loaded into common storage and used by several BMC Software MAINVIEW products.                                                                                                                                                                                                       |
| <b>border</b>               | Visual indication of the boundaries of a window.                                                                                                                                                                                                                                                                                                     |
| <b>bottleneck analysis</b>  | Process of determining which resources have insufficient capacity to provide acceptable service levels and that therefore can cause performance problems.                                                                                                                                                                                            |
| <b>CA-Disk</b>              | Data management system by Computer Associates that replaced the DMS product.                                                                                                                                                                                                                                                                         |
| <b>CAS</b>                  | Coordinating address space. One of the address spaces used by the MAINVIEW windows environment architecture. The CAS supplies common services and enables communication between linked systems. Each OS/390 or z/OS image requires a separate CAS. Cross-system communication is established through the CAS using VTAM and XCF communication links. |
| <b>CFMON</b>                | <i>See</i> coupling facility monitoring.                                                                                                                                                                                                                                                                                                             |
| <b>chart</b>                | Display format for graphical data. <i>See also</i> graph.                                                                                                                                                                                                                                                                                            |
| <b>CICSplex</b>             | User-defined set of one or more CICS systems that are controlled and managed as a single functional entity.                                                                                                                                                                                                                                          |
| <b>CMF MONITOR</b>          | Comprehensive Management Facility MONITOR. Product that measures and reports on all critical system resources, such as CPU, channel, and device usage; memory, paging, and swapping activity; and workload performance.                                                                                                                              |
| <b>CMF MONITOR Analyzer</b> | Batch component of CMF MONITOR that reads the SMF user and 70 series records created by the CMF MONITOR Extractor and/or the RMF Extractor and formats them into printed system performance reports.                                                                                                                                                 |

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## CMF MONITOR Extractor

Component of CMF that collects performance statistics for CMF MONITOR Analyzer, CMF MONITOR Online, MAINVIEW for OS/390, and RMF postprocessor. *See* CMF MONITOR Analyzer, CMF MONITOR Online, MAINVIEW for OS/390.

## CMF MONITOR Online

Component of CMF that uses the MAINVIEW window interface to present data on all address spaces, their use of various system resources, and the delays that each address space incurs while waiting for access to these resources. *See* CMF MONITOR, MAINVIEW for OS/390.

**CMF Type 79 API** Application programming interface, provided by CMF, that provides access to MAINVIEW SMF-type 79 records.

**CMFMON** Component of CMF MONITOR that simplifies online retrieval of information about system hardware and application performance and creates MAINVIEW SMF-type 79 records.

The CMFMON *online facility* can be used to view data in one or more formatted screens.

The CMFMON *write facility* can be used to write collected data as MAINVIEW SMF-type 79 records to an SMF or sequential data set.

**CMRDETL** MAINVIEW for CICS data set that stores detail transaction records (type 6E) and abend records (type 6D). Detail records are logged for each successful transaction. Abend records are written when an abend occurs. Both records have the same format when stored on CMRDETL.

**CMRSTATS** MAINVIEW for CICS data set that stores both CICS operational statistic records, at five-minute intervals, and other records, at intervals defined by parameters specified during customization (using CMRSOPT).

**column** Vertical component of a view or display, typically containing fields of the same type of information, that varies by the objects associated in each row.

**collection interval** Length of time data is collected. *See also* delta mode, total mode.

**command delimiter** Special character, usually a ; (semicolon), used to stack commands typed concurrently on the COMMAND line for sequential execution.

**COMMAND line** Line in the control area of the display screen where primary commands can be typed. *Contrast with* line command column.

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## Command MQ Automation D/S

Command MQ agents, which provide local proactive monitoring for both MQSeries and MSMQ (Microsoft message queue manager). The Command MQ agents operate at the local node level where they continue to perform functions regardless of the availability of the MQM (message queue manager) network. Functionality includes automatic monitoring and restarts of channels, queue managers, queues and command servers. In cases where automated recovery is not possible, the agents transport critical alert information to a central console.

## Command MQ Automation S/390

Command MQ component, which monitors the MQM (message queue manager) networks and intercedes to perform corrective actions when problems arise. Solutions include:

- Dead-Letter Queue management
- System Queue Archival
- Service Interval Performance solutions
- Channel Availability

These solutions help ensure immediate relief to some of the most pressing MQM operations and performance problems.

## Command MQ for D/S

Command MQ for D/S utilizes a true client/server architecture and employs resident agents to provide configuration, administration, performance monitoring and operations management for the MQM (message queue manager) network.

## Command MQ for S/390

*See MAINVIEW for WebSphere MQ.*

## COMMON STORAGE MONITOR

Component of MAINVIEW for OS/390 that monitors usage and reconfigures OS/390 or z/OS common storage blocks.

## composite workload

Workload made up of a WLM workload or other workloads, which are called *constituent workloads*.

## constituent workload

Member of a composite workload. Constituent workloads in a composite usually belong to a single workload class, but sometimes are mixed.

