IBM z/VSE
4.3

Preparing a Product for VSE

SC33-8424-02

Note

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

Edition Notice

This edition applies to Version 4 Release 3 of IBM® z/Virtual Storage Extended (z/VSE®), Program Number 5609-ZV4, and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC33-8424-01.

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Accessibility

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

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

Using Assistive Technologies

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

Documentation Format

The publications for this product are in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when you use the PDF files and want to request a web-based format for a publication, you can either write an email to s390id@de.ibm.com, or use the Reader Comment Form in the back of this publication or direct your mail to the following address:

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About This Book

The purpose of this book is to further improve the satisfaction of VSE customers by facilitating a homogeneous, convenient and easy to install/easy-to-use program environment.

VSE is a package product with a particular structure and requirements customers are used to. Software vendors and IBM product developers who intend to provide programs to be installed and run under VSE should be familiar with the VSE environment. This will let their programs fit into the VSE environment and help meet customers' expectations.

Although almost all information provided herein is available from various other IBM sources (manuals and licensed materials), such sources are not always at hand and do not focus necessarily on those areas that may be of particular interest from a vendor's perspective. Therefore, this book shall serve as a selective, comprehensive and handy compilation of such relevant information. However, it is not intended to modify or replace the primary source referenced herein in any respect. In case of any doubt or ambiguity the primary source shall be used.

It remains solely vendors' business decision and responsibility if and to what extent their product implementation follows the structures described in this book. Of course, IBM must reserve the right to make changes according to its business judgement and needs.

IBM is interested in further improving this book. Readers who want to provide comments or suggestions are kindly asked to use the Reader's Comments Form enclosed.

VSE versions considered
The book takes into account all current versions of VSE.

Who Should Use This Book

This manual is intended for software vendors and IBM product developers who provide programs to be installed and run under z/VSE.

How to Use This Book

The following list tells where you find information on the various topics in this book:

Part 1. IBM Contact Points

Chapter 1, “IBM Communication Channels for Software Vendors,” on page 3
describes the various channels through which IBM offers support to vendors.

Part 2. Programming Interfaces

Chapter 2, “Overview,” on page 9
tells which programming interfaces IBM recommends for use.

Chapter 3, “Macros and Vendor Exits,” on page 11
describes the programming interfaces that IBM offers to vendors and how to use them.

Part 3. Documentation and Multicultural Support

Chapter 4, “VSE Customer Documentation,” on page 63
describes how to design user-friendly software publications.

Chapter 5, “Providing Multicultural Support,” on page 65
describes what to consider when designing software for users speaking many different languages and conforming to different cultural conventions.

Part 4. Creating Installation Tapes and Servicing Your Product

Chapter 6, “VSE Product Numbering Conventions,” on page 71
explains the IBM VSE product numbering conventions to avoid numbering conflicts at customer installations.

Chapter 7, “Creating Installation Tapes,” on page 77
describes how to prepare a product distribution tape.

Chapter 8, “Installing and Customizing Your Product,” on page 89
tells how to install a product from the distribution tape and customize it thereafter.

Chapter 9, “Providing Service,” on page 95
describes how a product is serviced.

Part 5. Packaging and Service Samples

Chapter 10, “Packaging of Products,” on page 107
presents sample job streams for packaging products.

Chapter 11, “Library Member Types,” on page 119
lists the member types allocated for specific use.

Chapter 12, “APAR Fix (ZAP),” on page 121
gives an example of a ZAP.

Chapter 13, “Programming Temporary Fix (PTF),” on page 123
gives Program Temporary Fix (PTF) examples.

Chapter 14, “Shipping PC Code with VSE,” on page 131
gives a sample of how to ship PC code with VSE.

Chapter 15, “Job for Customizing,” on page 133
gives a sample of a customizing job.

Additional help is provided at the end of the book:

The glossary
explains technical terms used in the book.

The index
helps you to locate information.

Where to Find More Information

z/VSE IBM Documentation

IBM Documentation is the new home for IBM's technical information. The z/VSE IBM Documentation can be found here:

https://www.ibm.com/docs/en/zvse/6.2

You can also find VSE user examples (in zipped format) at

https://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/zVSE_Samples.pdf

Summary of Changes

This manual has been updated to reflect enhancements and changes that are implemented with z/VSE Version 4 Release 3:

- New communication channels for software vendors. Please refer to Chapter 1, “IBM Communication Channels for Software Vendors,” on page 3.

