IBM
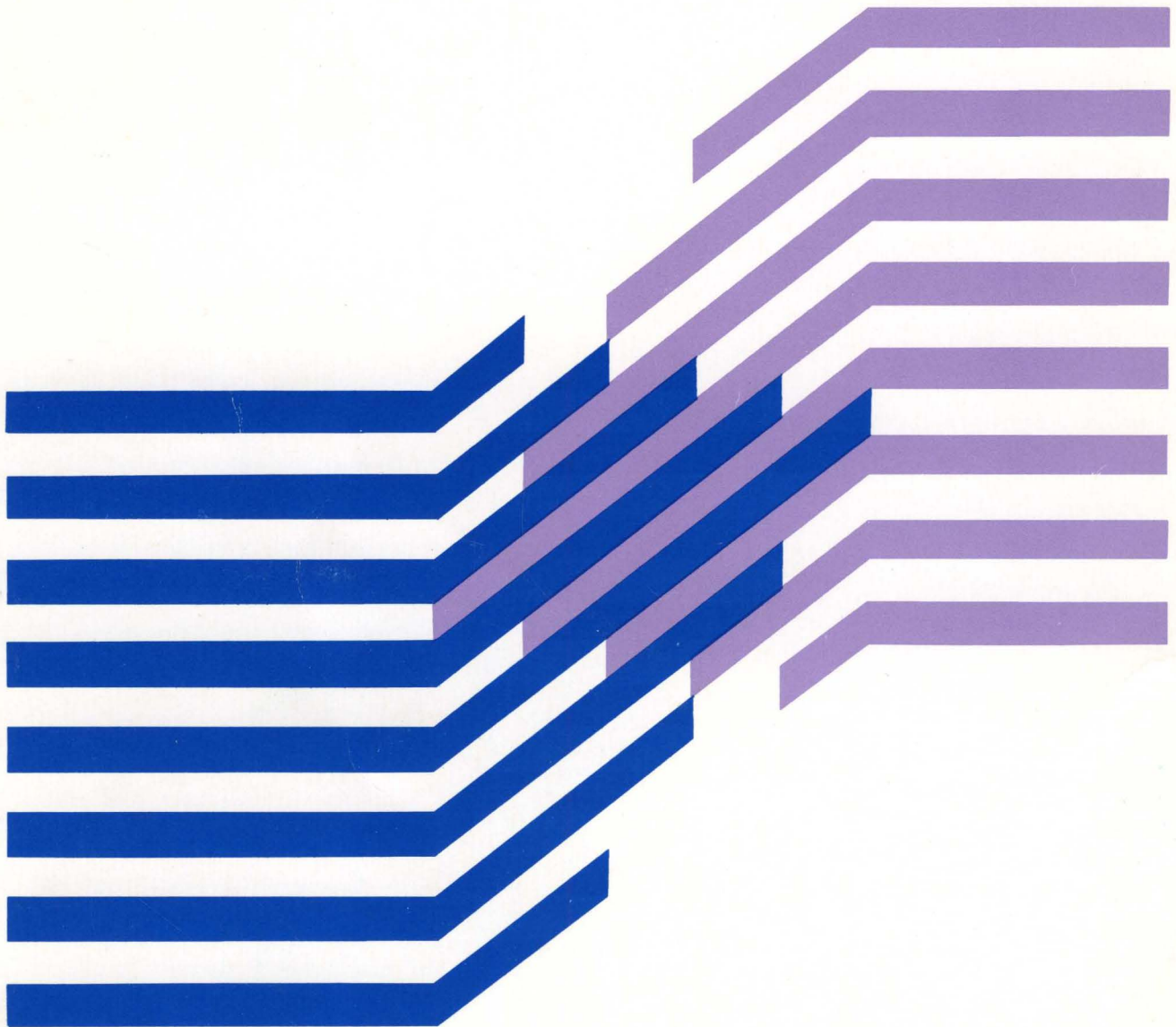
MVS/ESA Conversion Notebook
for System Production Version 3 Volume 2

MVS/System Product:
JES2 Version 3
JES3 Version 3

IBM

MVS/ESA Conversion Notebook
for System Production Version 3 Volume 2

MVS/System Product:
JES2 Version 3
JES3 Version 3

Changes for Version 3

This book contains the same kind of information previously presented in *MVS/Extended Architecture Conversion Notebook, Volume 1 and 2*, (GC28-1143 and GC28-1411). The following summarizes the updates to the system.

Information That Is New

Functional Updates

- PRDMP is eliminated. IPCS now performs the PRDMP functions.

- Virtual lookaside facility (VLF) is a new component.

- Access registers, data spaces and linkage stacks provide new functional capabilities.

- Support for Storage Management Subsystem in DFP 3.1 is added.

- There are data-in-virtual improvements.

- There are new and updated control blocks.

New Commands

- DISPLAY SMS
- DISPLAY UNITS
- IPCS commands
- PAGEDEL
- SETIOS
- SETSMS

New Macros

- ALESERV
- ASCRE
- ASDES
- ASEXT
- ATTACHX
- BLSRDRPX
- BLSRPRD
- COFDEFIN
- COFIDENT
- COFCREAT
- COFNOTIF
- COFPURGE
- COFREMOV
- COFRETRI
- CTRACE
- DETACHX
- DSPSERV
- ESTAEX
- ETDEF
- ITTFMTB
- LINKX
- LSEXPAND

- RESMGR
- SDUMPX
- SNAPX
- STORAGE
- SYNCHX
- SYSSTATE
- TCBTOKEN
- TESTART
- UCBDEVN
- XCTLX

New User Exits

- CSVLLIX1
- CSVLLIX2
- IEFDOIXT

New System Libraries and Their Members

- COFVLFxx member of SYS1.PARMLIB
- CSVLLAxx member of SYS1.PARMLIB
- EXSPATxx member of SYS1.PARMLIB
- IGDSMSxx member of SYS1.PARMLIB
- SYS1.MIGLIB

Information That Is Updated
Functional Updates

- There are enhancements to the LNKLIST lookaside facility (LLA).
- There are enhancements to the data-in-virtual component.
- There are updated control blocks.

Updated Commands

- CHNGDUMP
- DEVSERV
- DISPLAY
- DUMP
- IPCS commands
- MODIFY LLA
- MSGRT
- PAGEADD
- REPLY
- SET
- SLIP
- TRACE
- VARY
- VARY ONLINE
- VARY SMS

Updated Macros

- ABEND
- AMDSADMP/AMDSADM2
- ATTACH

- BLSABDPL
- BLSQMDEF
- BLSQMFLD
- BLSRESSY
- CALL
- CALLRTM
- CPOOL
- DETACH
- DIV
- DYNALLOC
- ESTAE
- FESTAE
- FREEMAIN
- GETMAIN
- LINK
- LOCASCB
- MGCR
- OUTADD
- OUTDEL
- PGSER
- POST
- SDUMP
- SETFRR
- SETLOCK
- SETRP
- SNAP
- SPLEVEL
- SVCUPDTE
- SYMREC
- SYNCH
- VRADATA
- VSMLIST
- VSMLOC
- WAIT
- XCTL

Updated User Exits

- IEFEB400
- IEFUSI
- BLSUGWDM

Updated System Libraries and Their Members

- BLSCECTx member of SYS1.PARMLIB
- IEAIPSxx member of SYS1.PARMLIB
- IEASVCxx member of SYS1.PARMLIB
- IEASYSxx member of SYS1.PARMLIB
- IECIOSxx member of SYS1.PARMLIB
- IEFSSNxx member of SYS1.PARMLIB
- GTFPARM member of SYS1.PARMLIB
- MPFLSTxx member of SYS1.PARMLIB
- VATLSTxx member of SYS1.PARMLIB

About This Book

This book, *MVS/ESA™ Conversion Notebook, Volume 2*, describes conversion differences between MVS/SP™ Version 2 Release 2.0 and MVS/SP Version 3. No information in this book should be construed as defining programming interfaces.

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* MVS/DFP™
* MVS/ESA™
* MVS/SP™
* MVS/XA™

Who This Book Is For

This book is intended for experienced system programmers responsible for converting to MVS/SP Version 3 Release 1. You should have an in-depth knowledge of MVS/SP Version 2 and MVS/SP Version 3 Release 1, the configuration and procedures of your current installation, and the configuration of your target installation.

How To Use This Book

Readers are expected to be familiar with the contents of the *MVS/Enterprise Systems Architecture Conversion Notebook, Volume 1*, which contains conversion information related to all levels of MVS/SP Version 2. Reading overview information in the Licensed Programming Announcement letters and General Information Manuals for MVS/SP Version 3 Release 1 and MVS/XA™ DFP Version 2 Release 3 or MVS/ESA Version 3 Release 1 is also helpful.

Base Control Program (BCP) Updates

An MVS/ESA system always includes a level of the MVS Data Facility Product (MVS/DFP™) and a level of one of the job entry subsystems, JES2 or JES3 as well as a level of the BCP (also known as MVS/SP). New levels of each of these products become available independently of the others. When there is a new MVS/DFP level there is not always a new level of the BCP. When there is a new level of JES2 or JES3, however, there usually is a new level of the BCP. The new level of the BCP may only differ in name, not in technical updates, from the previous one.

Naming Conventions

MVS/ESA refers to the combination of MVS/SP Version 3 and MVS/DFP Version 3. Frequently, this book refers to different releases of MVS/SP Version 3, and MVS/DFP by the MVS/SP Version/release/level number. Release 3.1 refers to MVS/SP Version 3 Release 1 and either MVS/XA DFP Version 2 Release 3 or MVS/DFP Version 3 Release 1.

Additionally, this book uses the term MVS/ESA interchangeably with MVS/SP Version 3. It uses the term MVS/XA to refer to MVS/SP Version 2 and the term MVS/370 to refer to OS/VS2 MVS Release 3.8 or any level of MVS/SP Version 1. In discussions that pertain to all levels of a release, the book uses an x in place of a level number. Thus, Release 2.1.x refers to any level of MVS/SP Version 2 Release 1; for example, Release 2.1.3 or Release 2.1.7.

How This Book Is Organized

The information in this book is organized as follows:

"Chapter 1: Positioning and Planning" summarizes the PTFs required for Release 3.1. It lists conversion tasks you can do on your system before receiving Release 3.1 and describes changes in MVS for Release 3.1.

"Chapter 2: System Generation, Customization, and IPL" includes information related to generating the Release 3.1 system, defining the I/O configuration, and initializing system parameters.

"Chapter 3: Programming Considerations" describes changes that might affect user-written code, including changes to macros and control blocks. It also describes new and updated programming functions available to programmers.

"Chapter 4: Operating Considerations" describes new and changed commands and operational procedures.

"Chapter 5: System Modifications" describes new and changed user exits and ways of tailoring the system.

"Chapter 6: Problem Diagnosis" describes new and changed ways of recording program errors and using the interactive problem control system (IPCS).

"Chapter 7: Accounting" describes changes that might affect your accounting procedures.

"Chapter 8: Measurement and Tuning" describes changes related to performance.

"Chapter 9: Coexistence Considerations" contains considerations for running different releases of MVS in a single installation.

The *MVS/ESA Conversion Notebook, Volume 1* and *MVS/ESA Conversion Notebook, Volume 2* do **not** describe:

- How to install the program products. The *Program Directory* shipped with the product describes the installation procedure.

- JES conversion information other than the explanations of which JES releases run with each level of MVS/SP Version 3 Release 1. See "The JES2 Component of MVS/ESA" on page 1-4 and "The JES3 Component of MVS/ESA" on page 1-5.

  JES2 conversion information is available in:

  - *MVS/XA SPL: JES2 User Modifications and Macros*, LC23-0069
  - *SPL: JES2 User Modifications and Macros*, LC23-0067
  - *JES2 Program Directory*

JES3 conversion information is available in:

- *MVS/XA JES3 Conversion Notebook*, SC28-1412
- *JES3 Program Directory*

- Storage management subsystem conversion information. The storage management subsystem can be installed and made active only if MVS/DFP Version 3 Release 1 or a later MVS/DFP release is installed and active on your MVS/SP Version 3 Release 1 system. When it becomes available, see the MVS/DFP library for more information about the Storage Management Subsystem.

- How to write programs that execute in 31-bit addressing mode. *MVS/ESA SPL: Application Development — 31-Bit Addressing* contains that information. This *Conversion Notebook* does, however, describe system changes that take advantage of, or support, 31-bit addressing and the impact the changes have on user-written programs. For example, the *Conversion Notebook* lists control blocks that have been moved to the extended area of virtual storage.

- How to write programs that execute in access register mode. See *MVS/ESA SPL: Application Development--Extended Addressability Guide* for information executing programs in access register mode.

Related Information

The *MVS/ESA Conversion Notebook, Volume 2* highlights differences in MVS/ESA to help you identify changes you need to make to existing procedures, programs, and system modifications. You will, however, need other books in the MVS/ESA library to make any required changes to your procedures and programs. The following table lists all the books referred to in the *MVS/ESA Conversion Notebook, Volume 2*. The table shows the topic of the book, the full title, and the order number of the book. For a complete list of the publications that support MVS, see the general information manuals.

Related Books for Release 3.1

Topic	Title	Order Number
BCP library	*MVS/ESA Library Guide*	GC28-1821
BCP programming interfaces	*MVS/SP Version 3 Directory of Programming Interfaces for Customers*	GC28-1847
commands	*MVS/ESA Operations: System Commands*	GC28-1826
control blocks.	*MVS/ESA Data Areas Volumes 1 - 5*	LY28-1043 - 1047
conversion Release 2.1.x and 2.2	*MVS/ESA Conversion Notebook for SP Version 3 Volume 1*	GC28-1567
conversion JES3 Release 2.2.1	*MVS/XA JES3 Conversion Notebook*	SC28-1412
DADSM	*MVS/XA DADSM Diagnosis Reference*	LY26-3961
data management	*MVS/XA Data Administration: Macro Instruction Reference*	GC26-4141
data management	*MVS/XA System - Data Administration*	GC26-4149
DFP Planning	*MVS/XA Data Facility Product Version 2 Planning Guide and Index*	GC26-4147
logic	*MVS/ESA Component Diagnosis and Logic: Master Table of Contents*	GC28-1839
EREP	*Environmental Record Editing and Printing Program User's Guide and Reference*	GC28-1378
Extended addressability	*MVS/ESA System Programming Library: Application Development — Extended Addressability*	GC28-1854
GIM for the BCP	*MVS/ESA General Information Manual for System Product Version 3*	GC28-1359
GIM for DFP	*MVS/Extended Architecture Data Facility Product Version 2 General Information*	GC26-4142
ICF	*MVS/XA Integrated Catalog Administration: Access Method Services Reference*	GC26-4135
initialization and tuning	*MVS/ESA System Programming Library: Initialization and Tuning*	GC28-1828