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|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>contention</b>                           | Occurs when there are more requests for service than there are servers available.                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>context</b>                              | In a Plex Manager view, field that contains the name of a target or group of targets specified with the CONTEXT command. <i>See</i> scope, service point, SSI context, target context.                                                                                                                                                                                                                                                                               |
| <b>CONTEXT command</b>                      | Specifies either a MAINVIEW product and a specific target for that product ( <i>see</i> target context) or a MAINVIEW product and a name representing one or more targets ( <i>see</i> SSI context) for that product.                                                                                                                                                                                                                                                |
| <b>control statement</b>                    | (1) Statement that interrupts a sequence of instructions and transfers control to another part of the program. (2) Statement that names samplers and other parameters that configure the MAINVIEW components to perform specified functions. (3) In CMF MONITOR, statement in a parameter library member used to identify a sampler in the extractor or a report in the analyzer, or to describe either component's processing requirements to the operating system. |
| <b>coupling facility monitoring (CFMON)</b> | Coupling facility views that monitor the activity of your system's coupling facilities.                                                                                                                                                                                                                                                                                                                                                                              |
| <b>current data</b>                         | Data that reflects the system in its current state. The two types of current data are real-time data and interval data. <i>Contrast with</i> historical data. <i>See also</i> interval data, real-time data.                                                                                                                                                                                                                                                         |
| <b>current window</b>                       | In the MAINVIEW window environment, window where the main dialog with the application takes place. The current window is used as the default window destination for commands issued on the COMMAND line when no window number is specified. <i>Contrast with</i> alternate window. <i>See</i> active window, window.                                                                                                                                                 |
| <b>DASD</b>                                 | (Direct Access Storage Device) (1) A device with rotating recording surfaces that provides immediate access to stored data. (2) Any device that responds to a DASD program.                                                                                                                                                                                                                                                                                          |
| <b>DASD ADVISOR</b>                         | An interactive software tool that diagnoses DASD performance problems and makes recommendations to reduce overall service time. This tool measures and reports on the operational performance of IBM and IBM-compatible devices.                                                                                                                                                                                                                                     |

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|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>data collector</b>                | Program that belongs to a MAINVIEW product and that collects data from various sources and stores the data in records used by views. For example, MAINVIEW for OS/390 data collectors obtain data from OS/390 or z/OS services, OS/390 or z/OS control blocks, CMF MONITOR Extractor control blocks, and other sources. <i>Contrast with</i> extractor.                                                                                                       |
| <b>delta mode</b>                    | (1) In MAINVIEW for DB2 analyzer displays, difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request. <i>See also</i> statistics interval. (2) In CMFMON, usage mode wherein certain columns of data reflect the difference in values between one sample cycle and the next. Invoked by the DELta ON command. <i>See also</i> collection interval, sample cycle, total mode. |
| <b>DFSMS</b>                         | (Data Facility Storage Management System) Data management, backup, and HSM software from IBM for OS/390 or z/OS mainframes.                                                                                                                                                                                                                                                                                                                                   |
| <b>DMR</b>                           | <i>See</i> MAINVIEW for DB2.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>DMS</b>                           | (Data Management System) <i>See</i> CA-Disk.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>DMS2HSM</b>                       | <i>See</i> MAINVIEW SRM DMS2HSM.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>DSO</b>                           | (Data Set Optimizer) CMF MONITOR Extractor component that uses CMF MONITOR Extractor data to produce reports specifying the optimal ordering of data sets on moveable head devices.                                                                                                                                                                                                                                                                           |
| <b>EasyHSM</b>                       | <i>See</i> MAINVIEW SRM EasyHSM.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>EasyPOOL</b>                      | <i>See</i> MAINVIEW SRM EasyPOOL.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>EasySMS</b>                       | <i>See</i> MAINVIEW SRM EasySMS.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>element</b>                       | (1) Data component of a data collector record, shown in a view as a field. (2) Internal value of a field in a view, used in product functions.                                                                                                                                                                                                                                                                                                                |
| <b>element help</b>                  | Online help for a field in a view. The preferred term is <i>field help</i> .                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Enterprise Storage Automation</b> | <i>See</i> MAINVIEW SRM Enterprise Storage Automation.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>event</b>                         | A message issued by Enterprise Storage Automation. User-defined storage occurrences generate events in the form of messages. These events provide an early warning system for storage problems and are routed to user-specified destinations for central viewing and management.                                                                                                                                                                              |

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|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Event Collector</b>    | Component for MAINVIEW for IMS Online, MAINVIEW for IMS Offline, and MAINVIEW for DBCTL that collects data about events in the IMS environment. This data is required for Workload Monitor and optional for Workload Analyzer (except for the workload trace service). This data also is recorded as transaction records (X'FA') and program records (X'F9') on the IMS system log for later use by the MAINVIEW for IMS Offline components: Performance Reporter and Transaction Accountant. |
| <b>expand</b>             | Predefined link from one display to a related display. <i>See also</i> hyperlink.                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>extractor</b>          | Program that collects data from various sources and keeps the data control blocks to be written as records. Extractors obtain data from services, control blocks, and other sources. <i>Contrast with</i> data collector.                                                                                                                                                                                                                                                                     |
| <b>extractor interval</b> | <i>See</i> collection interval.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>fast path</b>          | Predefined link between one screen and another. To use the fast path, place the cursor on a single value in a field and press <b>Enter</b> . The resulting screen displays more detailed information about the selected value. <i>See also</i> hyperlink.                                                                                                                                                                                                                                     |
| <b>field</b>              | Group of character positions within a screen or report used to type or display specific information.                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>field help</b>         | Online help describing the purpose or contents of a field on a screen. To display field help, place the cursor anywhere in a field and press <b>PF1</b> (HELP). In some products, field help is accessible from the screen help that is displayed when you press <b>PF1</b> .                                                                                                                                                                                                                 |
| <b>filter</b>             | Selection criteria used to limit the number of rows displayed in a view. Data that does not meet the selection criteria is not displayed. A filter is composed of an element, an operator, and an operand (a number or character string). Filters can be implemented in view customization, through the PARM/QPARM commands, or through the Where/QWhere commands. Filters are established against elements of data.                                                                          |
| <b>fire</b>               | The term used to indicate that an event has triggered an action. In MAINVIEW AutoOPERATOR, when a Rule selection criteria matches an incoming event and <i>fires</i> , the user-specified automation actions are performed. This process is also called <i>handling</i> the event.                                                                                                                                                                                                            |
| <b>fixed field</b>        | Field that remains stationary at the left margin of a screen that is scrolled either right or left.                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>FOCAL POINT</b>        | MAINVIEW product that displays a summary of key performance indicators across systems, sites, and applications from a single terminal.                                                                                                                                                                                                                                                                                                                                                        |