Part 1. IBM Contact Points

Chapter 1. IBM Communication Channels for Software Vendors

This chapter describes the channels through which IBM currently works with vendors:

- The IBM Partner World
- The Early Test Program established especially for vendors to test and verify their applications at an early stage with the most current version of IBM software
- The National Solution Center Database, which describes literally thousands of software programs from IBM and from vendors to IBM sales personnel

z/VSE Information for Partners

Independent Software Vendors and Business Partners information:
https://www.ibm.com/docs/en/zvse/6.2

Information about service and support, and also useful information for IBM Business Partners is provided at:
https://www.ibm.com/docs/en/zvse/6.2?topic=pdf-library

General z/VSE contact:
https://www.ibm.com/docs/en/zvse/6.2

General IBM contact:
http://www.ibm.com/contact/us/

The IBM PartnerWorld

The IBM PartnerWorld® program is available for the companies who develop commercially marketed software, like Independent Software Vendors (ISV), either on z/VSE, z/VM®, z/OS® or across the System z® platforms. The program benefits its members by assisting them in obtaining the resources necessary to develop and support diverse customer solutions across IBM's System z platforms. The offerings available through the PartnerWorld help you build and market solutions to meet your customers' needs. IBM's experts provide members of the PartnerWorld with support at every step of software creation cycle – from the first encounter with the customer to post-sales support.

IBM PartnerWorld membership is at no cost. To join the program, you must sign the PartnerWorld Agreement.

IBM PartnerWorld and Independent Software Vendors

The IBM PartnerWorld page:
http://www.ibm.com/partnerworld/pwhome.nsf/weblook/index_us.html

Independent Software Vendors (ISV) page
:https://www-01.ibm.com/support/docview.wss?uid=nas8N1022046

Early Test Program (ETP)

The Early Test Program provides software vendors with selected pre-General Availability (pre-GA) IBM products.

These Early Test Programs are open to all software vendors who wish to test their software for the purpose of porting, migrating, or regression testing their software in the new pre-GA environment. This provides software vendors with the opportunity to offer their products with a general availability that coincides with IBM products.

Further Information

Selected programs will be made available as new product releases are announced, along with the currently available programs. The Early Test Program is conducted by the IBM Laboratory in Boeblingen, Germany.

Contact

vse@de.ibm.com

National Solution Center Database

IBM's National Solution Center Database is a constantly updated list of many applications, solutions, customer references, as well as IBM and non-IBM information representing over 15,000 solutions from IBM and vendors.

The database is available on IBM networks for IBM SEs and Marketing Representatives world-wide.

To get a listing of the software products and other information about any company that is currently listed on IBM's National Solution Center Database, or to get application forms to become part of the database, contact your local IBM Office or use:

National Solution Center Database

http://www.ibm.com/systems/z/solutions/index.html

https://www.ibm.com/products/software

Example

Following is an example of an application description entered into the database and thus made available to IBM sales personnel:

DOCID
X73321

TITLE
Accounts Receivable

SYSTYPE
9370, 43XX, 30XX, ES/9000

SYSREQ
z/VSE, z/OS with COBOL, CICS®

VENDTYPE
IAS Authorized Industry Application Specialist

VENDOR

```
John Smith
100 E 100 St
New York, NY 100001
CONTACT   : Sue Smith
PHONE     : 212-555-5555
```

DESCRIPT
John Smith's Accounts Receivable System is an online, real-time, credit management system. The standard system provides the functions and features needed to support cash application for trade receivables and maintain real-time customer account information. A credit data base allows for extensive online inquiry of customer information, detail open item and mass open item payment selection. Credit management is optimized through online, real-time access to account data for maximum control of receivables. Combining John Smith's Accounts Receivable and Customer Order Processing Systems provides the greatest possible control of your company's receivables and credit exposure, while utilizing a common customer file and credit data.

Available options include automatic cash application, online help, extended credit checking, multi currency, automated credit agency interchange, capabilities for special order pricing, order consolidation, production and assembly orders, deals and promotional pricing, vendor-direct shipments, customer-entered orders, and Electronic Data Interchange (EDI) compatibility.