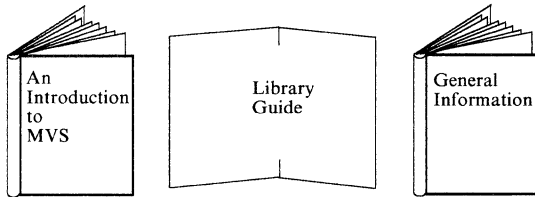| Topic	Title	Order Number
IPCS	*MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization*	GC28-1833
IPCS	*MVS/ESA Interactive Problem Control System (IPCS) User's Guide*	GC28-1834
IPCS	*MVS/ESA Interactive Problem Control System (IPCS) Command Reference*	GC28-1835
IPCS	*MVS/ESA Interactive Problem Control System (IPCS) Logic and Diagnosis*	LY28-1836
JES2	*System Programming Library: JES2 User Modification and Macros*	LY28-1010
JES3	*System Programming Library: JES3 User Modification and Macros*	LY28-1013
JCL	*MVS/ESA JCL Reference*	GC28-1829
JCL	*MVS/ESA JCL User's Guide*	GC28-1830
macros, application programming	*MVS/ESA Application Development Guide*	GC28-1821
macros, application programming	*MVS/ESA Application Development Reference*	GC28-1822
macros, system programming	*MVS/ESA System Programming Library: Application Development Guide*	GC28-1852
macros, system programming	*MVS/ESA System Programming Library: Application Development Macro Reference*	GC28-1857
macros, system programming	*MVS/ESA System Programming Library: Application Development — Extended Addressability*	GC28-1854
macros, system programming	*MVS/ESA System Programming Library: Application Development 31-Bit Addressing*	GC28-1820
messages, dump output	*MVS/ESA Message Library: Dump Output Messages*	GC28-1814
messages, system	*MVS/ESA Message Library: System Messages Volumes 1 and 2*	GC28-1812 GC28-1813
MVSCP	*MVS/ESA MVS Configuration Program Guide and Reference*	GC28-1817
MVSCP	*MVS/ESA Component Diagnosis: MVS Configuration Program*	LY28-1852
MVS Introduction	*An Introduction to MVS*	GC28-1823
RACF	*Resource Access Control Facility (RACF) General Information*	GC28-0722
RACF	*Resource Access Control Facility (RACF) Command Language Reference*	SC28-0733
RMF	*MVS/ESA Resource Measurement Facility Version 4 General Information*	GC28-1028

Topic	Title	Order Number
RMF	*MVS/ESA Resource Measurement Facility Version 4 Monitor I and Monitor II Reference and User's Guide*	LY28-1007
RMF	*MVS/ESA Resource Measurement Facility Version 4 Monitor III Reference and User's Guide*	LY28-1008
service aids	*MVS/ESA Service Aids*	GC28-1844
SMF	*MVS/ESA System Programming Library: System Management Facilities*	GC28-1819
SMP/E	*System Modification Program Extended (SMP/E) User's Guide*	SC28-1302
symptom records	*MVS/ESA SYS1.LOGREC Error Recording*	GC28-1845
system modifications	*MVS/ESA System Programming Library: System Modifications*	GC28-1831
system generation	*MVS/ESA System Generation*	GC26-1825
tape	*MVS/ESA Magnetic Tape Labels and File Structure Administration*	GC26-4145
TSO/E	*TSO Extensions (TSO/E) General Information*	GC28-1061
user exits	*MVS/ESA System Programming Library: User Exits*	GC28-1836
utilities	*MVS/XA Data Administration: Utilities*	GC26-4150
VSAM	*MVS/ESA VSAM Administration Guide*	GC26-4151
VSAM	*MVS/ESA VSAM Administration: Macro Instruction Reference*	GC26-4152
31-bit	*MVS/ESA System Programming Library: Application Development 31-Bit Addressing*	GC28-1820

The MVS/SP Version 3 Library

Publications are separated into the basic tasks required for MVS/SP Version 3. The primary publications for each task are listed on the left. Secondary publications that provide additional information about the task are listed on the right.
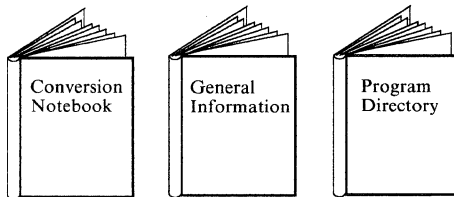
Evaluation

An Introduction to MVS	Library Guide	General Information

Planning

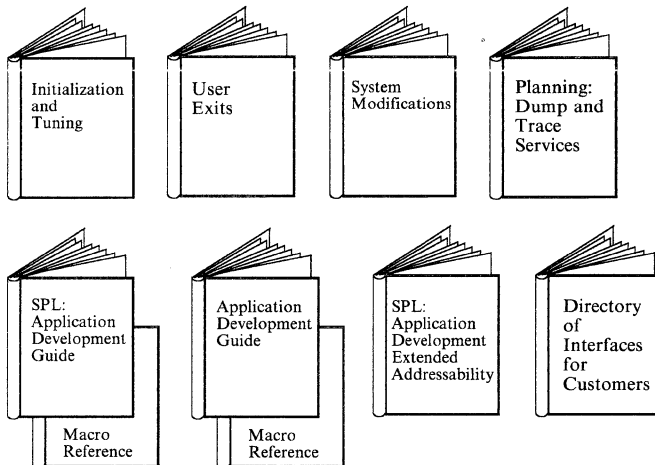| Conversion Notebook	General Information	Program Directory

Also:

MVS/ESA Initialization and Tuning
MVS/ESA Recovery and Reconfiguration
MVS/ESA MVS Configuration Program
MVS/ESA Global Resource Serialization
MVS/ESA System Management Facilities (SMF)
MVS/ESA SPL: Application Development Guide

System Tailoring

Initialization and Tuning	User Exits	System Modifications	Planning: Dump and Trace Services

SPL: Application Development Guide	Application Development Guide	SPL: Application Development Extended Addressability	Directory of Interfaces for Customers
Macro Reference	Macro Reference		

Also:

MVS/ESA Service Aids
MVS/ESA MVS Configuration Program
MVS/ESA Component Diagnosis Library
MVS/ESA Diagnosis: Data Areas
MVS/ESA Data Areas Microfiche
MVS/ESA System Modifications

Programming

JCL User's Guide	JCL Reference	SPL: Application Development Guide	Application Development Guide
		Macro Reference	Macro Reference
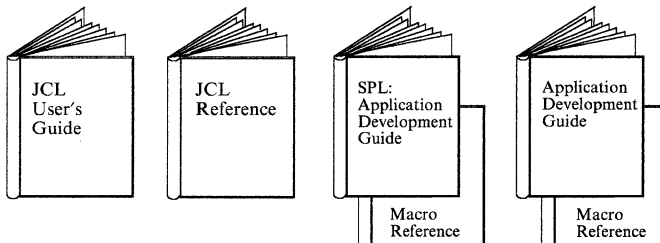
Also:

MVS/ESA SPL: Application Development 31-Bit Addressing Guide
MVS/ESA SPL: Application Development Extended Addressability
MVS/ESA TSO Programming
MVS/ESA Diagnosis: Data Areas
MVS/ESA Component Diagnosis Library
MVS/ESA Data Areas Microfiche

Operations

System Commands	System Messages Volume 1 / Volume 2	Routing and Descriptor Codes	System Codes	

Also:

MVS/ESA Initialization and Tuning
MVS/ESA Recovery and Reconfiguration
MVS/ESA Application Development Guide
MVS/ESA Application Development Reference

Maintenance

OLTEP

Also:

MVS/ESA Diagnosis: Data Areas
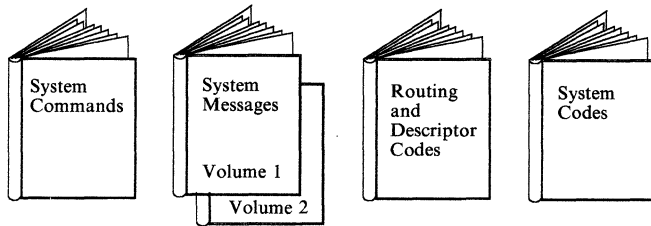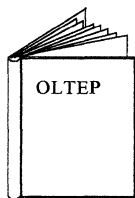MVS/ESA MVS Component Diagnosis Library
MVS/ESA Data Areas Microfiche

Accounting

SPL: System Management Facilities

Diagnosis

Diagnosis: Basics of Problem Determination	Diagnosis: Special Analysis Technique	Service Aids	Diagnosis: Using Dumps and Traces
System Messages Volume 1 / Volume 2	Dump Output Messages	Routing and Descriptor Codes	System Codes
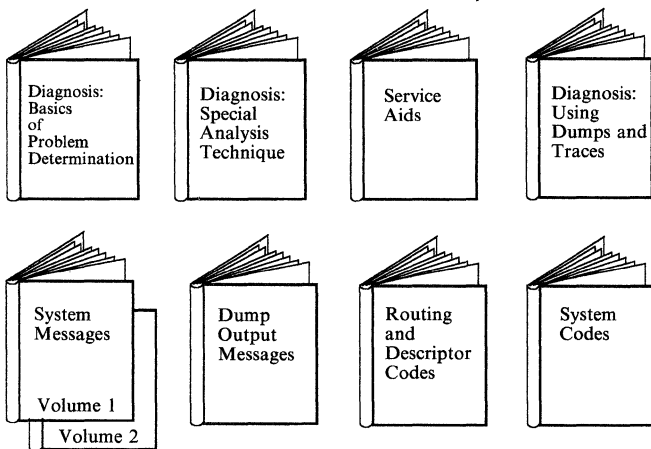
Also:

EREP
MVS/ESA System Commands
MVS/ESA SYS1.LOGREC Error Recording
MVS/ESA SPL: Application Development Guide
MVS/ESA SPL: Application Development Reference
MVS/ESA Application Development Guide
MVS/ESA Application Development Reference
MVS/ESA System Modifications
MVS/ESA User Exits
MVS/ESA OLTEP
MVS/ESA Diagnosis: Data Areas
MVS/ESA Diagnosis: System Reference
MVS/ESA Component Diagnosis Library
MVS/ESA Data Areas Microfiche
MVS/ESA IPCS Library

Contents

Figures

Chapter 1. Positioning and Planning

Before installing Release 3.1 you must determine what updates are needed for IBM-supplied products, what changes need to be made to system libraries, what changes need to be made to non-IBM products, and whether or not this release supports the peripheral devices you plan to use.

The time required for pre-installation activities depends on such things as whether you have a separate test system available, and what products and devices you plan to use in the Release 3.1 system.

Be sure you include the following steps when planning your pre-installation activities:

1. Obtain and install any required compatibility PTFs for, or updated versions of, the program products you are running.

   Have your IBM representative check the RETAIN preventive service planning (PSP) bucket for each product. This will provide the most current information on PTFs or versions needed to ensure compatibility with Release 3.1. Have RETAIN checked again just before testing the product under your new level of Release 3.1. The *Program Directory* that is shipped with each release also lists required PTFs. In addition, your IBM representative can give you up-to-date information on when the required PTFs will be available and how to obtain them.

2. Contact programmers responsible for updating non-IBM programs.

   Verify that the programs purchased from non-IBM vendors will continue to run and make changes to your own programs to ensure compatibility with the new release.

3. If you are currently using any devices or features not supported in Release 3.1, either make plans to migrate to the successor product or function or write unit information modules (UIMs). Release 3.1 requires an IBM processor that supports the IBM Enterprise System Architecture/370™.

4. Build the Release 3.1 system.

5. Test your modified system.

Conversion From Other MVS Operating Systems

It is possible to convert to Release 3.1 from levels of MVS/XA previous to Release 2.2.

- If you are currently running on a Release 2.1.7 level of MVS, you need to be aware of the changes that have occurred in MVS/XA through Release 2.2. (Read part 2 of the *MVS/ESA Conversion Notebook, Volume 1*).

- If you are currently running on a pre-Release 2.1.7 level of MVS/XA, you need to be aware of the changes that have occurred in MVS/XA through Release 2.1.7 and 2.2. (Read the sections of part 1 and 2 of the *MVS/ESA Conversion Notebook, Volume 1* that are new to you.)

Then, for Release 3.1 information read *MVS/ESA Conversion Notebook, Volume 2.* Your installation procedures are the same as for 2.2 users. They are briefly described

in Chapter 2 but are given in detail in the *Program Directory* shipped with the release.

If you are currently running an MVS/370 system, you need to be aware of the evolution of MVS/XA. (Read all of the *MVS/ESA Conversion Notebook, Volume 1*). Then, read this book, *MVS/ESA Conversion Notebook, Volume 2*.

Changes to IBM Program Products for Release 3.1

If you intend to make use of all of the updates and new functions included in a new release, you can think of the installation process as having three phases:

1. Activities you can do before installing the release.
2. Activities you can only do at installation time.
3. Activities you can postpone until after installing the release.

In each phase there is a need to install products or PTFs. Figure 1-1 summarizes these product-positioning requirements for Release 3.1. Contact your IBM representative for up-to-date information on when the required PTFs are available and how to obtain them.

IBM Program Products and Release 3.1

Figure 1-1. Related and Required Products for Installation Running Release 3.1			
	MUST DO BEFORE BCP INSTALLATION	**MUST DO SIMULTANEOUSLY WITH BCP INSTALLATION**	**CAN DO AFTER BCP INSTALLATION**
REQUIRED FOR ALL INSTALLATIONS	Assembler H Version 2 (5668-962) (PTF) BTAM (PTF) TIOC (PTF) SMP/E4 TSO (base) (HTO1310) or TSO/E 1.4 (product) (See notes 1 and 5 below)	MVS/XA DFP 2.3 (PTF)	EREP 3.3 (See note 4 below) MVS/DFP 3.1 - to activate the subsystem management service (See notes 2 and 3 below)
REQUIRED FOR INSTALLATIONS RUNNING THESE PRODUCTS	ICKDSF 1.9 (PTF) RACF 1.8 SDSF 1.0 (PTF)		JES2 2.2.0 (product) JES3 2.2.1 (SPE) JMF II MICR/OCR (feature) RMF 4.1

This table contains product updates for Release 3.1. See *MVS/ESA Conversion Notebook, Volume 1* for tables listing other related and required products whose requirements did not change for 3.1.

Notes:

1. During BCP installation, Assembler H Version 2 and SMP/E 4 must be installed on the driving system. BTAM and TIOC must be installed on the receiving system.

2. If you are installing both MVS/DFP Release 3.1 and MVS Release 3.1, you must either install MVS/DFP Release 3.1 simultaneously with the BCP or install the BCP with a previous level of MVS/DFP and then install MVS/DFP Release 3.1.

3. If you are installing MVS/DFP 3.1, see the *Program Directory* for MVS/DFP 3.1 for the other products that must be installed.

4. EREP may also be installed simultaneously with the BCP to provide better error reports during the installation process.

5. Base TSO or the product TSO must be installed before or simultaneously with the BCP. Whichever TSO is used, it must be accepted prior to stage 1 processing in the installation process.

As Figure 1-1 indicates, the BTAM, TIOC, SMP/E 4, EREP and MVS/DFP products are mandatory for all installations. The other products optional.

The JES2 Component of MVS/ESA

Figure 1-2 shows which JES2 releases operate with the Version 3 Release 1 base control program (BCP).

If your target BCP supports your current JES2 subsystem, you need not reinstall JES2 at the time you install the new BCP. However, it is recommended that you keep up with new versions of JES2 as soon as is convenient. The *Program Directory* shipped with each MVS/System Product release gives information on migrating from one JES2 release level to another.

Figure 1-2. Supported Combinations of JES2 and the BCP				
	JES2 COMPONENT			
LEVEL OF THE TARGET MVS/SP BCP	**FMID = HJE1367** Shipped with: MVS/SP Version 1 Release 3.6	**FMID = HJE2215** Shipped with: MVS/SP Version 2 Release 1.5 Release 1.7	**FMID = HJE2221** Shipped with: MVS/SP Version 2 Release 2.0 MVS/SP Version 3 Release 1	**FMID = HJE3311** Shipped with: MVS/SP Version 3 Release 1
MVS/SP Version 2 Release 2.0	Permissible Combination	Permissible Combination	Permissible Combination	Not Permissible
MVS/SP Version 3 Release 1	Permissible Combination (see Note 2)	Permissible Combination	Permissible Combination	Permissible Combination
MVS/SP Version 3 Release 1.1	Permissible Combination (see Note 2)	Permissible Combination	Permissible Combination	Permissible Combination

Notes:

1. Within a JES2 multi-access spool complex, JES2 components of all member systems must either be:

   - FMID = HJE3311,
   - or FMID = HJE2221,
   - or a combination of FMID = HJE2215 and FMID = HJE1367.

2. These JES2 and BCP combinations do not support the Storage Management Subsystem in MVS/DFP Release 3.1.

The JES3 Component of MVS/ESA

Figure 1-3 shows which JES3 release level operates with the Version 3 Release 1 base control program (BCP).