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|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>form</b>                | One of two constituent parts of a view; the other is query. A form defines how the data is presented; a query identifies the data required for the view. <i>See also</i> query, view.                                                                                                                                                                                                                                                                                                                                                        |
| <b>full-screen mode</b>    | Display of a MAINVIEW product application or service on the entire screen. There is no window information line. <i>Contrast with</i> windows mode.                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>global command</b>      | Any MAINVIEW window interface command that can affect all windows in the window area of a MAINVIEW display.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>graph</b>               | Graphical display of data that you select from a MAINVIEW window environment view. <i>See also</i> chart.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>hilevel</b>             | For MAINVIEW products, high-level data set qualifier required by a site's naming conventions.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>historical data</b>     | (1) Data that reflects the system as it existed at the end of a past recording interval or the duration of several intervals. (2) Any data stored in the historical database and retrieved using the TIME command. <i>Contrast with</i> current data, interval data and real-time data.                                                                                                                                                                                                                                                      |
| <b>historical database</b> | Collection of performance data written at the end of each installation-defined recording interval and containing up to 100 VSAM clusters. Data is extracted from the historical database with the TIME command. <i>See</i> historical data.                                                                                                                                                                                                                                                                                                  |
| <b>historical data set</b> | In MAINVIEW products that display historical data, VSAM cluster file in which data is recorded at regular intervals.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>HSM</b>                 | (Hierarchical Storage Management) Automatic movement of files from hard disk to slower, less-expensive storage media. The typical hierarchy is from magnetic disk to optical disk to tape.                                                                                                                                                                                                                                                                                                                                                   |
| <b>hyperlink</b>           | <p>(1) Preset field in a view or an EXPAND line on a display that permits you to</p> <ul style="list-style-type: none"> <li>• access cursor-sensitive help</li> <li>• issue commands</li> <li>• link to another view or display</li> </ul> <p>The transfer can be either within a single product or to a related display/view in a different BMC Software product. Generally, hyperlinked fields are highlighted. (2) Cursor-activated short path from a topic or term in online help to related information. <i>See also</i> fast path.</p> |

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**Image log** Collection of screen-display records. Image logs can be created for both the BBI-SS PAS and the BBI terminal session (TS).

The BBI-SS PAS Image log consists of two data sets that are used alternately: as one fills up, the other is used. Logging to the BBI-SS PAS Image log stops when both data sets are filled and the first data set is not processed by the archive program.

The TS Image log is a single data set that wraps around when full.

## **IMSPlex System Manager (IPSM)**

MVIMS Online and MVDBC service that provides Single System Image views of resources and bottlenecks for applications across one or more IMS regions and systems.

**interval data** Cumulative data collected during a collection interval. Intervals usually last from 15 to 30 minutes depending on how the recording interval is specified during product customization. *Contrast with* historical data.

**Note:** If change is made to the workloads, a new interval will be started.

*See also* current data and real-time data.

**InTune** Product for improving application program performance. It monitors the program and provides information used to reduce bottlenecks and delays.

**IRUF** IMS Resource Utilization File (IRUF). IRUFs can be either detail (one event, one record) or summarized (more than one event, one record). A detail IRUF is created by processing the IMS system log through a program called IMFLEEDIT. A summarized IRUF is created by processing one or more detail IRUFs, one or more summarized IRUFs, or a combination of both, through a sort program and the TASCOSTR program.

**job activity view** Report about address space consumption of resources. *See* view.

**journal** Special-purpose data set that stores the chronological records of operator and system actions.

**Journal log** Collection of messages. Journal logs are created for both the BBI-SS PAS and the BBI terminal session (TS).

The BBI-SS PAS Journal log consists of two data sets that are used alternately: as one fills up, the other is used. Logging to the BBI-SS PAS Journal log stops when both data sets are filled and the first data set is not being processed by the archive program.

The TS Journal log is a single data set that wraps around when full.

---

**line command** Command that you type in the line command column in a view or display. Line commands initiate actions that apply to the data displayed in that particular row.

**line command column**

Command input column on the left side of a view or display. *Contrast with* COMMAND line.

**Log Edit**

In the MAINVIEW for IMS Offline program named IMFLEEDIT, function that extracts transaction (X'FA') and program (X'F9') records from the IMS system log. IMFLEEDIT also extracts certain records that were recorded on the system log by IMS. IMFLEEDIT then formats the records into a file called the IMS Resource Utilization File (IRUF).