If your target BCP supports your current JES3 subsystem, you need not reinstall JES3 at the time you install the new BCP. However, if you intend to install the Release 3.1 BCP, you need to apply PTFs to JES3 systems (FMID = HJS = 2329, FMID = HJS2215, FMID = HJS2220), in the complex. Therefore, IBM recommends that you keep up with new versions of JES3 as soon as it is convenient. The *Program Directory* shipped with each MVS/System Product release gives information on migrating from one JES3 release level to another.

Figure 1-3. Supported Combinations of JES3 and the BCP					
	JES3 COMPONENT				
	FMID = HJS2329 **Shipped with:** **MVS/SP** **Version 1** Release 3.4 Release 3.5 **MVS/SP** **Version 2** Release 1.2 (after 12/18/84) Release 1.3	**FMID = HJS2215** **Shipped with:** **MVS/SP** **Version 2** Release 1.5 Release 1.7 Release 2.0	**FMID = HJS2220** **Shipped with:** **MVS/SP** **Version 2** Release 2.1 **MVS/SP** **Version 3** Release 1	**FMID = HJS3311** **Shipped with:** **MVS/SP** **Version 3** Release 1.1	**FMID = HJS3312** **Shipped with:** **MVS/SP** **Version 3** Release 1.2
LEVEL OF THE TARGET MVS/SP BCP					
MVS/SP Version 2 Release 2.0	Permissible Combination	Permissible Combination	Permissible Combination	Not Permissible	Not Permissible
MVS/SP Version 2 Release 2.1	Permissible Combination	Permissible Combination	Permissible Combination	Not Permissible	Not Permissible
MVS/SP Version 3 Release 1	Not Permissible	Permissible Combination with PTFs	Permissible Combination with PTFs	Permissible Combination (when available)	Permissible Combination (when available)
MVS/SP Version 3 Release 1.1	Not Permissible	Permissible Combination	Permissible Combination	Permissible Combination	Permissible Combination
MVS/SP Version 3 Release 1.2	Not Permissible	Permissible Combination	Permissible Combination	Permissible Combination	Permissible Combination

Notes:

1. JES3 Release 3.1.2 is the only JES3 release that supports the Data Facility Storage Management Subsystem.

2. FMID = HJS2329 is not support by MVS/DFP.

Resource Measurement Facility (RMF) Releases

If you intend to use RMF on Release 3.1, you need to install RMF Version 4 Release 1 (5665-029).

Each time you install a new JES2 or JES3 level, you must re-assemble the RMF modules that communicate with JES control blocks. These modules are described in the *RMF Program Directory* shipped with the RMF program.

Changes and Additions to System Libraries for Release 3.1

Before installing Release 3.1 you need to do the following.

You will need to allocate the following new distribution libraries (DLIBs):

- SYS1.AMIGLIB

And you will need to allocate the following new system libraries (SYSLIBs):

- SYS1.MIGLIB (SYS1.MIGLIB is automatically concatenated immediately following SYS1.LINKLIB in the LNKLST concatenation.)
- If not already allocated:
  - SYS1.SBLSCLI0
  - SYS1.SBLSKEL0
  - SYS1.SBLSTBL0
  - SYS1.SBLSPNL0
  - SYS1.SBLSMSG0

See the *Program Directory* included with the Release 3.1 distribution tapes for recommendations on the sizes of these new and changed libraries.

Changes to MVS for Release 3.1

The following checklist summarizes the updates that might create the need for changes to your program code or affect the execution of your programs and operator procedures. **Be sure to also read Chapter 3, "Programming Considerations" on page 3-1** to determine how your programs will be affected by updates to macros and control blocks and **Chapter 4, "Operating Considerations" on page 4-1** to determine how operator procedures will be affected by updates to commands.

* IPCS Replaces PRDMP

  IPCS replaces PRDMP as the dump formatting facility. PRDMP's functions are now performed by IPCS through various subcommands, verb exits, and CLISTs. To format and view all traces, including GTF traces, you must use IPCS.

* IPCS Exit Routines

  The process for including installation IPCS exits in SYS1.PARMLIB is changed, see *MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization*.

* MODIFY LLA Command

  The updated MODIFY LLA command allows you to refresh the entire LLA directory as before, or to identify a set of modules and/or libraries to be selectively refreshed. This selective refresh allows updated LNKLST modules to be activated without disturbing other unrelated LNKLST modules.

  The JCL IEFPARM DD statement may also be used to name a SYS1.PARMLIB member to be refreshed.

* SVC 33 and SVC 60

  SVC 33 and SVC 60 are moved from the LPA to nucleus.

* Automated Spin Loop Recovery

  In Release 3.1, the system automatically recovers from an excessive spin time-out condition (a condition in which one CPU waits for a response from another CPU that is probably locked or waiting also). You can modify both the spin loop time-out interval and the default sequence of recovery actions through a new PARMLIB member EXSPATxx. (The SET command has a new EXS option that allows you to select dynamically the EXSPATxx member.) Previously, the system issued an operator message indicating the excessive spin condition that required action from the operator. The spin loop time-out interval was also reduced.

* Incompatible Frame Count Field

  RSM has a new frame count field (a fullword in size), RAXFMCT, that removes the 256-megabyte limitation on tracking the number of real storage frames associated with an address space. The original frame count field (a halfword in size), ASCBFMCT, still exists but is no longer used. (See "ASCB Frame Count" on page 3-17 for other fields that have changed incompatibly for ASCB frame count.)

* SVC Dump Processing

  In Release 3.1, SVC dump processing is changed to decrease the amount of time the system is non-dispatchable while it is taking an SVC dump.

- SVC Dump Parameter List Validation

  When SVC dump detects an error during dump parameter list validation, it will attempt retry and provide a return code rather than percolating to the invoker's recovery routine.

- Unformatted MVS Dump Records

  The mapping of unformatted dumps is updated incompatibly because of improvements to the system. The mapping macro for dump records, BLSRPRD, is updated from 4104 bytes to 4160 bytes. You need to reassemble AMDSADMP for standalone dumps to be mapped correctly. The logical key is expanded from 8 to 64 bytes to support new function.

- Dynamic IPCS Dump Directory Allocation

  You need to review and, if necessary, modify the BLSCDDIR CLIST so that the dump directories allocated by BLSCDDIR will conform to conventions regarding data set naming, size, and placement on direct access volumes.

- TSO Interactive Functions

  The TSO interactive functions are removed from Release 3.1. If you are not running TSO/E, you need to install HT1310 (base TSO). All base TSO code that supports interactive processing is removed. TSO/E Version 1.4 or higher contains what you need for interactive processing.

  SMF records (types 30, 34, 35) now include a terminal symbolic name for TSO/E.

- Page Data Sets and Swap Data Sets

  The maximum size of page data sets and swap data sets is increased to 16M slots per data set.

- Smaller Extended Regions

  In Release 3.1, you can obtain less than 32 megabytes of extended virtual storage through an enhanced IEFUSI exit.

- Global Resource Serialization Threshold Default

  The default threshold of 4111 concurrent requests by an authorized caller increases to 16,384 concurrent requests. This value is stored in the GVTCREQA field of the GVT. The threshold value for unauthorized callers remains at 4096.

- RSM Trace

  The RSM trace is replaced by a new trace through component trace.

- RSM Swap-Out Complete Sysevent

  The parameter list for the swap-out complete sysevent is incompatibly updated.

- BLSUGWDM Routine for Limiting Access to TSO Commands and CLISTs

  As of Release 3.1, IBM no longer supplies a dummy BLSUGWDM load module. If you want to use the BLSUGWDM exit, you must create a separate BLSUGWDM load module in a LNKLST library.

- I/O FLIH and External FLIH

  I/O FLIH and the external FLIH are moved from the LCCA to the supervisor control save area.

- Extended Error Descriptor (EED)

  Access registers are added at X'4C' location.

- SADMP

  The block size for a standalone dump data set is updated to 29120.

- PC Routines Per Entry Table

  The maximum number of PC routines per entry table (invocation of ETCRE) is reduced from 256 to 128. If you need more than 128 PC routines, you can reserve system linkage indexes by updating the number of reserved linkage indexes using the new keyword, NSYSLX, in the IEASYS00 member of PARMLIB.

- Storage Shortage Message

  The descriptor code of the storage shortage message changed to 11.

Changes to Publications for Release 3.1

Many of the diagnostic manuals in the MVS library are revised and reorganized in a task-oriented approach. The following charts show which books are renamed for Release 3.1. For a complete description of the new MVS/ESA library, see *General Information Manual* or *MVS/ESA Library Guide*.

Old Book (MVS/XA SP Version 2)	New Title (MVS/ESA SP Version 3)
Diagnostic Techniques	Basics of Problem Determination Diagnosis: Special Analysis Techniques
Debugging Handbook, Volume 1	Diagnosis: Using Dumps and Traces Diagnosis: System Reference
Debugging Handbook, Volumes 2-6	Diagnosis: Data Areas, Volumes 1-5
System Logic Library Books	Component Diagnosis: component name Component Diagnosis and Logic: component name
Supervisor Services and Macro Instructions, Part 1	Application Development Guide
Supervisor Services and Macro Instructions, Part 2	Application Development Macro Reference
SPL: System Macros and Facilities, Volume I	SPL: Application Development Guide
SPL: System Macros and Facilities, Volume II	SPL: Application Development Macro Reference

The following books are new:

Title	Purpose
Basics of Problem Determination	Provides an introduction to system diagnosis in general and pointers to individual component diagnosis books.
Planning: Dump and Trace Services	Describes how to set up dumps and traces.
SPL: Application Development Guide--Extended Addressability	Provides indepth explanation of the new advanced address space facility.

Chapter 2. System Generation, Customization, and IPL

Chapter 1, "Positioning and Planning" describes the activities to be done before installing a level of Release 3.1. This chapter describes the activities you must do at installation.

At installation time you need to install related products and PTFs. Refer to Figure 1-1 on page 1-3 for a summary of these product-positioning requirements. Contact your IBM representative for up-to-date information on when the required PTFs are available and how to obtain them.

Define System Parameters

Release 3.1 changes to SYS1.PARMLIB are summarized in the following section and described in detail in *MVS/ESA SPL: Initialization and Tuning*.

New, Updated, or Deleted SYS1.PARMLIB Members

Member	Release	Description of Update
BLSCECT	3.1	The following statements are new or changed: DATA, DIALOG, EXIT, IMBED, NOTE, SYMBOL, and TSO. The IMBED statement is a new statement that identifies an additional PARMLIB member to be processed. **Note:** BLSCECT contains IMBEDs for two optional members, BLSCUSER and BLSCECTX. You may use BLSCUSER to define installation and vendor PARMLIB members for subsystems that are installed on your system. BLSCECTX is a version of BLSCECT for non-BCP components.
COFVLFxx	3.1	A new member. COFVLFxx defines the classes of data objects that the virtual lookaside facility (VLF) manages.
CSVLLAxx	3.1	A new member. CSVLLAxx contains a list of entry point names and/or LNKLST libraries that can be selectively refreshed via the MODIFY command.
EXSPATxx	3.1	A new member. EXSPATxx allows an installation to specify a spin loop timeout interval and to define automatic responses to certain types of excessive spin loops.
IEAIPSxx	3.1	The value range for the CWSS and PWSS parameters increases to 214748364. The maximum value for the SRV keyword becomes 999,999,999.
IEASVCxx	3.1	A new parameter, AR, is added to the SVCPARM statement to support SVCs issued in access register (ASC) mode. See "Programming Functions for Release 3.1" on page 3-1.
IEASYSxx	3.1	A new parameter, NSYSLX, allows you to specify the number of slots in the system function table to be reserved for system linkage indexes.
IECIOSxx	3.1	There are new parameters for MIH intervals to help you detect missing interrupt conditions.
IEFSSNxx	3.1	If a record for the storage management subsystem is defined in IEFSSNxx, the system operator can start the storage management subsystem during IPL.

Member	Release	Description of Update
IGDSMSxx	3.1	A new member. IGDSMSxx contains the parameters that direct storage management subsystem initialization and specify the name(s) of the data set(s) containing the definition of the storage management subsystem constructs. The parameters are: • ACDS specifies the name of the active control data set (ACDS). If this parameter is not specified, the Storage Management Subsystem will prompt the operator to enter it. • ASCSDEFAULTS specifies whether an installation is interested in using RACF-related automatic class selection (ACS) routine variables. • ASID specifies whether the Storage Management Subsystem is to trace a specific address space (asid) or all address spaces (*). • COMMDS specifies the name of the communications data set that the Storage Management Subsystem uses. If this parameter is not specified, the Storage Management Subsystem will prompt the operator to enter it. • DESELECT deletes one or more events from the list of events to be traced. (See IGDSMSxx in *MVS/ESA SPL: Initialization and Tuning* for a list of the events.) • INTERVAL specifies the amount of time that the storage management subsystem is to wait before synchronizing with the other storage management subsystems in the complex. • REVERIFY directs the Storage Management Subsystem to check a user's authority to allocate a new data set and use storage and management class at job interpretation and execution time. • JOBNAME specifies whether the Storage Management Subsystem is to trace a specific job or all jobs. • SELECT allows you to select one or more events in the list of events the Storage Management Subsystem is to trace. (See IGDSMSxx in *MVS/ESA SPL: Initialization and Tuning* for a list of events.) • SIZE specifies the size of the trace table in kilobytes or megabytes. • TRACE specifies whether tracing is to be ON or OFF. • TYPE specifies whether the Storage Management Subsystem is to trace error entries (ERROR) or all entries (ALL).
MPFLISTxx	3.1	MPFLISTxx contains the following new parameters: AUTO, DEFAULT, and NOENTRY.
VATLSTxx	3.1	There is a new VATDEF statement for setting the installation's default USE attribute for DASD volumes. The VATDEF statement must be the first statement in VATLSTxx. If no VATDEF statement appears, the default USE attribute is PUBLIC. In addition, as of Release 3.1, you can use generic volume serial numbers and device types to define a group of volumes in one VATLSTxx entry. At system initialization time the operator can select the appropriate VATLSTxx member by entering VAL=xx.

SYS1.MIGLIB

In Release 3.1, the new system library SYS1.MIGLIB eases migration by allowing IPCS and component formatting and analysis programs supplied with Release 3.1 to function in a Release 2.x.x environment. (See *MVS/ESA System Generation* for details on the contents and generation of the SYS1.MIGLIB library). During IPL/NIP, SYS1.MIGLIB is treated as a required link list library and should be concatenated after SYS1.LINKLIB.

SYS1.SAMPLIB

The Release 3.1 SYS1.SAMPLIB contains samples of of the CSVLLIX1 and CSVLLIX2 user exits. The list below gives the name of the SYS1.SAMPLIB member and the type of sample provided:

Sample Type	SYS1.SAMPLIB Member
CSVLLIX1	CSVLLIX1
CSVLLIX2	CSVLLIX2

The following members used to support SYS1.MIGLIB but will not be shipped in SAMPLIB:

- MIGJOB01
- SAMPCVAF
- SAMPEOF
- SAMPJOBC
- SAMPSAM
- SAMPTCAM
- SAMPVSAM
- SAMPVTAM

All SYS1.SAMPLIB members associated with SYS1.MIGLIB should be deleted from your code. See the *Program Directory* to determine the size of SYS1.SAMPLIB.

IPL the System

Once you complete the system installation and customization processes you are ready to IPL. Actually, what is commonly thought of as IPL is more accurately described as system initialization. It consists of three phases: IPL, NIP, and master scheduler initialization. Even though some aspects of system initialization have changed as of Release 3.1, once it completes, the running MVS/ESA system appears the same as for previous MVS/XA releases.

The NIP Console

The Release 3.1 system initialization begins with IPL processing, which requires no operator intervention. NIP processing follows IPL and requires operator attention at the NIP console that is defined by the MVSCP. Even though the NIP console can be a different device from the MCS master console, IBM recommends that the same device be used for both. Using the same device ensures that all MVS operator messages appear in the same place. If you have chosen to have separate consoles, once IPL completes, you can leave the NIP console unattended and move to the MCS master console.

There are two steps to follow at the NIP console:

1. Respond to message IEA101A "SPECIFY SYSTEM PARAMETERS"

2. Respond to message IEA347A "SPECIFY MASTER CATALOG PARAMETERS"

IPL Messages

During IPL, the system may load a device descriptor table (DDT). The DDT includes references to device support modules for devices that are in your configuration as well as references for devices that are not in your configuration. The latter references will cause message IEA093I (unresolved weak external reference) to be extraneously written to the console log.

Default System Names

During system initialization, Release 3.1 assigns the default system name of NONAME if the SYSNAME= parameter is not specified in the IEASYSxx member of SYS1.PARMLIB or on the reply to the SPECIFY SYSTEM PARAMETERS message. Releases prior to Release 2.2 assigned the SMF system ID.

You should code a SYSNAME= value in order to uniquely identify each MVS system. This system name is used to identify the originating system for messages in the multiple console support (MCS) hardcopy log and in the display created by the DISPLAY R command. Without specific SYSNAME=values in multi-system complexes, it is impossible to determine which system actually issued the message in the hardcopy log.

In addition, IBM recommends that you use common system names across components that separately specify system names (SYSNAME, SMFID, and JES3 MAIN, for example). By doing so, you will avoid seeing the system name "change" during IPL.

Chapter 3. Programming Considerations

This chapter describes differences that might affect user-written assembler programs including non-IBM modifications to the system. The changes are grouped according to the type of programming change they represent: new and updated functions, job control language, macros, or control blocks and tables.

Installations or programmers new to MVS are expected to be familiar with the topics in the *MVS/ESA Conversion Notebook, Volume 1*, which describes differences between MVS/370 and MVS/XA, including new programming techniques for taking advantage of the 31-bit addressing capability that is a part of MVS/XA. Reading the *MVS/ESA SPL: Application Development — 31-Bit Addressing* and *MVS/ESA SPL: Application Development--Extended Addressability Guide* publications are also recommended.

Programming Functions for Release 3.1

Release 3.1 uses the architectural extensions to give you access to virtual storage beyond the current two gigabyte limit through data spaces and access registers. A data space is a contiguous area of virtual storage that holds up to 2 gigabytes of data. Access registers (ARs) allow you to concurrently access up to 15 different address spaces and data spaces. The address space control (ASC) mode indicates to the processor where the addresses of the data are located. In access register (ASC) mode, the processor uses both the general purpose registers and the access registers to locate an address in an address or data space.

Access Registers	0	1	Identify additional address spaces or data spaces	14	15
General Purpose Registers	0	1	Identify locations within an address or data space	14	15

Figure 3-1. Access Registers and General Purpose Registers

For more information on how to use access registers, see *MVS/ESA SPL: Application Development--Extended Addressability Guide.*

Processor-managed linkage stacks simplify program linkage because the processor, rather than the system, manages the saving of linkage registers and status. Processor linkages in your existing programs do not require any revision. You can, however, use the new linkages to ease the process of addressing across address spaces.

The system provides new and enhanced services that extend current addressing limits by allowing multiple address space addressing capability. You can isolate data and programs in separate addressable areas, increase performance, and decrease I/O to DASD through the use of the following new and enhanced functions:

- "Linkage Stack" on page 3-2
- "Data Spaces" on page 3-3
- "Virtual Lookaside Facility (VLF)" on page 3-4
- "LNKLST Lookaside" on page 3-4

There are also a variety of other programming enhancements.

Linkage Stack

The linkage stack is an area of control program storage used to save and restore program linkage information. Figure 3-2 shows how a program uses the linkage stack. The call from Program 1 to Program 2 automatically places all the caller's status on the linkage stack. The return from Program 2 to Program 1 automatically restores all the caller's status from the linkage stack.

Linkage Stack

Current linkage stack entry

◄------- (stack)------------
    ---------(unstack)-------►

Program 1
call
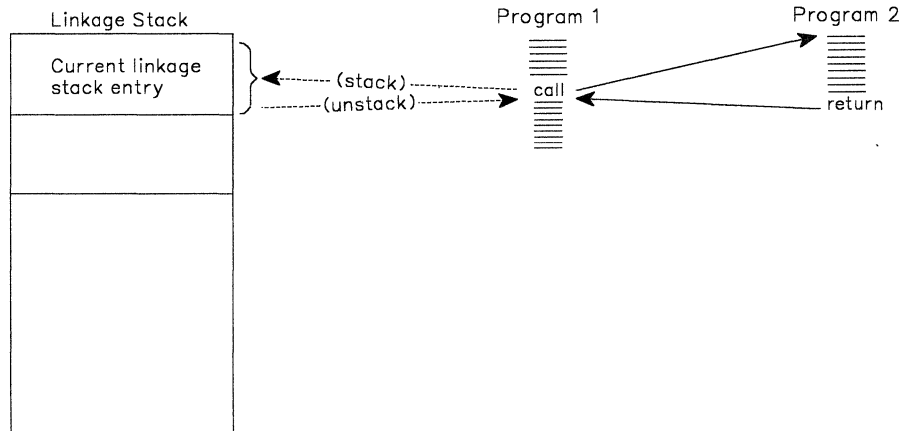
Program 2
return

Figure 3-2. Example of Using the Linkage Stack

The linkage stack is available for TCBs and SRBs that are running in primary or AR address space control (ASC) mode. Programs running under the TCBs or SRBs can be problem or supervisor state, locked or unlocked, enabled or disabled. The linkage stack consists of two parts: a normal linkage stack of 96 entries for use by programs that run under the work unit and a recovery stack that can be used by the program's recovery routines after the normal linkage stack becomes full. (The system abends the program with a "stack full" interruption code). In a program in which you anticipate the need for a larger linkage stack you can use the LSEXPAND macro to expand the size of the normal and recovery parts of the linkage stack.

To add and delete entries on the linkage stack, you use the following assembler instructions:

- PC - The stacking program call instruction. The stacking program call performs more functions than the basic program call. When PC passes control to a routine in the primary address space or in another address space, it adds an entry to the linkage stack.

- BAKR - The branch and stack instruction. It adds an entry to the linkage stack when it branches to another routine within the same address space.

- PR - The program return instruction. It restores the caller's status record and deletes an entry from the linkage stack when it returns from a call or branch made with either a stacking PC or BAKR.

For more information about using linkage stacks, see *MVS/ESA SPL: Application Development--Extended Addressability Guide*.

Data Spaces

A data space is a data-only space that has a range of up to 2 gigabytes of contiguous virtual storage addresses that a user can ask the system for. Within a data space, the addresses are available and contiguous because the system does not need to reserve addresses for such areas as the nucleus, SQA, or LSQA. Unlike an address space, a data space can hold only data; it does not contain MVS control blocks, common areas, or system services (such as VSM).

Data spaces can help you improve the structure and the reliability, availability, and serviceability (RAS) of your programs by allowing you to isolate data from code. You can store programs in data spaces but not execute them there.

Authorized programs can create and share data spaces with programs in another address space. Unauthorized programs can only create data spaces for their own use but may share data spaces created by authorized programs. In application programming, data-in-virtual processing allows you to map data-in-virtual objects into a data space.

Creating, Deleting, and Managing Data Spaces

You may use the DSPSERV CREATE macro to create one of two types of data spaces:

* Data spaces that may only be referenced by programs running in the primary and home address space of the address space that owns the data space (SCOPE = SINGLE)

* Data spaces that may be referenced by programs running in the data space owner's primary address space and other address spaces (SCOPE = ALL). Only authorized programs can create and share these data spaces with other programs.

You use the DSPSERV DELETE macro to delete the data spaces.

Your installation can control the use of data spaces by specifying the number of data spaces available to a user address space, the maximum total size of all data spaces owned by a user address space, and the default size of data spaces. You can override the IBM defaults by using the SMF user exit IEFUSI.

To fully understand the rules that govern the use of the data spaces and the processes by which to create, delete, and access them, see

* *MVS/ESA SPL: Application Development--Extended Addressability Guide*
* *MVS/ESA SPL: System Modifications*
* *MVS/ESA SPL: User Exits*

Creating, Terminating, and Managing Address Spaces

You can create an address space by using the ASCRE macro instruction in an authorized program. Parameters on this macro specify the attributes of the address space and pass parameters to the new address space. You can terminate the address space created by the ASCRE macro by using the ASDES macro. The ASEXT macro allows a program in the created address space to extract a copy of the parameter list supplied on the ASPARM parameter on the ASCRE macro.

Virtual Lookaside Facility (VLF)

The virtual lookaside facility (VLF) allows components, subsystems, or applications, from an authorized program, to place frequently-used named objects (such as CLISTs or load modules). Rather than having the system perform I/O to retrieve a data object from DASD every time the data object is referenced, you can use VLF as an alternate fast path method of data retrieval; VLF can reduce the number of I/O operations to DASD.

Once you have obtained the data from DASD, you invoke VLF to create the named data object in virtual storage. VLF then keeps track of the object in its virtual storage, where you can retrieve it whenever an end user requires it. By storing frequently-used referenced data or programs in virtual storage instead of DASD, you can improve availability and performance through the reduction of I/O.

Defining, Removing, and Managing Objects with VLF

To use VLF, you need to establish object classes, the objects in the classes, and identify end users of the facility:

1. Use the COFDEFIN macro to define the class to VLF. VLF obtains the class attributes from input variables on the COFDEFIN macro as well as from the COFVLFxx member of parmlib. You can specify the amount of virtual storage VLF is to use and the characteristics of the data it is to manage. (See *MVS/ESA SPL: Initialization and Tuning* for information about COFVLFxx). The COFPURGE macro deletes an entire class of VLF objects.

2. Use the COFIDENT macro to identify an end user to VLF. The COFCREAT and COFRETRI macros allow an application to obtain a copy of a VLF object on behalf of an end user. You can terminate an end user's access to the class of VLF objects associated with the specified user token (UTOKEN) with the COFREMOV macro.

3. Use the COFNOTIF macro to notify VLF that some set of VLF objects have become invalid due to changes in the "permanent" data, the original data, outside of the VLF.

For more information on using VLF and the specific syntax for the VLF macros, see *MVS/ESA SPL: Application Development Guide* and *MVS/ESA SPL: Application Development Macro Reference*.

LNKLST Lookaside

In Release 3.1, LNKLST lookaside (LLA) is enhanced to use VLF to retrieve data (LNKLST modules) from data spaces rather than continually fetching the modules from DASD. This enhancement potentially reduces program fetch time by maintaining the copies of LNKLST modules in a data space. The LLA updates also reduce the need for system tuning, simplify LNKLST maintenance by permitting selective LNKLST updates, and increase system availability by reducing the number of IPLs required because of LNKLST maintenance.

LLA also provides two new user exits, CSVLLIX1 and CSVLLIX2, that allow you to obtain LNKLST module-fetch statistics and control which LNKLST modules are placed in the VLF-managed data space.

Data-In-Virtual Enhancements

In Release 3.1, you can specify VSAM SHAREOPTIONS 2, 3, and 4 as well as
SHAREOPTIONS 1 in the access method services control statements describing the
linear data set you will reference as a data-in-virtual object. SHAREOPTIONS
indicates the type of sharing protocol intended:

Option   **Protocol**

1	single updater **or** multiple readers
2	single updater **and** multiple readers
3	multiple updaters and multiple readers in a single MVS system
4	multiple updaters and multiple readers across multiple MVS systems

For a description of VSAM SHAREOPTIONS, see *MVS/XA Integrated Catalog
Administration: Access Method Services Reference.* Whenever you specify a share
option other than 1, you must also specify the new keyword, LOCVIEW, on the
ACCESS parameter of the DIV macro. LOCVIEW provides a consistent view of a
data-in-virtual object that multiple users might share.

In Release 3.1, data-in-virtual processing also allows you to map data-in-virtual
objects into a data space. To do the mapping, you must use SHAREOPTIONS
option 1 and specify or default to LOCVIEW = NONE on the ACCESS option.

Note: It is the programmer's responsibility to ensure proper serialization in a
multiple-user environment. In addition, SHAREOPTIONS 4 serialization is enforced
across multiple systems only if the systems are part of a global resource serialization
complex.

Dynamic Allocation Message Processing

With Release 3.1, you have the option of building an SVC 99 parameter list
extension to specify message processing options, and you can request message
processing services as part of an SVC 99 call. By using the SVC 99 parameter list
extension to specify that the system provide message descriptions and message
processing, you eliminate the need to also invoke the DAIRFAIL routine. The
system can optionally produce any message descriptions resulting from your
allocation request.

If a program builds one, the SVC 99 parameter list extension, as well as the
parameter list, is accessible through the IEFDB401 installation exit described in
MVS/ESA SPL: User Exits.

In addition, IBM recommends that when you write new programs requiring message
processing (or when you update existing ones having this requirement), you invoke
the IEFDB476 message processing routine with parameters mapped by IEFZB476
rather than invoke DAIRFAIL. *MVS/ESA SPL: Application Development Macro
Reference* gives details on the IEFDB476 message processing routine.

Obtaining Storage Management Subsystem Messages

There are new error reason codes that can appear when storage management
subsystem is active and matching descriptions that can appear if you specify message
processing in the SVC 99 parameter list extension. When a request block extension
with such a request is supplied to SVC 99, subsequent invocation of DAIRFAIL or
IEFDB476 will include any storage management subsystem messages generated as a
result of the SVC 99. If an SVC 99 request block extension requesting message
retention is not supplied with the SVC 99 request, storage management subsystem

messages will not be processed via message processing (either DAIRFAIL or IEFDB476).

OUTADD and OUTDEL Macros and JES3

The OUTADD or OUTDEL macros, new for Release 3.1, invoke the dynamic output service allowing application programs to dynamically create or delete output descriptors containing output characteristics equivalent to those specified on the OUTPUT JCL statement. The macros are described in *MVS/ESA SPL: Application Development Guide*

Note: You cannot use OUTADD and OUTDEL functions in programs running on a system with JES3.

Checkpoint/Restart Restrictions

For Release 3.1, a Release 2.2.0 restriction is removed; jobs running with SWA control blocks that reside in virtual storage above 16 megabytes can now be restarted from a checkpoint. See *MVS/ESA Checkpoint/Restart Users Guide* for a complete description of the use of checkpoint restart.

If the program has entries on the access list or linkage stacks, it cannot use checkpoint/restart. For example, a program that uses data spaces or runs in access register (ASC) mode would have entries on the access list and, therefore, cannot use checkpoint/restart.

Disabled Reference Storage

In SP3.1, the system provides a new type of storage called disabled reference (DREF) storage. When a DREF page is not in real storage, it is in expanded storage. The system resolves page faults in DREF storage synchronously, and, therefore, DREF can be used by disabled code.

Your program can use DREF storage in place of fixed storage if it needs to reference storage while it is disabled. DREF storage is not backed by real frames until it is referenced.

To obtain storage from a DREF subpool, (203, 204, 205, 213, 214, 215, 247, or 248) use the SP parameter on the GETMAIN or STORAGE macros and specify the subpool number and LOC = ANY (all DREF subpools are above 16 megabytes). The real address of the data cannot be guaranteed, because the program should not reference the allocated area with the load real address (LRA) instruction with an I/O operation, or with dynamic address translation (DAT) turned off.

You can also use the DSPSERV macro to define a data space of DREF storage. *MVS/ESA SPL: Application Development--Extended Addressability Guide* contains information on how to create a data space with DREF storage.

Note: IBM recommends that you not use DREF when pageable storage would be sufficient.

New Fetch-Protected LSQA Subpools

The following fetch-protected LSQA subpools are new.