**MAINVIEW**

BMC Software integrated systems management architecture.

**MAINVIEW Alarm Manager (MV ALARM)**

In conjunction with other MAINVIEW products, notifies you when an exception occurs. MAINVIEW Alarm Manager is capable of monitoring multiple systems simultaneously, which means that MAINVIEW Alarm Manager installed on one system keeps track of your entire sysplex. You can then display a single view that shows exceptions for all MAINVIEW performance monitors within your OS/390 or z/OS enterprise.

**MAINVIEW Alternate Access**

Enables MAINVIEW products to be used without TSO by providing access through EXCP and VTAM interfaces.

**MAINVIEW Application Program Interface (MVAPI)**

A CLIST- or REXX-based, callable interface that allows MAINVIEW AutoOPERATOR EXECs to access MAINVIEW monitor product view data.

**MAINVIEW AutoOPERATOR**

Product that uses tools, techniques, and facilities to automate routine operator tasks and provide online performance monitoring, and that achieves high availability through error minimization, improved productivity, and problem prediction and prevention.

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## **MAINVIEW control area**

In the MAINVIEW window environment, first three lines at the top of the view containing the window information line and the COMMAND, SCROLL, CURR WIN, and ALT WIN lines. The control area cannot be customized and is part of the information display. *Contrast with* MAINVIEW display area, MAINVIEW window area.

**MAINVIEW Desktop** Version of the MAINVIEW window interface designed to run on OS/2 and Windows workstations.

## **MAINVIEW display area**

*See* MAINVIEW window area.

**MAINVIEW Explorer** Product that provides access to MAINVIEW products from a Web browser running under Windows. MAINVIEW Explorer replaces MAINVIEW Desktop.

**MAINVIEW for CICS** Product (formerly MV MANAGER for CICS) that provides real-time application performance analysis and monitoring for CICS system management.

**MAINVIEW for DB2** Product (formerly MV MANAGER for DB2) that provides real-time and historical application performance analysis and monitoring for DB2 subsystem management.

## **MAINVIEW for DBCTL (MVDBC)**

Product that provides real-time application performance analysis and monitoring for DBCTL management.

## **MAINVIEW for IMS (MVIMS) Offline**

Product with a Performance Reporter component that organizes data and prints reports used to analyze IMS performance and a Transaction Accountant component that produces cost accounting and user charge-back records and reports.

## **MAINVIEW for IMS (MVIMS) Online**

Product that provides real-time application performance analysis and monitoring for IMS management.

**MAINVIEW for IP** Product that monitors OS/390 and z/OS mission-critical application performance as it relates to TCP/IP stack usage. Collected data includes availability, connections, response times, routers, service levels, storage, traffic, Web cache, and so on.

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## **MAINVIEW for Linux–Servers**

Product that allows you to monitor the performance of your Linux systems from the MAINVIEW windows interface.

## **MAINVIEW for MQSeries**

*See MAINVIEW for WebSphere MQ.*

## **MAINVIEW for OS/390**

System management application (formerly known as MAINVIEW for MVS prior to version 2.5). Built upon the MAINVIEW window environment architecture, it uses the window interface to provide access to system performance data and other functions necessary in the overall management of an enterprise.

## **MAINVIEW for UNIX System Services**

System management application that allows you to monitor the performance of the Unix System Services from a MAINVIEW window interface.

## **MAINVIEW for VTAM**

Product that displays application performance data by application, transaction ID, and LU name. This collected data includes connections, response time statistics, application availability, and application throughput.

## **MAINVIEW for WebSphere Application Server (formerly known as MAINVIEW for WebSphere)**

Product that provides extensive monitoring for the IBM WebSphere Application Server for z/OS and OS/390 environment.

## **MAINVIEW for WebSphere MQ**

Delivers comprehensive capabilities for configuration, administration, performance monitoring and operations management for an entire MQM (message queue manager) network.

## **MAINVIEW for WebSphere MQ Integrator**

Licensed feature of MAINVIEW for WebSphere MQ that provides comprehensive configuration, administration, performance monitoring, and operations management capabilities for an IBM WebSphere MQ Integrator message broker network.

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## **MAINVIEW Selection Menu**

ISPF selection panel that provides access to all MAINVIEW windows-mode and full-screen mode products.

**MAINVIEW SRM**     *See* MAINVIEW Storage Resource Manager (SRM).

## **MAINVIEW SRM DMS2HSM**

Product that facilitates the conversion of CA-Disk, formerly known as DMS, to HSM.

## **MAINVIEW SRM EasyHSM**

Product that provides online monitoring and reporting to help storage managers use DFHSM efficiently.

## **MAINVIEW SRM EasyPOOL**

Product that provides control over data set allocation and enforcement of allocation and naming standards. EasyPOOL functions operate at the operating system level to intercept normal job processing, thus providing services without any JCL changes.

## **MAINVIEW SRM EasySMS**

Product that provides tools that aid in the conversion to DFSMS and provides enhancement to the DFSMS environment after implementation. EasySMS consists of the EasyACS functions, the SMSACSTE function, and the Monitoring and Positioning Facility.

## **MAINVIEW SRM Enterprise Storage Automation**

Product that delivers powerful event generation and storage automation technology across the storage enterprise. Used in conjunction with MAINVIEW AutoOPERATOR, automated solutions to perform pool, volume, application, or data set-level manipulation can be created and used in response to any condition or invoked to perform ad hoc requests.

## **MAINVIEW SRM SG-Auto**

Product that provides early warning notification of storage anomalies and automated responses to those anomalies based on conditions in the storage subsystem.

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## **MAINVIEW SRM SG-Control**

Product that provides real-time monitoring, budgeting, and control of DASD space utilization.

## **MAINVIEW SRM StopX37/II**

Product that provides enhancements to OS/390 or z/OS space management, reducing the incidence of space-related processing problems. The StopX37/II functions operate at the system level to intercept abend conditions or standards violations, thus providing services without any JCL changes.

## **MAINVIEW SRM StorageGUARD**

Product that monitors and reports on DASD consumption and provides historical views to help control current and future DASD usage.

## **MAINVIEW Storage Resource Manager (SRM)**

Suite of products that assist in all phases of OS/390 or z/OS storage management. MAINVIEW SRM consists of products that perform automation, reporting, trend analysis, and error correction for storage management.

## **MAINVIEW SYSPROG Services**

*See SYSPROG services.*

## **MAINVIEW VistaPoint**

Product that provides enterprise-wide views of performance. Application and workload views are available for CICS, DB2, DBCTL, IMS, OS/390, or z/OS. Data is summarized at the level of detail needed; for example, views can be for a single target, an OS/390 or z/OS image, or an entire enterprise.

## **MAINVIEW window area**

Portion of the information display that is not the control area and in which views are displayed and windows opened. It includes all but the first three lines of the information display. *Contrast with* MAINVIEW control area.

## **monitor**

Online service that measures resources or workloads at user-defined intervals and issues warnings when user-defined thresholds are exceeded.

---

## Multi-Level Automation (MLA)

The user-defined, multiple step process in Enterprise Storage Automation that implements solutions in a tiered approach, where solutions are invoked one after another until the condition is resolved.

|                 |                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>MVALARM</b>  | <i>See</i> MAINVIEW Alarm Manager.                                                                                                  |
| <b>MVAPI</b>    | <i>See</i> MAINVIEW Application Program Interface.                                                                                  |
| <b>MVCICS</b>   | <i>See</i> MAINVIEW for CICS.                                                                                                       |
| <b>MVDB2</b>    | <i>See</i> MAINVIEW for DB2.                                                                                                        |
| <b>MVDBC</b>    | <i>See</i> MAINVIEW for DBCTL.                                                                                                      |
| <b>MVIMS</b>    | <i>See</i> MAINVIEW for IMS.                                                                                                        |
| <b>MVIP</b>     | <i>See</i> MAINVIEW for IP.                                                                                                         |
| <b>MVLNX</b>    | <i>See</i> MAINVIEW for Linux–Servers.                                                                                              |
| <b>MVMQ</b>     | <i>See</i> MAINVIEW for WebSphere MQ or MAINVIEW for WebSphere MQ Integrator.                                                       |
| <b>MVMVS</b>    | <i>See</i> MAINVIEW for OS/390.                                                                                                     |
| <b>MVScope</b>  | MAINVIEW for OS/390 application that traces both CPU usage down to the CSECT level and I/O usage down to the channel program level. |
| <b>MVSRM</b>    | <i>See</i> MAINVIEW Storage Resource Manager (SRM).                                                                                 |
| <b>MVSRMHSM</b> | <i>See</i> MAINVIEW SRM EasyHSM.                                                                                                    |
| <b>MVSRMSGC</b> | <i>See</i> MAINVIEW SRM SG-Control.                                                                                                 |
| <b>MVSRMSGD</b> | <i>See</i> MAINVIEW SRM StorageGUARD.                                                                                               |
| <b>MVSRMSGP</b> | <i>See</i> MAINVIEW SRM StorageGUARD.                                                                                               |
| <b>MVUSS</b>    | <i>See</i> MAINVIEW for UNIX System Services.                                                                                       |
| <b>MVVP</b>     | <i>See</i> MAINVIEW VistaPoint.                                                                                                     |
| <b>MVVTAM</b>   | <i>See</i> MAINVIEW for VTAM.                                                                                                       |
| <b>MVWEB</b>    | <i>See</i> MAINVIEW for WebSphere Application Server.                                                                               |

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**nested help** Multiple layers of help pop-up windows. Each successive layer is accessed by clicking a hyperlink from the previous layer.

**object** Anything you can manipulate as a single unit. MAINVIEW objects can be any of the following: product, secondary window, view, row, column, or field.

You can issue an action against an object by issuing a line command in the line command column to the left of the object. *See* action.

**OMVS workload** Workload consisting of OS/390 OpenEdition address spaces.

**online help** Help information that is accessible online.

### **OS/390 and z/OS Installer**

BMC Software common installation system for mainframe products.

### **OS/390 product address space (PAS)**

Address space containing OS/390 or z/OS data collectors, including the CMF MONITOR Extractor. Used by MAINVIEW for OS/390, MAINVIEW for UNIX System Services, and CMF MONITOR products. *See* PAS.