- Subpool 223 for task-related storage.
- Subpool 224 for job-step-related storage.
- Subpool 225 for explicitly assigned and freed storage.

When specifying these subpools on the GETMAIN or STORAGE macro, you must specify the LOC = ANY parameter. The new subpools have the same attributes as subpools 253, 254, and 255 except that the storage is fetch-protected. The new subpools allow programs running in key 0 to obtain fixed, key 0, fetch-protected storage in the private area.

Job Control Language (JCL)

If MVS/DFP Version 3 Release 1 is installed and the storage management subsystem is active, an installation must use ISMF to define data set classes and their attributes. End users can then use the new and updated JCL DD statement parameters included in Release 3.1 when creating data sets. With the storage management subsystem, it is easier for end users to define new data sets because there is no longer a need to specify data set storage and device characteristics such as those coded on the DCB, AMP, UNIT and VOLUME parameters. As a minimum, end users need only supply an appropriate data set name, and then the system then obtains the installation-defined attributes for the new data set.

Use these new parameters and statements only when MVS/DFP Version 3 Release 1 is running and the storage management subsystem is installed and active. If some processors in the complex are running with the storage management subsystem installed and the other processors are not, the job might fail during execution if it is routed to a processor without the storage management subsystem. Without the storage management subsystem, a non-VSAM data set instead of a VSAM data set might be allocated from the JCL information. Then, the access method will fail during job execution when it attempts to open the data set. To avoid this problem, use a JES control card in the JCL stream to specify which processor the job must be run on.

New and Updated DD Statement Parameters

There are nine new parameters on the JCL DD statement included in Release 3.1. Two other DD statement parameters, SPACE and VOLUME, are updated for this release. See *MVS/ESA JCL Users Guide* and *MVS/ESA JCL Reference* for more information. The new parameters are:

AVGREC	average record
DATACLAS	data class
KEYOFF	key offset
LIKE	like dsname
MGMTCLAS	management class
RECORG	record organization
REFDD	reference ddname
SECMODEL	security model
STORCLAS	storage class

Updates to the DCB and LABEL DD Statement Keywords

As of Release 3.1, all former keywords on the DCB and LABEL parameters for the JCL DD statement are independent DD statement parameters. They follow the rules for mutual exclusivity previously applicable to the DCB and LABEL parameters of which they were a part. See *MVS/ESA JCL Reference* for a table of the DD parameters that are mutually exclusive as of Release 3.1. While there is no need to change existing JCL, IBM recommends that programmers code the keywords as independent parameters when writing new JCL statements.

DISP = Disposition Processing of VSAM Data Sets

As of MVS/SP Version 3.1 with MVS/DFP Version 3 Release 1 installed, you can create and delete VSAM data sets through JCL. There is also a change in the way the system treats some DD statements for existing VSAM data sets.

In previous releases, DD statements for existing VSAM data sets were always treated as if the DISP= disposition were KEEP regardless of the actual JCL specification. When the storage management subsystem is installed and active, however, the system adheres to the DISP= specification for VSAM data sets. Thus, IBM recommends that you review the DD statement specifications for VSAM data sets. JCL that previously specified DELETE by mistake, for example, may require change.

Macros for Release 3.1

The sections below highlight the Release 3.1 updates to authorized and unauthorized macros that might need special consideration. Following them, "New, Updated, or Deleted Macros" on page 3-12 summarizes all of the macro updates that have occurred with Release 3.1. Note all previous MVS/XA macros are supported in MVS/ESA.

SPLEVEL Macro

The SPLEVEL macro enables you to compile programs for a specific level of MVS. SPLEVEL obtains the macro expansions that match the level at which your programs will be run. SPLEVEL 1 and 2 are still supported for the macros that previously had both MVS/370 and MVS/XA versions. SPLEVEL 3 is supported for some new MVS/SP 3.1.0 macros to compile programs to run in MVS/SP 3.1.0.

In Release 3.1, the SYSSTATE macro determines whether some macros that support callers in access register (AR) mode generate code in AR mode. If the SYSSTATE macro has not been issued, the code generated by the following macros is determined by the SPLEVEL value. If SPLEVEL is set to 3, the macros listed are generated according to the SYSSTATE default and thus generate code in AR mode. If SPLEVEL is 1 or 2, the generated code does not include instructions to support AR mode.

- COFCREAT
- COFDEFIN
- COFIDENT
- COFNOTIF
- COFPURGE
- COFREMOV
- COFRETRI
- CTRACE
- DSPSERV

For information about using SPLEVEL, see the section on selecting the macro level in:

- *MVS/ESA SPL: Application Development Macro Reference* (for authorized programs)

- *MVS/ESA SPL: Application Development Macro Reference* (for unauthorized programs)

Program Linkage Macros

The new macros ATTACHX, DETACHX, LINKX, SYNCHX, and XCTLX support access register and primary address space control (ASC) mode.

The ATTACH, DETACH, SYNCH, LINK, and XCTL macros may also be invoked while in access register (ASC) mode (P = H = S). However, the parameter list passed by these macros to the target program must be in the caller's primary address space. When either the ATTACH, DETACH, LINK or SYNCH macro is invoked, the completion of the target program restores the linkage stack to its condition prior to the macro invocation. When the XCTL macro is invoked, if the linkage stack is not the same upon completion of the target program as it was at the start of the macro invocation, an ABEND and a message (CSV030I) are issued.

Note: IBM recommends you use the ATTACHX, LINKX, SYNCHX, and XCTLX
macros instead of the ATTACH, DETACH, LINK, SYNCH, and XCTL macros in
access register mode.

SYSSTATE Macro

Many of the macros that may be coded in access register (ASC) mode require that
the SYSSTATE macro be coded prior to their invocation. The SYSSTATE macro
specifies the ASC mode in which the macro service is to be invoked.

STORAGE Macro

In most programs running in access register (ASC) and primary mode, you must use
the STORAGE macro instead of the GETMAIN and FREEMAIN macros to obtain
virtual storage. IBM recommends that you use the STORAGE macro, instead of
the GETMAIN and FREEMAIN macros, to obtain and free virtual storage.

Creating a Task or Address Space Resource Manager

In SP3.1, through the RESMGR macro, you can create your own task or address
space resource manager through the recovery termination manager. For details on
how to create a resource manager, see *MVS/ESA SPL: System Modifications.*

New, Updated, or Deleted Macros

The table below summarizes the changes that have occurred in authorized and unauthorized macros with Release 3.1. See the corresponding charts in the *MVS/ESA Conversion Notebook, Volume 1* for a description of changes to macros that occurred with the various levels of Version 2.

Macro	Release	Description of Update
ABEND	3.1	Updated to support callers in access register mode.
ALESERV	3.1	New for Release 3.1, ALESERV manages the contents of access lists.
AMDSADMP	3.1	Updated to support new DUMP options including options related to dumping data spaces.
ASCRE	3.1	New for Release 3.1, ASCRE creates an address space.
ASDES	3.1	New for Release 3.1, ASDES terminates an address space.
ASEXT	3.1	New for Release 3.1, ASEXT obtains parameters from the creator of the address space.
ATTACH	3.1	Updated to support access register mode callers. If the macro is issued in access register mode, the SYSSTATE macro must be coded to set ASCENV = AR prior to the ATTACH. ATTACH allows control to be passed from the attaching to the attached module without changing the addressing environment as determined by the ASC mode, access registers, and the extended authorization index. A new keyword ALCOPY is added for AR mode.
ATTACHX	3.1	New for Release 3.1. Performs the same function as ATTACH but can be issued in access register mode.
BLSABDPL	3.1	Describes the format parameter list, ADPLPFMT. BLSABDPL has been modified to add a mapping of ADPLPFXT, an extension to the format parameter.
BLSQMDEF	3.1	Used to generate model headers. BLSQMDEF has been extended to allow specification of such fields as acronyms for checking purposes. A new keyword, VIEWMATCH = VALUE, identifies a format model processor. The first byte of the view field in a model entry must match the format model processor exactly to the first byte of the view field in the format parameter in order to process the entry.
BLSQMFLD	3.1	Used to generate model entries. BLSQMFLD has 12 new keywords.
BLSRDRPX	3.1	New for Release 3.1, BLSRDRPX creates a map of the dump record prefix, which needed for interpretation of the dump.
BLSRESSY	3.1	Minor improvements.
BLSRPRD	3.1	New for Release 3.1, BLSRPRD creates a map of the dump record.
CALL	3.1	Updated to support callers in access register mode.
CALLRTM	3.1	The new parameter TYPE = is added. No local lock is required, because disablement is enforced.
COFDEFIN	3.1	New for Release 3.1, COFDEFIN defines a class of objects to VLF. Supports callers in access register mode.

Macro	Release	Description of Update
COFIDENT	3.1	New for Release 3.1, COFIDENT identifies an end user and associated major name search order to VLF. Supports callers in access register mode.
COFCREAT	3.1	New for Release 3.1, COFCREAT creates a data object in VLF storage. Supports callers in access register mode.
COFNOTIF	3.1	New for Release 3.1, COFNOTIF notifies VLF that some set of VLF objects have become invalid due to updates in the permanent data. Supports callers in access register mode.
COFPURGE	3.1	New for Release 3.1, COFPURGE immediately deletes an entire class of VLF objects. Supports callers in access register mode.
COFREMOV	3.1	New for Release 3.1, COFREMOV terminates an end user's access to the class of VLF objects associated with the specified user token (UTOKEN). Supports callers in access register mode.
COFRETRI	3.1	New for Release 3.1, COFRETRI retrieves (obtains a copy of) a VLF object on behalf of an end user. Supports callers in access register mode.
CPOOL	3.1	The LIST option is added. It allows callers to receive a list of the extents in a cell pool.
CTRACE	3.1	Provides the interface to the component trace service routine. It provides the following two services: **DEFINE** Indicates that the component be defined to component trace. **DELETE** Indicates that the component be deleted from component trace.
DETACH	3.1	Updated to support access register mode callers.
DETACHX	3.1	New for Release 3.1. Performs the same function as DETTACH but can be issued in access register mode.
DIV	3.1	There is a new keyword, LOCVIEW, for the ACCESS parameter to specify that more than one program can share access to a data-in-virtual object. LOCVIEW makes it possible to have a consistent view in virtual storage of data on permanent storage.
DSPSERV	3.1	New for Release 3.1, DSPSERV requests data space services. The following services are provided: **CREATE** Creates a data space **DELETE** Deletes a data space **RELEASE** Releases an area of a data space **DEFINE** Defines attributes for an area of a data space
DYNALLOC (SVC 99)	3.1	There are new text unit keys that make it possible to dynamically provide the equivalent of the following new JCL DD statement parameters. These parameters have meaning when MVS/ESA DFP Version 3 Release 1.0 is installed and the storage management subsystem is installed and active. **AVGREC** average record **DATACLAS** data class **KEYOFF** key offset **LIKE** like dsname **MGMTCLAS** management class **RECORG** record organization **REFDD** reference ddname **SECMODEL** security model **STORCLAS** storage class

Macro	Release	Description of Update
ESTAE	3.1	A new keyword CANCEL is added.
ESTAEX	3.1	New for Release 3.1, ESTAEX performs ESTAE function and can be issued in primary or access register mode and cross-memory mode.
ETDEF	3.1	ETDEF allows you to generate extended entry table descriptor lists without knowing or relying on the format of the list.
FESTAE	3.1	Supported only in primary mode with the primary and secondary address spaces equal to home.
FREEMAIN	3.1	When issued as a global branch entry, now supports callers in either primary ASC mode or access register ASC mode. It also now enforces disablement of the caller. (IBM recommends access register mode callers use the STORAGE macro instead of the FREEMAIN macro).
GETMAIN	3.1	When issued as a global branch entry, now supports callers in either primary ASC mode or access register ASC mode. It also now enforces disablement of the caller. (IBM recommends access register mode callers use the STORAGE macro instead of the GETMAIN macro).
ITTFMTB	3.1	New for Release 3.1, ITTFMTB generates mappings of the component trace format table.
LINK	3.1	Updated to support access register mode callers. (IBM recommends that access register mode callers use LINKX instead of LINK.)
LINKX	3.1	New for Release 3.1, LINKX performs LINK function and can be issued in access register mode. (IBM recommends that access register mode callers use LINKX instead of LINK.)
LOCASCB	3.1	Locates the ASCB address associated with a specified ASID or STOKEN. Programs executing in any ASC mode and in cross-memory mode can invoke the LOCASCB macro instruction. LOCASCB also has new parameters.
LSEXPAND	3.1	New for Release 3.1, LSEXPAND increases the number of entries in a linkage stack.
MGCR	3.1	MGCR now supports 31-bit programming in 31-bit storage.
OUTADD	3.1	Invoking the new dynamic output service, this macro allows an executing program to create an output descriptor containing processing options for a SYSOUT data set. Previously, output descriptors could only be specified by means of the JCL OUTPUT statement.
OUTDEL	3.1	Invoking the new dynamic output service, this macro allows an executing program to delete an output descriptor previously created by the OUTADD macro. Output descriptors contain processing options for a SYSOUT data set. Previously, output descriptors could only be created by means of the JCL OUTPUT statement.
PGSER	3.1	Updated to support access register mode callers.
POST	3.1	Updated to support callers in cross memory mode.
RESMGR	3.1	New for Release 3.1, RESMGR establishes or deletes a dynamic address space or task termination resource manager.

Macro	Release	Description of Update
SDUMP	3.1	Has a new SRB keyword that indicates the SRB to be dispatched when dumping completes. SDUMP also supports access registers. (IBM recommends that access register mode callers use SDUMPX instead of SDUMP.)
SDUMPX	3.1	New for Release 3.1, SDUMPX supports access registers. SDUMPX has two keywords, LSID and SUMLIST, which enable the dumping of data spaces. (IBM recommends that access register mode callers use SDUMPX instead of SDUMP.)
SETFRR	3.1	May be issued in any address space control mode. It also has a new keyword, DUMPOPX, for specifying the dump option parameter list created by SNAPX.
SETLOCK	3.1	Updated to support access register mode callers. It also has a new keyword, MODE, for specifying whether a lock is to be conditionally (or unconditionally) obtained.
SETRP	3.1	Updated to support access register mode callers.
SNAP	3.1	Updated to support access register mode callers. (IBM recommends that access register mode callers use SNAPX instead of SNAP.)
SNAPX	3.1	New for 3.1, SNAPX supports access register mode callers. (IBM recommends access register mode callers use SNAPX instead of SNAP.)
SPLEVEL	3.1	You may obtain downward compatibility explicitly by using the SPLEVEL macro to set a global macro symbol, &SYSSPLV, which may be used during assembly to determine the type of expansion to be generated. SPLEVEL allows an installation to assemble code on a MVS/SP 3.1 system that will run compatibly on the designated prior system level.
STORAGE	3.1	New for Release 3.1, STORAGE obtains and releases virtual storage for • Access register routines • TCB routines • SRB routines • Problem state routines • Supervisor state routines • PASN = HASN routines • PASN¬ = HASN routines (IBM recommends access register mode callers use the STORAGE macro instead of GETMAIN or FREEMAIN).
SVCUPDTE	3.1	Supports a new keyword (AR=) to indicate if an access register mode user can issue the specified SVC.
SYMREC	3.1	Can now be used by disabled authorized programs.
SYNCH	3.1	Updated to support access register mode callers. (IBM recommends that access register mode callers use SYNCHX instead of SYNCH.)
SYNCHX	3.1	New for Release 3.1, SYNCHX supports access register mode callers. (IBM recommends that access register mode callers use SYNCHX instead of SYNCH.)
SYSSTATE	3.1	New for Release 3.1. The SYSSTATE macro specifies at assembly time the ASC environment that will exist at execution time of the service invoked.