**parameter library** Data set consisting of members that contain parameters for specific MAINVIEW products or a support component. There can be several versions:

- the distributed parameter library, called BBPARM
- a site-specific parameter library or libraries

These libraries can be

- created by AutoCustomization, called UBBPARM
- created manually, with a unique name

**PAS** Product address space. Used by the MAINVIEW products. Contains data collectors and other product functions. *See also* OS/390 product address space (PAS) *and* BBI subsystem product address space (BBI-SS PAS).

### **performance group workload**

Collection of address spaces defined to OS/390 or z/OS. If you are running OS/390 or z/OS with WLM in compatibility mode, MAINVIEW for OS/390 creates a performance group workload instead of a service class.

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## PERFORMANCE MANAGER

MAINVIEW for CICS online service for monitoring and managing current performance of CICS regions.

### Performance Reporter (MVIMS)

MVIMS Offline component that organizes data and prints reports that can be used to analyze IMS performance.

### Performance Reporter

Product component that generates offline batch reports. The following products can generate these reports:

- MAINVIEW for DB2
- MAINVIEW for CICS

### Plex Manager

Product through which cross-system communication, MAINVIEW security, and an SSI context are established and controlled. Plex Manager is shipped with MAINVIEW window environment products as part of the coordinating address space (CAS) and is accessible as a menu option from the MAINVIEW Selection Menu.

### pop-up display

Full-screen panel that displays additional information about a selected event in a detail trace.

### pop-up window

Window containing help information that, when active, overlays part of the window area. A pop-up window is displayed when you issue the HELP command while working in windows-mode.

### PRGP workload

In MVS/SP 5.0 or earlier, or in compatibility mode in MVS/SP 5.1 or later, composite of service classes. MAINVIEW for OS/390 creates a performance group workload for each performance group defined in the current IEAIPS.xx member.

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**procedure library** Data set consisting of members that contain executable procedures used by MAINVIEW AutoOPERATOR. These procedures are execute command lists (EXECs) that automate site functions. There can be several versions:

- the distributed parameter library, called BBPROC
- a site-specific parameter library or libraries

These can be

- a library created by AutoCustomization, called UBBPROC
- a library created manually, with a unique name

The site-created EXECs can be either user-written or customized MAINVIEW AutoOPERATOR-supplied EXECs from BBPROC.

**product address space**

*See* PAS.

**profile library** Data set consisting of members that contain profile information and cycle refresh definitions for a terminal session connected to a BBI-SS PAS. Other members are dynamically created by MAINVIEW applications. There can be several versions:

- the distributed profile library, called BBPROF
- a site-specific profile library or libraries

These can be

- a library created by AutoCustomization, called SBBPROF
- a library created manually, with a unique name

The site library is a common profile shared by all site users. The terminal session CLIST creates a user profile automatically if one does not exist; it is called `userid.BBPROF`, where `userid` is your logon ID. User profile libraries allow each user to specify unique PF keys, CYCLE commands, target system defaults, a Primary Option Menu, and a unique set of application profiles.

**query** One of two constituent parts of a view; the other is form. A query defines the data for a view; a form defines the display format. *See also* form, view.

**real-time data** Performance data as it exists at the moment of inquiry. Real-time data is recorded during the smallest unit of time for data collection. *Contrast with* historical data. *See also* current data and interval data.

**Resource Analyzer** Online real-time displays used to analyze IMS resources and determine which are affected by specific workload problems.

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|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Resource Monitor</b> | Online data collection services used to monitor IMS resources and issue warnings when defined utilization thresholds are exceeded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>row</b>              | (1) Horizontal component of a view or display comprising all the fields pertaining to a single device, address space, user, and so on. (2) Horizontal component of a DB2 table consisting of a sequence of values, one for each column of the table.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>RxD2</b>             | Product that provides access to DB2 from REXX. It provides tools to query the DB2 catalog, issue dynamic SQL, test DB2 applications, analyze EXPLAIN data, generate DDL or DB2 utility JCL, edit DB2 table spaces, perform security administration, and much more.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>sample cycle</b>     | Time between data samples.<br><br>For the CMF MONITOR Extractor, this is the time specified in the extractor control statements (usually 1 to 5 seconds).<br><br>For real-time data, the cycle is not fixed. Data is sampled each time you press <b>Enter</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>sample library</b>   | Data set consisting of members each of which contains one of the following items: <ul style="list-style-type: none"> <li>• sample JCL that can be edited to perform specific functions</li> <li>• macro that is referenced in the assembly of user-written services</li> <li>• sample user exit routine</li> </ul> <p>There can be several versions:</p> <ul style="list-style-type: none"> <li>• the distributed sample library, called BBSAMP</li> <li>• a site-specific sample library or libraries</li> </ul> <p>These can be</p> <ul style="list-style-type: none"> <li>• a library created by AutoCustomization, called UBBSAMP</li> <li>• a library created manually, with a unique name</li> </ul> |
| <b>sampler</b>          | Program that monitors a specific aspect of system performance. Includes utilization thresholds used by the Exception Monitor. The CMF MONITOR Extractor contains samplers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>SBBPROF</b>          | <i>See</i> profile library.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>scope</b>            | Subset of an SSI context. The scope could be all the data for the context or a subset of data within the context. It is user- or site-defined. <i>See</i> SSI context, target.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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**screen definition** Configuration of one or more views that have been stored with the SAVEScr command and assigned a unique name. A screen includes the layout of the windows and the view, context, system, and product active in each window.

**selection view** In MAINVIEW products, view displaying a list of available views.

**service class workload**

Collection of address spaces defined to OS/390 or z/OS. If you are running Workload Manager (WLM) in goal mode, MAINVIEW for OS/390 creates a service class workload for each service class that you define through WLM definition dialogs.

If you are running MVS 4.3 or earlier, or MVS/SP 5.1 or later with WLM in compatibility mode, OS/390 creates a performance group workload instead of a service class. *See* performance group workload.

**service objective** Workload performance goal, specified in terms of response time for TSO workloads or turnaround time for batch workloads. Performance group workloads can be measured by either objective. Composite workload service objectives consist of user-defined weighting factors assigned to each constituent workload. For compatibility mode, neither OS/390 nor z/OS provides any way to measure service.

**service point** Specification, to MAINVIEW, of the services required to enable a specific product. Services can be actions, selectors, or views. Each target (for example, CICS, DB2, or IMS) has its own service point.

The PLEX view lists all the defined service points known to the CAS to which the terminal session is connected.

**service request block (SRB)**

Control block that represents a routine to be dispatched. SRB mode routines generally perform work for the operating system at a high priority. An SRB is similar to a task control block (TCB) in that it identifies a unit of work to the system. *See also* task control block.

**service select code** Code entered to invoke analyzers, monitors, and general services. This code is also the name of the individual service.

**session** Total period of time an address space has been active. A session begins when monitoring can be performed. If the product address space (PAS) starts after the job, the session starts with the PAS.

**SG-Auto** *See* MAINVIEW SRM SG-Auto.

**SG-Control** *See* MAINVIEW SRM SG-Control.

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## single system image (SSI)

Feature of the MAINVIEW window environment architecture where you can view and perform actions on multiple OS/390 or z/OS systems as though they were a single system. The rows of a single tabular view can contain rows from different OS/390 or z/OS images.

## Skeleton Tailoring Facility

A facility in MAINVIEW AutoOPERATOR that allows skeleton JCL to be used during job submission. Skeleton JCL can contain variables within the JCL statements to be substituted with data values at job submission time. Directive statements can be used in the skeleton JCL to cause the repetition of a set of skeleton statements. This facility functions similar to the TSO skeleton tailoring facility.

**SRB** *See* service request block.

**SSI** *See* single system image.

**SSI context** Name created to represent one or more targets for a given product. *See* context, target.

## started task workload

Address spaces running jobs that were initiated programmatically.

**statistics interval** For MAINVIEW for DB2, cumulative count within a predefined interval (30-minute default set by the DB2STATS parameter in the distributed BBPARM member BBIISP00) for an analyzer service DELTA or RATE display. Specifying the DELTA parameter displays the current value as the difference between the value sampled by the current analyzer request and the value sampled at the start of the current interval. Specifying the RATE parameter displays the current value by minute (DELTA divided by the number of elapsed minutes).

**stem variables** A REXX facility, supported in MAINVIEW AutoOPERATOR REXX EXECs and the Skeleton Tailoring Facility, where variable names end with a period followed by a number, such as &POOL.1. This configuration allows each variable to actually represent a table or array of data, with the zero variable containing the number of entries in the array. For example, &POOL.0 = 5 would indicate variables &POOL.1 through &POOL.5 exist.

**StopX37/II** *See* MAINVIEW SRM StopX37/II.

**StorageGUARD** *See* MAINVIEW SRM StorageGUARD.

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|                                 |                                                                                                                                                                                                                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>summary view</b>             | View created from a tabular view using the Summarize option in view customization. A summary view compresses several rows of data into a single row based on the summarize criteria.                                                                                                              |
| <b>SYSPROG services</b>         | Component of MAINVIEW for OS/390. Over 100 services that detect, diagnose, and correct OS/390 or z/OS system problems as they occur. Accessible from the OS/390 Performance and Control Main Menu. Note that this component is also available as a stand-alone product MAINVIEW SYSPROG Services. |
| <b>system resource</b>          | <i>See</i> object.                                                                                                                                                                                                                                                                                |
| <b>target</b>                   | Entity monitored by one or more MAINVIEW products, such as an OS/390 or z/OS image, an IMS or DB2 subsystem, a CICS region, or related workloads across systems. <i>See</i> context, scope, SSI context.                                                                                          |
| <b>target context</b>           | Single target/product combination. <i>See</i> context.                                                                                                                                                                                                                                            |
| <b>TASCOSTR</b>                 | MAINVIEW for IMS Offline program that summarizes detail and summary IMS Resource Utilization Files (IRUFs) to be used as input to the offline components.                                                                                                                                         |
| <b>task control block (TCB)</b> | Address space-specific control block that represents a unit of work that is dispatched in the address space in which it was created. <i>See also</i> service request block.                                                                                                                       |
| <b>TCB</b>                      | <i>See</i> task control block.                                                                                                                                                                                                                                                                    |
| <b>terminal session (TS)</b>    | Single point of control for MAINVIEW products, allowing data manipulation and data display and providing other terminal user services for MAINVIEW products. The terminal session runs in a user address space (either a TSO address space or a stand-alone address space for EXCP/VTAM access).  |
| <b>TDIR</b>                     | <i>See</i> trace log directory.                                                                                                                                                                                                                                                                   |
| <b>threshold</b>                | Specified value used to determine whether the data in a field meets specific criteria.                                                                                                                                                                                                            |
| <b>TLDS</b>                     | <i>See</i> trace log data set.                                                                                                                                                                                                                                                                    |
| <b>total mode</b>               | Usage mode in CMFMON wherein certain columns of data reflect the cumulative value between collection intervals. Invoked by the DELta OFF command. <i>See also</i> collection interval, delta mode.                                                                                                |

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**trace** (1) Record of a series of events chronologically listed as they occur. (2) Online data collection and display services that track transaction activity through DB2, IMS, or CICS.