Macro	Release	Description of Update
TCBTOKEN	3.1	New for Release 3.1. Use TCBTOKEN to obtain the unique token that represents the specified TCB (TTOKEN). You can then use it to request the TTOKEN to be translated into a TCB address; this may help you determine whether the TCB still exists.
TESTART	3.1	New for Release 3.1. The TESTART macro tests for conditions that lead to an access register translation program interruption.
UCBDEVN	3.1	New for Release 3.1. UCBDEVN converts hexadecimal device numbers to printable characters.
VRADATA	3.1	VRADATA supports access register mode callers.
VSMLIST	3.1	VSMLIST supports the new LSQA and SQA subpools.
VSMLOC	3.1	Supports the new LSQA and SQA subpools.
WAIT	3.1	Updated to improve its use in a multi-address space environment. A new parameter allows WAIT to be issued when the caller is in cross memory mode.
XCTL	3.1	Updated to support access register mode callers. (IBM recommends that access register mode callers use XCTLX instead of XCTL.)
XCTLX	3.1	New for Release 3.1. XCTLX supports access register mode callers. (IBM recommends that access register mode callers use XCTLX instead of XCTL.)

System Control Blocks and Tables for Release 3.1

The following sections highlight control block-related changes that might affect existing programs when they run under Release 3.1. Following them, "New, Updated, or Deleted Control Blocks and Tables" on page 3-18 is a partial list of the system control blocks that have been updated, created, or deleted for Release 3.1. See *MVS/ESA Diagnosis: Data Areas, Volumes 1-5* for a detailed description of many MVS control blocks.

Program Properties Table (PPT) Entries

Release 3.1 adds the virtual-lookaside facility (VLF) and the storage management subsystem to the default PPT.

ASCB Frame Count

The following fields in associated with the ASCB frame count are increased incompatibly in size:

WPGDSIWO
WPGDWHOF
WPGDWLOF
WPGPSIWO
WPGPWHOF
WPGPWLOF
WPGLSIWL
WPGLSIWH
WMSTSIWH
WMSTSIWL
OUXBFMCT
MCVFMCT
MCVSBSIG
MCVSIWH
MCVSIWL
MCVTWSS
OUCBFIX
OUCBLGWS
OUCBPSO
OUCBSBFC
OUCBTWSS
OUCBWSS
OUXBFMCT

New, Updated, or Deleted Control Blocks and Tables

The table below lists some of the control blocks or tables that are new (NEW), updated (UP), deleted (DEL) or moved to virtual storage above 16 megabytes (ABOVE) for Release 3.1.. Because these similar changes to the control blocks listed might also have occurred prior to Release 3.1, be sure to consult the corresponding charts in *MVS/ESA Conversion Notebook, Volume 1*. Those charts contain a similar history of changes to MVS/XA control blocks that occurred during the release of Version 2.

The parentheses contain the mapping macro that defines the structure of the associated block.

Figure 3-3 (Page 1 of 5). New, Updated, or Deleted Control Blocks				
Control Block	**NEW**	**UP**	**DEL**	**ABOVE**
ABDPL (BLSABDPL)		3.1		
ABDPL (IHAABDPL)		3.1		
ACE (ILRACE)		3.1		
AHLWKAL	3.1			
AIA (ILRAIA)		3.1		
ASCB (IHAASCB)		3.1		
ASEO (IHAASEO)	3.1			
ASEW (IHAASEW)	3.1			
ASMVT (ILRASMVT)		3.1		
ASPCT (ILRASPCT)		3.1		
ASSB (IHAASSB)		3.1		
ASTE (IHAASTE)		3.1		3.1
ATA (ILRATA)		3.1		
ATTACH (IEZATTCH)		3.1		
AXAT (IHAAXAT)		3.1		
CBLS (IHACBLS)		3.1		
CB1		3.1		
CCT (IRACCT)		3.1		
CSD (IHACSD)		3.1		
CTE (ITTCTE)	3.1			
CTXI (ITTCTXI)	3.1			
CVT (CVT)		3.1		
DACA (IEFZB4IC)	3.1			
DASTE (IARDASTE)	3.1			
DCCB (IEEDCCB)		3.1		
DMDT (IRADMDT)		3.1		

Figure 3-3 (Page 2 of 5). New, Updated, or Deleted Control Blocks				
Control Block	**NEW**	**UP**	**DEL**	**ABOVE**
DSAB (IHADSAB)		3.1		
DVTAB (ILRDVTAB)		3.1		
EATTR (IEZEATTR)		3.1		
EED (IHART1W)		3.1		
EQSR (ILREQSRD)		3.1		
ESA (RTM2ESA)		3.1		
ESTA (IHAESTA)		3.1		
ETD0 and ETD1 (IHAETD)		3.1		
ETE (IHAETE)		3.1		
ETIB (IHAETIB)		3.1		
FFAP (IALFFAP)		3.1		
FRRS (IHAFRRS)		3.1		
GDA (IHAGDA)		3.1		
GSDA (IHAGSDA)		3.1		
IEESMFID		3.1		
IFASMFR3		3.1		
IHSA (IHAIHSA)		3.1		
IHASMWK		3.1		
JESCT (IEFJESCT)		3.1		
JFCB (IEFJFCBN)		3.1		
JSCB (IEZJSCB)		3.1		
LCCA (IHALCCA)		3.1		
LDA (IHALDA)		3.1		
LGE (ILRLGE)		3.1		
LGVT (ILRGVT)		3.1		
LGVTE (ILRLGVT)		3.1		
LKPT (IHALKPT)		3.1		
LLCB (IHALLCB)		3.1		
LLP1 (IHALLP1)		3.1		
LLP2 (IHALLP2)		3.1		
LRB (IHALRB)		3.1		
MCT (IRAMCT)		3.1		
NVT (IHANVT)		3.1		
OPSPL (ILROPSPL)		3.1		

Figure 3-3 (Page 3 of 5). New, Updated, or Deleted Control Blocks				
Control Block	**NEW**	**UP**	**DEL**	**ABOVE**
OUCB (IRAOUCB)		3.1		
OUSB (IRAOSCB)		3.1		
OUXB (IHAOUXB)		3.1		
PART (ILRPART)		3.1		
PARTE		3.1		
PAWA (IHAPAWA)	3.1			
PCB (IARPCB)		3.1		
PCT (ILRPCT)		3.1		
PCTRC (IHAPCTRC)	3.1			
PPT (IEFZB610)		3.1		
PRDINPUT		3.1		
PRDPL (ILRPRDPL)		3.1		
PRTAB (AHLPRTAB)		3.1		
PSA (IHAPSA)		3.1		
PVT (IHAPVT)		3.1		
QSR (ILRQSRCD)		3.1		
RAX (IARRAX)		3.1		
RB (IKJRB)		3.1		
RCE (IARRCE)		3.1		
RCFV		3.1		
RCT (IRARCT)		3.1		
RMCA (IRARMCA)		3.1		
RMCT (IRARMCT)		3.1		
RMPT (IRARMPT)		3.1		
RMSB (IRARMSB)		3.1		
RLA	3.1			
RTM2WA (IHARTM2A)		3.1		3.1
RT1W (IHART1W)		3.1		
SART (ILRSART)		3.1		
SARTE (ILRSART)		3.1		
SAT (ILRSAT)		3.1		
SCA (IHASCA)		3.1		
SCB (IHASCB)		3.1		
SCCB (IHASCCB)		3.1		

Figure 3-3 (Page 4 of 5). New, Updated, or Deleted Control Blocks				
Control Block	**NEW**	**UP**	**DEL**	**ABOVE**
SCE (IHASCE)		3.1		
SCFS (IHASCFS)	3.1			
SCTX (IEFASCTX)		3.1		
SCVA (IHASCVA)		3.1		
SCVT (IHASCVT)		3.1		
SDCT (ILRSDCT)		3.1		
SDIR (IGVSDIR)		3.1		
SDWORK (IHASDWRK)		3.1		
SDWA (IHASDWA)		3.1		
SFTE (IARSFTE)		3.1		
SHDR (IHASHDR)		3.1		
SLFP (IHASLFP)		3.1		
SLPL (IHASLPL)		3.1		
SLWA (IHASLWA)		3.1		
SPTRC (IHASPTRC)	3.1			
SPTT (IGVSPTT)		3.1		
SSJS (IEFSSJS)		3.1		
SSRB (IHASSRB)		3.1		
STCB (IHASTCB)		3.1		
SVCTABLE (IHASVC)		3.1		
SVT (IHASVT)		3.1		
TCB (IKJTCB)		3.1		
TCT (TCTIOT)		3.1		
TIOT (IEFTIOT1)		3.1		
TMTRC (IHATMTRC)	3.1			
TPARTBLE (ILRTPARB)		3.1		
TTE (IHATTE)		3.1		
UCB		3.1		
VAQST (IHAVAQST)		3.1		
WMST (IRAWMST)		3.1		
WPGDT (IRAWPGDT)		3.1		
WSAUTC (WSAUTC)		3.1		
WSAUTG (WSAUTG)		3.1		

Figure 3-3 (Page 5 of 5). New, Updated, or Deleted Control Blocks				
Control Block	**NEW**	**UP**	**DEL**	**ABOVE**
WSAUTL (WSAUTL)		3.1		
WSAVT (IHAWSAVT)		3.1		
XMD (IHAXMD)		3.1		3.1
XMCT (IHAXMCT)			3.1	
XPTE (IARXPTE)		3.1		
XQSRD (ILRXQSRD)		3.1		
XSB (IHAXSB)		3.1		

Chapter 4. Operating Considerations

The sections below highlight the Release 3.1 updates to messages, routing codes, and commands. Note all previous MVS/XA messages, codes and commands are supported in MVS/ESA.

MODIFY LLA Command

The updated MODIFY LLA command allows you to refresh the entire LLA directory as before, or to identify a set of modules and/or libraries to be selectively refreshed. This selective refresh allows updated LNKLST modules to be activated without disturbing other unrelated LNKLST modules.

PAGEDEL Command

The PAGEDEL command is a new command that allows the operator to delete local page data sets or swap data sets dynamically. This enhancement allows you to reconfigure the paging environment without an IPL, thus improving system availability.

DISPLAY Command

The DISPLAY command has new options that allow the master console to display time intervals for individual devices and device classes and that show you whether component trace is on or off. DISPLAY is also modified to display information about data space usage.

New, Updated, or Deleted Commands

The table that follows gives the updates to system commands that have occurred for Release 3.1. See *MVS/ESA Operations: System Commands* for a complete description of each command.

Command	Release	Description of Update
CHNGDUMP	3.1	The CHNGDUMP command allows you to reserve storage for SVC dump.
DEVSERV	3.1	If MVS/DFP Version 3 Release 1 is installed, this command allows you to inquire about the status of one or more devices, including whether or not they are managed by the storage management subsystem.

DISPLAY	3.1	The DISPLAY command has the following new options:
		
		IOS,MIH option
		  The IOS,MIH option displays, from any master console, the missing interrupt handler (MIH) time intervals for individual devices and device classes.
		
		TRACE option
		  The TRACE option displays whether component trace is on or off.
		
		DISPLAY A,name; DISPLAY TS,name; and DISPLAY JOBS,name are modified to display information about data space usage.

DISPLAY SMS	3.1	If MVS/DFP Version 3 Release 1 is installed, you can inquire about the status of all or part of the data sets managed by the storage management subsystem.
DISPLAY UNITS	3.1	If MVS/DFP Version 3 Release 1 is installed, the volume serial numbers are visible in the DISPLAY U display immediately after a VARY command for a ready unit.
DUMP	3.1	For 3.1, the DSPNAME option allows you to enter the quoted jobname of the data space or the hexadecimal ASID of the data space owner to be dumped and the data space name.
MODIFY LLA	3.1	Using MODIFY LLA's new option UPDATE=, you can now cause LLA to rebuild a specified part of the LNKLST directory by specifying specific entry points or LNKLST libraries in the SYS1.PARMLIB member CSVLLAxx.
MSGRT	3.1	If MVS/DFP Version 3 Release 1 is installed, you can use MSGRT D=SMS to send the output of the DISPLAY SMS command to a specific message display area or console or both.
PAGEADD	3.1	The PAGE option is added to so that PAGEADD can reactivate a data set that is draining as a result of the PAGEDEL command.

Command	Release	Description of Update
PAGEDEL	3.1	New for Release 3.1, PAGEDEL allows you to delete, replace, or drain a local page data set or swap data set without an IPL. DELETE option Migrates data from the specified data set to other page data sets and/or swap data sets that are in use by the system. After migrating all the data, the system deallocates the data set. REPLACE option Migrates data from the specified data set to a replacement data set. After migrating all the data, the system deallocates the data set. The replacement data set must be at least as large as the data set it is replacing. DRAIN option Makes the specified data set(s) read-only. As slots are freed during system operation, data is depleted ("drained") from the draining data set.
REPLY	3.1	You can now specify component trace options in reply to the prompts generated by the TRACE CT command.
SET	3.1	The SET command has the following updates: SMS = xx option If MVS/DFP Version 3 Release 1 is installed: SMS = xx is a new keyword that the storage administrator enters at the operator's console to start the storage management subsystem if it was not started during system initialization, or to restart the storage management subsystem if it has terminated. There must be a record for the storage management subsystem in the IEFSSNxx member of SYS1.PARMLIB when you enter SET SMS = xx. In addition, the storage administrator can change the storage management subsystem parameters by indicating, by means of xx, the appropriate IGDSMSxx member of SYS1.PARMLIB. IOS = xx option The IOS option allows you to respecify, add, or delete missing interrupt handler (MIH) time intervals for individual devices or device classes. Thus, you can dynamically select the IECIOSxx SYS.PARMLIB specification without an IPL, improving system availability and the function of the missing interrupt handler. EXS = xx option The EXS option allows you to dynamically select the EXSPATxx member of SYS1.PARMLIB that contains the excessive spin recovery actions and the excessive spin loop timeout interval.
SETIOS	3.1	New for Release 3.1, you can respecify, add, or delete missing interrupt handler (MIH) time intervals for individual devices or device classes without changing the IECIOSxx member of SYS1.PARMLIB.

Command	Release	Description of Update
SETSMS	3.1	If MVS/DFP Version 3 Release 1 is installed: the operator can use this new command to set storage management subsystem parameters from the operator's console.
SLIP	3.1	The SLIP command has the following updates: DSPNAME option Specifies the data spaces to be included in the SVC dump as a result of SVCD, SYNCSVCD, STDUMP, or TRDUMP action. DSSA option Requires that altered storage must be in the specified data spaces for the trap to match. PSWASC option Specifies the PSW address space control (ASC) mode the system must be in for the trap to match. SVC dump processing The default match limit for all ACTION = SVCD traps is 1. You can change the match limit with the MATCHLIM keyword when the SLIP trap is set. SYNCSVCD option Specifies that a synchronous dump is to be scheduled for the current address space when the trap matches.
START	3.1	You can now use the START command to start virtual lookaside facility (option VLF and LNKLST lookaside (option LLA).
STOP	3.1	You can now use the STOP command to stop virtual lookaside facility (option VLF and LNKLST lookaside (option LLA).
TRACE	3.1	You can now use the TRACE command to start and stop a component trace. You can also display the status of component trace with the TRACE command.
VARY	3.1	If MVS/DFP Version 3 Release 1 is installed, the system now rejects an attempt by the operator to issue a VARY ONLINE command for a unit with a volume serial number that duplicates a unit already online.
VARY ONLINE	3.1	If MVS/DFP Version 3 Release 1 is installed, you can use VARY ONLINE to signal the system that a new volume has become available, and, if it has a label, it can be used immediately. When devices are varied online, the default USE attributes defined in the VATLSTxx member of SYS1.PARMLIB are assigned.
VARY SMS	3.1	If MVS/DFP Version 3, Release 1 is installed, you can use this command to change the storage group or volume status.