**trace log data set (TLDS)**

Single or multiple external VSAM data sets containing summary or detail trace data for later viewing or printing. The trace log(s) can be defined as needed or dynamically allocated by the BBI-SS PAS. Each trace request is assigned its own trace log data set(s).

**trace log directory (TDIR)**

VSAM linear data set containing one entry for each trace log data set. Each entry indicates the date and time of data set creation, the current status of the data set, the trace target, and other related information.

**transaction** Specific set of input data that initiates a predefined process or job.

**Transaction Accountant**

MVIMS Offline component that produces cost accounting and user charge-back records and reports.

**TS** *See* terminal session.

**TSO workload** Workload that consists of address spaces running TSO sessions.

**UAS** *See* user address space.

**UBBPARM** *See* parameter library.

**UBBPROC** *See* procedure library.

**UBBSAMP** *See* sample library.

**user address space**

Runs a MAINVIEW terminal session (TS) in TSO, VTAM, or EXCP mode.

**User BBPROF** *See* profile library.

**view** Formatted data within a MAINVIEW window, acquired from a product as a result of a view command or action. A view consists of two parts: query and form. *See also* form, job activity view, query.

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|                                |                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>view definition</b>         | Meaning of data that appears online, including source of data, selection criteria for data field inclusion and placement, data format, summarization, context, product, view name, hyperlink fields, and threshold conditions.                                                                                                                                                  |
| <b>view command</b>            | Name of a view that you type on the COMMAND line to display that view.                                                                                                                                                                                                                                                                                                          |
| <b>view command stack</b>      | Internal stack of up to 10 queries. For each command, the stack contains the filter parameters, sort order, context, product, and time frame that accompany the view.                                                                                                                                                                                                           |
| <b>view help</b>               | Online help describing the purpose of a view. To display view help, place the cursor on the view name on the window information line and press <b>PF1</b> (HELP).                                                                                                                                                                                                               |
| <b>window</b>                  | Area of the MAINVIEW screen in which views and resources are presented. A window has visible boundaries and can be smaller than or equal in size to the MAINVIEW window area. <i>See</i> active window, alternate window, current window, MAINVIEW window area.                                                                                                                 |
| <b>window information line</b> | Top border of a window. Shows the window identifier, the name of the view displayed in the window, the system, the scope, the product reflected by the window, and the tomfooleries for which the data in the window is relevant. <i>See also</i> window status field.                                                                                                          |
| <b>window number</b>           | Sequential number assigned by MAINVIEW to each window when it is opened. The window number is the second character in the window status field. <i>See also</i> window status field.                                                                                                                                                                                             |
| <b>window status</b>           | One-character letter in the window status field that indicates when a window is ready to receive commands, is busy processing commands, is not to be updated, or contains no data. It also indicates when an error has occurred in a window. The window status is the first character in the window status field. <i>See also</i> window information line, window status field. |
| <b>window status field</b>     | Field on the window information line that shows the current status and assigned number of the window. <i>See also</i> window number, window status.                                                                                                                                                                                                                             |
| <b>windows mode</b>            | Display of one or more MAINVIEW product views on a screen that can be divided into a maximum of 20 windows. A window information line defines the top border of each window. <i>Contrast with</i> full-screen mode.                                                                                                                                                             |
| <b>WLM workload</b>            | In goal mode in MVS/SP 5.1 and later, a composite of service classes. MAINVIEW for OS/390 creates a workload for each WLM workload defined in the active service policy.                                                                                                                                                                                                        |

---

**workflow** Measure of system activity that indicates how efficiently system resources are serving the jobs in a workload.

**workload** (1) Systematic grouping of units of work (for example, address spaces, CICS transactions, IMS transactions) according to classification criteria established by a system administrator. (2) In OS/390 or z/OS, a group of service classes within a service definition.

**workload activity view**

Tracks workload activity as the workload accesses system resources. A workload activity view measures workload activity in terms of resource consumption and how well the workload activity meets its service objectives.

**Workload Analyzer** Online data collection and display services used to analyze IMS workloads and determine problem causes.

**workload definition** Workload created through the WKLIST view. Contains a unique name, a description, an initial status, a current status, and selection criteria by which address spaces are selected for inclusion in the workload. *See* Workload Definition Facility.

**Workload Definition Facility**

In MAINVIEW for OS/390, WKLIST view and its associated dialogs through which workloads are defined and service objectives set.

**workload delay view**

Tracks workload performance as the workload accesses system resources. A workload delay view measures any delay a workload experiences as it contends for those resources.

**Workload Monitor** Online data collection services used to monitor IMS workloads and issue warnings when defined thresholds are exceeded.

**workload objectives**

Performance goals for a workload, defined in WKLIST. Objectives can include measures of performance such as response times and batch turnaround times.

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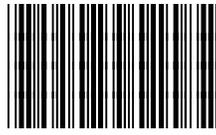
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