Chapter 5. System Modifications

This chapter contains information relating to modifying the system. It introduces Release 3.1 changes to IBM-supplied exits and to methods of customizing IBM-supplied control blocks, tables, and procedures. Other sources of information are:

- *MVS/ESA MVS Configuration Program Guide and Reference*
- *MVS/ESA System Programming Library: System Management Facilities (SMF)*
- *MVS/ESA SPL: System Modifications*
- *MVS/ESA SPL: User Exits*

IEFEB400 Routine for Verifying an EDT

If you call IEFEB400 to verify an alternate EDT, you must pass an alphanumeric identifier as a parameter on the EXEC statement to indicate which of the alternate EDTs the system is to use. IEFEB400 compares the EDT with the current set of UCBs. If the EDT does not match the current set of UCBs, the mismatches are noted. Mismatches do not indicate that the EDT is in error; the EDT may represent a different set of UCBs. *MVS/ESA MVS Configuration Program Guide and Reference* explains the use of IEFEB400.

IEFDOIXT Routine for Extracting Dynamic Output Requests

As of Release 3.1, users can dynamically generate requests to create or delete output descriptors (containing processing options for a SYSOUT data set) by using the new OUTADD and OUTDEL macros. (OUTADD and OUTDEL are not available to programs running on JES3 systems.) IEFDOIXT, also new as of Release 3.1, is a dummy routine that can be replaced with an installation-specific module that validates or updates these requests. *MVS/ESA SPL: User Exits* describes the use of IEFDOIXT. *MVS/ESA SPL: Application Development Guide* describes the OUTADD and OUTDEL macros.

CSVLLIX1 and CSVLLIX2 Routines

As of Release 3.1, LLA also provides two new user exits, CSVLLIX1 and CSVLLIX2, that allow you to obtain LNKLST module-fetch statistics and control which LNKLST modules are cached into the VLF-managed data space.

IEFUSI Routine

As of Release 3.1, you can use the IEFUSI to control the use of data spaces by specifying the number of data spaces available to a user address space, the maximum total size of all data spaces owned by a user address space, and the default size of data spaces. You override the IBM defaults by using this SMF user exit.

BLSUGWDM Routine for Limiting Access to TSO Commands and CLISTs

As of Release 3.1, IBM no longer supplies a dummy BLSUGWDM load module. If you want to use the BLSUGWDM exit, you must create a separate BLSUDWDM load module in a LNKLST library.

Chapter 6. Problem Diagnosis

This chapter includes information related to dumping services, trace facilities, and debugging. Major changes in this area for Release 3.1, include the elimination of PRDMP and print dump EDIT and enhancements to the interactive problem control system (IPCS). The functions PRDMP and print dump EDIT previously provided are incorporated in IPCS. Additionally, Release 3.1 provides

- Improved component tracing (see "Component Trace" on page 6-14),
- Improved GTF TRACE (see "GTF Trace" on page 6-14).

Interactive Problem Control System (IPCS)

The Release 3.1 changes to IPCS affect:

- "IPCS Commands and Subcommands" on page 6-2
- "IPCS Exit Services" on page 6-6
- "Exit Control Table (ECT)" on page 6-7
- "PRDMP to IPCS Conversion Summary" on page 6-8

In Release 3.1, IPCS replaces PRDMP. IPCS retains the PRDMP macros to ensure that the code that uses existing PRDMP macros can recompile and reassemble properly. The macros are shipped in the same distribution and system libraries as they were in previous releases. See *MVS/ESA SPL: Application Development Macro Reference* for more information on IPCS-related macros.

You may need to take some of the following actions because of the elimination of PRDMP.

- Modify programs with dependencies on PRDMP internals to use the IPCS interface.

- Modify any programs that use PRINTJOBNAME, PRINTCURRENT, NUCLEUS, HEADER, and FORMAT exits. These exits are eliminated because PRDMP was the only user of these exits.

- If PRDMP was started from SYS1.PROCLIB procedures, use TSO to initiate dump offload and processing jobs, or use the SYS1.PROCLIB IPCS procedure.

A dump or trace from one level of the system can be processed on a different level of the system, but the processing must be performed using IPCS code and related materials from the system that generated the dump or trace.

- To look at a dump or trace produced on a Version 2 system, you can use a Version 3 system. You access your Version 2 level of IPCS code by providing a STEPLIB statement that identifies a Version 2 SYS1.MIGLIB. You access other Version 2 materials by providing additional statements that reference Version 2 libraries. See *MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization* for details.

- To look at a dump or trace produced on a Version 3 system, you can use a Version 2 system. You access your Version 3 level of IPCS code by providing a STEPLIB statement that identifies a Version 3 SYS1.MIGLIB. You access other Version 3 materials by providing additional statements that reference Version 3 libraries. See *MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization* for details.

IPCS Commands and Subcommands

The following table gives the changes to IPCS commands and subcommands that have occurred with Release 3.1. The changes affect both primary commands and subcommands. The subcommand changes can be grouped into those that improve analysis of end-user dumps, those that improve formatting a dump, and those that assist programmers in resolving problems with exits that use IPCS services.

Category	Subcommand	Release	Description of Update
For Analysis			
	NAME	3.1	The NAME subcommand identifies the data space or address space associated with an STOKEN.
	RSMDATA	3.1	The RSMDATA subcommand displays diagnosis information for the RSM component.
	STATUS	3.1	The STATUS subcommand is enhanced for virtual dumps to include the following information currently provided on the Abstract page: • Program producing the dump • Program requesting the dump • CPU serial number • CPU address • Contents of the SDWA • Address of the SDWA • SDUMP options • Original dump data set • Trace table control header address STATUS now provides functions previously provided by the PRDMP VERBEXIT CPUDATA.
For Debugging IPCS Function	TRAPLIST	3.1	The TRAPLIST subcommand now displays the status of the IPCS-supplied traps for the following additional services: map service, name service, and symbol service.
	TRAPOFF	3.1	The TRAPOFF subcommand deactivates IPCS-supplied traps for the following additional services: map service, name service, and symbol service.
	TRAPON	3.1	The TRAPON subcommand activates IPCS-supplied traps for the following additional services: map service, name service, and symbol service.
For Formatting	ARCHECK	3.1	New for 3.1, ARCHECK shows you what address spaces and data spaces are being addressed by the access registers.

Category	Subcommand	Release	Description of Update
	BLSCBSAA and BLSCBSAP	3.1	New for 3.1, BLSCBSAA and BLSCBSAP are used to generate problem screening reports for stand alone dumps.
	BLSCBSVA and BLSCBSVP	3.1	New for 3.1, BLSCBSVA and BLSCBSVP are used to generate problem screening reports for SVC dumps.
	BLSCBSYA and BLSCBSYP	3.1	New for 3.1, BLSCBSYA and BLSCBSYP are used to generate problem screening reports for SYSMDUMPs.
	BLSCPCSA	3.1	New for 3.1, BLSCPCSA prints the common service area and extended common service area.
	BLSCDDIR	3.1	New for 3.1, BLSCDDIR is automatically invoked by the IPCS subcommand to dynamically allocate a dump directory data set.
	BLSCPNUC	3.1	New for 3.1, BLSCPNUC prints the various types of nucleus storage.
	BLSCPRIV	3.1	New for 3.1, BLSCPRIV prints the private and extended private storage areas and control block summary for a specified ASID.
	BLSCPSQA	3.1	New for 3.1, BLSCPSQA prints the system queue area and extended system queue area.
	BLSCPRNT	3.1	New for 3.1, BLSCPRNT invokes BLSCPRIV to print the private and extended private storage areas and control block summary for the current ASID or the ASID selected on the JOBNAME. In addition, BLSCPRNT invokes one or more of print CLISTs BLSCPCSA, BLSCPNUC, and BLSCPSQA when specified.
	CBFORMAT	3.1	The CBFORMAT subcommand allows you to make more complete use of the options supported by the control block model processor. It formats and displays a control block or data area that is defined in the exit data table. You may also use it to test and execute user-written formatting routines and control block models.
	CLOSE	3.1	New for 3.1, CLOSE terminates the use of the resource(s) by IPCS. You can close the dump source(s), the dump directory, and/or the print and TOC files.
	COMPARE	3.1	The COMPARE subcommand compares two data items, making the results known to a CLIST by a return code and, optionally, makes the results known to you by a message.

Category	Subcommand	Release	Description of Update
	COPYDDIR	3.1	The COPYDDIR subcommand copies one or more dump descriptions from a specified dump directory into a dump directory that is in use.
	CPUTRACE	3.1	The CPUTRACE subcommand can be used to format CPU loop traces recorded in unformatted dumps.
	CTRACE	3.1	The CTRACE subcommand displays component trace information.
	DSPL3270	3.1	The DSPL3270 subcommand is deleted. It is replaced by the IPCS dialogs.
	GTFTRACE	3.1	The GTFTRACE subcommand displays GTF trace information.
	IOSCHECK	3.1	The IOSCHECK subcommand provides the total function that VERBEXIT IOSDATA previously provided.
	LIST	3.1	The LIST subcommand is updated.
	LISTDUMP	3.1	The LISTDUMP subcommand displays the names of the dump data sets represented in the dump directory in use during the IPCS session. It also produces an optional summary report of dumped storage by overriding certain SETDEF default keywords.
	LISTEDT	3.1	The LISTEDT subcommand displays information about various portions of the eligible device table.
	LPAMAP	3.1	The LPAMAP subcommand displays a map of the link pack area.
	NOTE	3.1	The NOTE subcommand directs messages to the IPSCPRNT data set, to the terminal, or to both. You may now specify that a table of contents entry is to be generated when the message associated with NOTE is routed to the print file.
	OPEN	3.1	The OPEN subcommand is updated to support the CHARS(DUMP) option that formats dense output for the IBM 3800.
	PROFILE	3.1	The PROFILE subcommand authorizes IPCS to stack or suppress stacking duplicate entries during the course of the current IPCS session and in all future IPCS sessions where the same dump directory is used.
	SELECT	3.1	The SELECT subcommand generates storage map records for the address spaces defined as CURRENT, ERROR, TCBERROR, or JOBLIST.

Category	Subcommand	Release	Description of Update
	SUMMARY	3.1	The SUMMARY subcommand displays or prints dump data associated with one or more specified address spaces. SUMMARY now provides functions previously provided by the VERBEXIT SUMMARY.
	VERBEXIT ALCWAIT	3.1	The VERBEXIT ALCWAIT subcommand displays a list of jobs waiting for devices.
	VERBEXIT CPUDATA	3.1	Deleted in 3.1. Its function is now part of the STATUS subcommand.
	VERBEXIT CVTMAP	3.1	Deleted in 3.1, the CVTMAP verb exit is replaced by the CBFORMAT CVT subcommand.
	VERBEXIT IOSDATA	3.1	Deleted in 3.1, the IOSDATA verb exit is replaced by the IOSCHECK subcommand.
	VERBEXIT RSMDATA	3.1	Deleted in 3.1, the RSMDATA verb exit is replaced by the RSMDATA subcommand.
	VERBEXIT SMSDATA	3.1	New for 3.1 and usable only if you have installed MVS/DFP Release 3.1 and activated the storage management subsystem, SMSDATA validates the control block chain and formats the control blocks and the trace table in the storage management subsystem address space. SMSDATA is intended for use in diagnosing problems with the storage management subsystem
	VERBEXIT SUMMARY	3.1	Deleted in 3.1, the SUMMARY verb exit is replaced by the SUMMARY subcommand.
	VLFDATA	3.1	New for 3.1, the VLFDATA subcommand displays diagnosis information for the VLF component.
	VERBEXIT TRACE	3.1	The VERBEXIT TRACE subcommand displays the program return trace entry, the system service trace entry, and the recovery trace entry.

IPCS Exit Services

Release 3.1 includes the following new and enhanced IPCS services for dump analysis and formatting:

Post-formatting exit routines
A new exit. The post-formatting exit routine allows you to create your own formatting routine for any type of structure that can be described by a PARMLIB data statement. IBM continues to supply specific exit routines for formatting ASCBs and TCBs.

Find exit routine
A new exit. The find exit routine associates a symbol with an AREA or a STRUCTURE in a dump.

Scan exit routine
A new exit. The scan exit routine checks the validity of an AREA or a STRUCTURE in a dump.

Name service
A new service. The name service translates:

* An STOKEN to an ASID, if the STOKEN represents an address space.

* An STOKEN to a data space name and owning ASID, if the STOKEN represents a data space.

* A real address of a data space ASTE to a data space name and owning ASID.

Select ASID service
The select ASID service provides support to update the IPCS storage map.

Storage map service
A new service. The storage map service checks the validity of areas, modules, and structures.

Symbol service
A new service. The symbol service stores definitions of IPCS symbols, the storage that they describe, and information about the validity of the areas, the modules, and the structures that they describe.

Control block formatter service
The control block formatter service provides support for IPCS models and formatters. It also allows invocation of post-formatting exits.

Exit control table (ECT) service
The ECT service supports general post-formatting exits.

Model processor service
The model processor service is updated to provide multiple source formatting, model linkages, flag field decoding, indentation, and array and row numbering suppression. It also supports DTYPE = ANY and DTYPE = QANY.

Get symbol service
The get symbol service provides additional support for FIND exits.

Print dump services

The following print dump services are now supported by IPCS.

- Storage access service
- Format service
- Print service
- Dump index service
- Summary dump data access service

The process for adding installation IPCS exits to SYS1.PARMLIB is changed, see *MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization.*

Exit Control Table (ECT)

In Release 3.1, you can define installation exits without changing the IBM-supplied SYS1.PARMLIB member BLSCECT. BLSCECT contains an IMBED statement for an optional member BLCSUSER. You can use BLSCUSER to identify PARMLIB members for the subsystems you have installed. (See *MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization* for information on identifying user exits in BLSCUSER).

SYS1.MIGLIB

In Release 3.1, a new system library, SYS1.MIGLIB, contains programs, including AMASPZAP and IPCS, that may be used to analyze data associated with Release 3.1 problems in a Version 2 environment[1] . For analysis performed in a Version 2 environment, a JOBLIB or STEPLIB DD statement must be used to access the Release 3.1 SYS1.MIGLIB data set.

SYS1.MIGLIB permits products independent of the BCP to add dump processing modules to those supplied with MVS/SP Version 3. (See *MVS/ESA System Generation* for details on the contents and generation of SYS1.MIGLIB).

Starting IPCS

As of Release 3.1, PRDMP no longer exists. You may use an IPCS cataloged procedure where a PRDMP cataloged procedure was used previously.

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[1] Version 2 has a special procedure that allows a SYS1.MIGLIB to be added to that system. There is no similar procedure available in Version 1.

PRDMP to IPCS Conversion Summary

To use the IPCS dialog, you need ISPF Version 2 Release 2. To use IPCS interactively, you need TSO/E Release 2 or a subsequent release. IPCS also works in batch mode to provide the hardcopy output that PRDMP previously provided. To obtain a hardcopy dump using IPCS without TSO/E, see *MVS/ESA Interactive Problem Control System (IPCS) Planning and Customization.*

The following table describes the control statements or functions formerly available through PRDMP, and points to the equivalent IPCS subcommand or function. For more information about IPCS subcommands, services, and exits, see *MVS/ESA Interactive Problem Control System (IPCS) Users Guide* and *MVS/ESA Interactive Problem Control System (IPCS) Command Reference.*

PRDMP Control Statement or Function	IPCS Equivalent
ASMDATA control statement	ASMDATA verb exit • Use VERBEXIT ASMDATA to format certain ASM control blocks.
AVMDATA control statement	AVMDATA verb exit • Use VERBEXIT AVMDATA to format the contents of accessible availability manager control blocks.
CPUDATA control statement	STATUS subcommand • Use the STATUS subcommand to gather processor-related debugging information.
CVT control statement	EQUATE subcommand • Use EQUATE CVT address when you want to associate the address of the CVT control block with a symbol.
CVTMAP control statement	CBFORMAT subcommand • Use the CBFORMAT subcommand to display the contents of the CVT control block.
DAEDATA control statement	DAEDATA verb exit • Use VERBEXIT DAEDATA to format DAE dump data.
dumped storage summary	LISTDUMP subcommand • Use the LISTDUMP subcommand to provide a summary of the storage in one or more dumps.

PRDMP Control Statement or Function	IPCS Equivalent

EDIT control statement	GTFTRACE subcommand
	
	• Use the GTFTRACE subcommand to format GTF trace records in a dump or in a separate GTF trace file. The following incompatibilities are a result of the conversion from PRDMP to IPCS:
	  — Equal signs in print dump are replaced by parentheses in IPCS.
	  — There are limits on the number of values that can be entered for a given list.
	  — START and STOP times now also apply to blocks of records in dumps.

END control statement	END subcommand • Use the END subcommand to terminate an IPCS session, subcommand processing, and CLIST processing.
FORMAT control statement	SUMMARY subcommand • Use the SUMMARY subcommand with the FORMAT keyword to format major control blocks.
GO control statement	Execute a CLIST of IPCS subcommands • Use a CLIST to execute a series of predefined IPCS subcommands against a source data set. Use the subcommand descriptions to help you determine which subcommands you want to execute.
GRSTRACE control statement (also QCBTRACE or Q)	VERBEXIT GRSTRACE subcommand • Use the GRSTRACE and QCBTRACE or Q verb names on the VERBEXIT subcommand to format the address of the major control blocks associated with global resource serialization, and the contents of control blocks on the global resources queue.
INDEX DD statement	IPCSTOC data set • Allocate an IPCSTOC data set to capture the entries made by the IPCS TOC service. The service makes an entry in this data set whenever a subcommand is issued with the PRINT keyword.
IOSDATA control statement	IOSCHECK subcommand • Use the IOSCHECK subcommand to format the contents of specific I/O supervisor (IOS) control blocks and related diagnostic information.

PRDMP Control Statement or Function	IPCS Equivalent
JES2 control statement	VERBEXIT JES2 subcommand • Use the VERBEXIT JES2 subcommand to format control blocks associated with JES2. • JES2 dump formatting is described in *MVS/ESA JES2 Logic*.
JES3 control statement	VERBEXIT JES3 subcommand • Use the VERBEXIT JES3 subcommand to format control blocks associated with JES3. • JES3 dump formatting is described in *MVS/ESA JES3 Diagnosis*.
LOGDATA control statement	VERBEXIT LOGDATA subcommand • Use the VERBEXIT LOGDATA subcommand to format the in-storage LOGREC buffer records.
LPAMAP control statement	LPAMAP subcommand • Use the LPAMAP subcommand to format information about the pageable link pack area (PLPA) and active LPA.
MTRACE control statement	VERBEXIT MTRACE subcommand • Use the MTRACE verb name on the VERBEXIT subcommand to format the master trace table.
NEWDUMP control statement NEWTAPE control statement	SETDEF subcommand • Use the SETDEF keywords for data set source specification to alter the source you want to use for dump processing.
NUCMAP control statement	VERBEXIT NUCMAP subcommand • Use the NUCMAP verb name on the VERBEXIT subcommand to format the modules in the nucleus at the time of the dump.
ONGO control statement	Create a CLIST of IPCS subcommands • Create a CLIST to execute a predefined series of IPCS subcommands. • Use the subcommand descriptions to help you determine which subcommands you want to execute.
PRDMP PRINTER DD statement	IPCSPRNT DD statement
PRDMP SYSPRINT DD statement	SYSTSPRT DD statement
PRDMP SYSIN DD statement	SYSTSIN DD statement

PRDMP Control Statement or Function	IPCS Equivalent
PRINT CSA, SQA, NUCLEUS control statements	LIST subcommand and CLISTs • Use these symbols on the LIST subcommand to format and display information for the CSA, SQA, and NUCLEUS: **CSA, ECSA** CSA storage above and below 16 megabytes. **SQA, ESQA** SQA storage above and below 16 megabytes. **NUCLEUS** **ENUCLEUS** **RONUCLEUS** **DATOFFNUCLEUS** Read/write nucleus storage below and above 16 megabytes; read-only nucleus storage; the DAT-OFF portion of the nucleus. **PRIVATE, PRIVATEX** Private area below and above 16 megabytes. • Use the BLSCPCSA, BLSCPNUC, BLSCPRIV, and BLSCPSQA CLISTs to print information from these system areas.
PRINT STORAGE, REAL control statements	LIST subcommand • Use the LIST subcommand to display real storage dump data.
PRINT CURRENT,JOBNAME control statements	BLSCPRNT CLIST • Use the BLSCPRNT CLIST to gather address space selection information and generate storage map entries defining the address spaces in a dump. BLSCPRNT executes several IPCS subcommands. Among them are: EVALMAP, LIST, LISTMAP, SELECT, and SUMMARY.
Q or QCBTRACE control statements	See GRSTRACE control statement.
RSMDATA control statement	RSMDATA subcommand • Use the RSMDATA subcommand to format information about the real storage management component.
SADMPMSG control statement	VERBEXIT SADMPMSG subcommand • Use the SADMPMSG verb name of the VERBEXIT subcommand to format the SADMP execution-time virtual storage dump message log.

PRDMP Control Statement or Function	IPCS Equivalent
SEGTAB control statement	EQUATE subcommand • Use the SGT symbol with an address on the EQUATE subcommand to associate the segment table with its address and storage attributes.
SRMDATA control statement	VERBEXIT SRMDATA subcommand • Use the SRMDATA verb name on the VERBEXIT subcommand to format certain control blocks associated with the system resources manager component.
SUMDUMP control statement	VERBEXIT SUMDUMP subcommand • Use the SUMDUMP verb name on the VERBEXIT subcommand to format the summary dump data provided by SVC dumps.
SUMMARY control statement	SUMMARY subcommand • Use the SUMMARY subcommand to display or print dump data associated with an address space. **Note:** SUMMARY does not produce the dumped storage summary that the SUMMARY JOBSUMMARY control statement produced. If you want this summary, use the LISTDUMP subcommand.
TITLE control statement	OPEN subcommand • Use the TITLE keyword on the OPEN subcommand to specify a title you want to appear on each page of the IPCS print file.
TCAMMAP control statement	VERBEXIT TCAMMAP subcommand • Use the TCAMMAP verb name on the VERBEXIT subcommand to format information for ACF/TCAM problem determination. • See *ACF/TCAM Diagnosis Guide*.
TRACE control statement	VERBEXIT TRACE subcommand • Use the TRACE verb name on the VERBEXIT subcommand to format trace entries for all address spaces.
VSMDATA control statement	VERBEXIT VSMDATA subcommand • Use the VSMDATA verb name on the VERBEXIT subcommand to format and print the contents of certain VSM control blocks.

PRDMP Control Statement or Function	IPCS Equivalent
VTAMMAP control statement	VERBEXIT VTAMMAP subcommand
	• Use the VTAMMAP verb name on the VERBEXIT subcommand to format ACF/VTAM control blocks helpful to ACF/VTAM problem determination. • See *ACF/VTAM Diagnosis Guide*.

Sample of JCL for Printing Dumps from IPCS

The following JCL prints a dump, using IPCS, from the system dump dataset.

```
//SUMDUMP JOB
//S EXEC PGM=IKJEFT01,DYNAMNBR=20,REGION=1500K
//DUMP DD DSN=SYS1.DUMP02,DISP=SHR
//SYSPROC DD DSN=SYS1.SBLSCLI0,DISP=SHR
//SYSTSPRT DD SYSOUT=A
//SYSDUMP DD SYSOUT=A
//SYSTSIN DD *
 PROFILE MSGID
 %BLSCDDIR VOLUME (vsampk)
 ALLOCATE FILE(IPCSDDIR) REUSE DSNAM('SYS1.DDIR') SHR
 IPCS NOPARM
 SETDEF DSN('SYS1.DUMP02') SHR
 IPCS NOPARM
 SETDEF DSN('SYS1.DUMP02') NOCONFIRM
 VERBEXIT SUMDUMP
/*
```

Notes:

1. vsampk is any VSAM volume.

2. You may also replace VERBEXIT SUMDUMP with SUMMARY FORMAT, %BLSCBSVB, or another option.

Component Trace

In Release 3.1, component trace is a new function that controls the collection of trace data. The CTRACE macro connects an MVS component or a user application to component trace. The MVS operator commands TRACE CT and REPLY activate and deactivate the tracing. The DISPLAY TRACE command shows the status of the component or user application. To format and display the trace information, use the IPCS subcommand CTRACE. When the component or user application terminates, the CTRACE macro should be used in termination processing to disconnect the component from the component trace.

Using the START CTRACE and STOP CTRACE commands, you can turn component traces for LLA, RSM, and VLF on and off. For more information about using component trace, see the CTRACE macro in *MVS/ESA SPL: Application Development Macro Reference* and the associated commands in *MVS/ESA Operations: System Commands*.

For information on how to create a component trace for your applications, see *MVS/ESA SPL: Application Development Guide*.

GTF Trace

Prior to Release 3.1, the EDIT verb of PRDMP formatted GTF trace data. In Release 3.1, the IPCS subcommand GTFTRACE formats GTF trace data. There are new GTF records for Release 3.1.

Chapter 7. Accounting

This chapter describes Release 3.1 changes that might affect existing accounting programs. See the *MVS/ESA System Programming Library: System Management Facilities (SMF)* for a complete list of SMF records and subtypes and how to use them.

Summary of SMF Records

The following chart summarizes the changes to SMF records for Release 3.1.

SMF Record	Release	Description of Update
Type 6	3.1	Type 6 is updated incompatibly to contain an eight character field for a JES3 job ID, which will appear in the field starting in JES3 SP3.1.1.
Type 30 (Common Address Space Work Record)	3.1	Type 30 contains a terminal symbolic name for TSO/E. and the data space "high water" for a job step.
Type 34 (TSO Step Termination)	3.1	Type 34 contains a terminal symbolic name for TSO/E.
Type 35 (TSO Job Termination)	3.1	Type 35 contains a terminal symbolic name for TSO/E.
Type 41	3.1	The type 41 record contains information about the real storage manager. Also, the I/O data values will be different if you use the LOCVIEW keyword on the ACCESS parameter of the DIV macro instruction. The type 41 record contains the name of the job.
Type 57	3.1	Type 57 is updated incompatibly to contain an eight character field for a JES3 job ID, which will appear in the field starting in JES3 SP3.1.1.
Type 70-79	3.1	SMF records 74, 75, and 79 now report the number of current allocations in place of the number of data sets open for each DASD volume. In addition, the storage group name for each device being measured appears in the type 74 record and in the subtype 9 section of the type 79 record. Types 71, 72, and 79 are affected by new RMF measurements.
Type 84	3.1	SMF record 84 contains JES system information starting in JES SP3.1.1.

Chapter 8. Measurement and Tuning

This chapter describes Release 3.1 changes that affect system performance and ways of measuring that performance. However, because actual system performance results from the interaction of many factors, the topics in this chapter cannot be considered independently of other changes in Release 3.1. Be sure to review the information in other chapters of this book and read the Release 3.1 discussions in *MVS/ESA SPL: Initialization and Tuning* as well.

Effect of PAGEDEL Command on Swap and Page Datasets

In Release 3.1, during execution of the PAGEDEL command, system performance might degrade while data is being migrated from one page and/or swap data set to another page and/or swap data set. Migration adds to the paging and swapping work load. You need to keep the total amount of remaining paging space adequate for the system's level of activity.

VIO performance might be significantly degraded during PAGEDEL execution.

Chapter 9. Coexistence Considerations

Coexistence refers to running a combination of MVS/370, MVS/XA, and MVS/ESA or running different levels of MVS/ESA in a processor complex. Installations maintain coexistence because they:

- Have processors that support only specific architectures
- Must use one type of operating system as backup for the other

Whether you can run a combination of MVS/370, MVS/XA, and MVS/ESA depends on the JES level you intend to use:

- If you are using JES3 at a 1.3.4 level, or JES2 at a 1.3.6 level, MVS/370, MVS/XA, and MVS/ESA can exist in the same processor complex.

- If you are using JES3 at a 2.2.1 level, or JES2 at a 2.1.5 level or 2.2.0 level, MVS/XA and MVS/ESA can exist in the same processor complex.

- If you are using a JES 3.1.1 level or above, MVS/370, MVS/XA, and MVS/ESA cannot be run in the same processor complex.

For compatible JES and BCP levels, see "The JES2 Component of MVS/ESA" on page 1-4 and "The JES3 Component of MVS/ESA" on page 1-5.

Most installations will maintain some form of coexistence during the migration period. Whether your installation can do this depends on the JES level that is installed. Many installations will continue to run both operating systems for some time after MVS/ESA is established as a production system.

If the appropriate levels of JES are used, MVS/370, MVS/XA, and MVS/ESA can coexist either as independent operating systems running on different processors, as independent operating systems that alternately run on the same processor, or as loosely-coupled operating systems.

In all types of coexistence, the major objectives are to:

- Maintain programs that can run on either system.

- In some cases, ensure that the different systems can run one another's workloads in back-up situations.

When MVS/XA, MVS/370, and MVS/ESA systems are loosely-coupled, installations have some additional considerations, including:

- Ensuring that jobs that must run on a particular system are routed to that system

- Determining which data sets can be shared

- Reviewing JES3 dynamic system interchange (DSI) procedures

Notes:

1. Further coexistence considerations exist for installations running more than one release of JES2 or JES3 in the same processor complex. See Figure 1-2 on page 1-4, Figure 1-3 on page 1-5 and the *JES3 Conversion Notebook* for an explanation of JES coexistence considerations.

2. Coexistence considerations also exist for installations planning to use the Storage Management Subsystem. See the MVS/DFP library.

EOV and MODE = 31

If MODE = 31 is coded on the EOV macro, the program will execute only on MVS/DFP Version 2 Release 3.0 or later. Do not code MODE = 31 on the EOV macro if the program must execute on earlier levels of MVS/XA DFP or in any other environment that does not include EOV MODE = 31.

OPEN and CLOSE Requirement for Assembler H Version 2

MVS/DFP Version 2 Release 3.0, introduces an additional situation requiring the use of Assembler H Version 2. As of this release, the use of either the OPEN or CLOSE macro requires, by default, the use of Assembler H Version 2.

Beginning with MVS/DFP Version 2 Release 3.0, both OPEN and CLOSE test the SPLEVEL SET value when they are expanded:

• If SPLEVEL SET = 2 is coded (the default for SPLEVEL), the macro expansions for both OPEN and CLOSE generate a BAS instruction. The BAS instruction requires assembly with Assembler H Version 2.

• IF SPLEVEL SET = 1 is coded, the macro expansions for both OPEN and CLOSE generate a BAL instruction. The BAL instruction does not require assembly with Assembler H Version 2.

Note: Some, but not all, of the processors that support MVS/370 also support the BAS instruction.

OPEN and CLOSE and MODE = 31

If MODE = 31 is coded on either the OPEN or CLOSE macros, the expansions of the macros will contain a long form of the parameter list passed to OPEN or CLOSE, and the programs will execute only on MVS/DFP Version 2 Release 3.0 or a later release. In addition, MODE = 31 is appropriate only when the SET value is 2. The system treats the combination of a SET value of 1 and either OPEN MODE = 31 or CLOSE MODE = 31 as an error.

Standalone Dump (SADMP)

The mapping of standalone dump records is updated incompatibly because of improvements to the system. The dump record has increased from 4104 bytes to 4160 bytes. You must reassemble AMDSADMP for a standalone dump to work correctly in Release 3.1.

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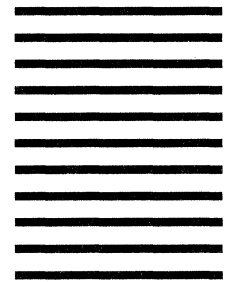Reader's Comment Form

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