END USER DEFINITION:

Growth Accounts
Departmental Systems
Enterprise End User Systems
Large Data Center System

REVDATE
09/04/90

INSTCUST
10 - 24

REFER
Contact vendor for references

IBMOFFIC
xxx xxxx xxxx

IBMPHONE
xxx xxxx xxxx

SUPPORT
At John Smith's, planning and installation of the applications system is a joint effort between John Smith's and the client. Implementation Assistance services provided include project planning and management, organization and detailing of project tasks, interface design and programming, data conversion assistance, specialized training programs, and onsite technical support. The Custom Package Modification services include design and specification preparation, programming, documentation preparation, and implementation. Once Implementation is complete, John Smith's Telephone Support Center provides 24-hour, year-round assistance. These services are provided at no additional charge as part of the standard six-month warranty; thereafter, with John Smith's Maintenance Agreement. Additionally, John Smith's provides separate training for user and system personnel. The instruction format is a combination of lecture and hands-on student interaction with the system(s). John Smith's consulting staff provides services beyond the data processing environment. Typical services might include assistance in defining a customer's needs, testing with customer data to provide insight into a system's potential, pre-installation planning and ongoing consulting to improve the utilization or effectiveness of the installed systems. Finally, John Smith's Services Division can help you extend the capabilities of our standard software to address your special requirements, whether they include extensive implementation support, project management, or customized enhancements.

```
           COMMENTS
                Software available for cross-license              N
                Code available outside the United States          Y
                Marketing brochures available                     Y
                Demo available                                    Y
                Response line available                           Y
                Education available                               Y
                Defect correction available                       Y
                Modification/enhancement support                  Y
                Multi-licensing agreement                         Y
                Application copy protected                        N
```

CUSTRESP

```
*********************************************************************
* This description is based upon information obtained from the      *
* vendor, and is provided without independent evaluation or         *
* validation by IBM.  IBM, therefore, cannot ensure the accuracy    *
* of statements as to the functions, quality, or performance of the *
* vendor's offering and makes no warranties, expressed or implied,  *
* concerning the offering.                                          *
* You should contact the vendor for current information, including  *
```

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* prices, terms, and conditions.                                *
*****************************************************************
```

HARDWARE

John Smith application software products operate on all zSeries processors. The exact configuration of processor, DASD, and terminals depends on the volume of business transactions to be processed. Please contact John Smith for more information.

This offering is supported on the 9371 processor.

SOFTWARE

John Smith application software products are supported in the following system software environments:

Operating Systems

z/VSE, z/OS

TP Monitor

CICS

Data Storage

VSAM, IMS/DB, DL/1, DB2®, SQL/DS

Compiler

COBOL

Utilities

Sort/Merge

SAA

Uses SAA elements

YES

APPLICATION STRUCTURE

Stand-alone, Host with Non-programmable Workstation (NWS), Cooperative, Host with Programmable Workstation

COMMON USER ACCESS (CUA)

CUA 1989, Advanced Interface Design Guide, Graphical

ENVIRONMENT

OS/2 EE, z/OS, CICS

COMMON PROGRAMMING INTERFACE (CPI)

Communications, Database, Presentation

COMMON COMMUNICATIONS SUPPORT (CCS)

3270 DS, SNA Network Management, LU 6.2, Token Ring, X.25

Note: This product has been selected for inclusion in IBM's SAA catalog. For current information regarding SAA compliance, contact the vendor.

PRICE

Contact vendor for prices.

TERMS

A 99-year lease is standard for all John Smith products. Further, John Smith, Inc. grants a nontransferable and nonexclusive license to use the System to process the data of the division described in the Agreement. Upon the effective date of this Agreement, customers are invoiced 90% of the license fee, with payment due within 10 days. Included in the license fee is a six-month warranty that includes confirmation and correction of errors, and provisions for updates that are necessary for the System to continue to accomplish its principal functions. Additionally, John Soft, Inc. owns the rights to the software and guarantees that the software performs in accordance with the specification contained in the user and system documentation.

CURDESC

Document has been reviewed by the vendor within the last year.

Part 2. Programming Interfaces

Chapter 2. Overview

This chapter describes the different classes of interfaces to be considered when attaching a program to VSE and the problems arising from using attachments that are not IBM programming interfaces.

IBM Programming Interfaces

Only IBM Programming Interfaces are designed and officially released by IBM for the purpose of attachment. They are identified explicitly within the respective program manual belonging to the VSE System Reference Library.

In general, reasonable business considerations are taken to avoid changes that could affect user programs.

Other Attachments

Some vendors have attached their programs by using VSE source code or information from the IBM Diagnosis Reference manuals. These are **not** IBM programming interfaces designed and released for attachment. In addition, IBM advises against this attachment practice due to the following technical reasons:

- Source code is subject to constant change in the course of technical development. Thus, even a simple fix may render the attached program inoperative, not to mention the effect of numerous changes in new releases.
- In contrast to the programming interfaces described in the VSE Reference Library, the information given in the Diagnosis Reference library is intended for diagnosis purposes **only**, that is to assist users in identifying and solving certain technical problems that may be encountered in the VSE environment; they are n o t intended for attachment.

  The macros documented in the Diagnosis Reference Manuals, for example macros developed for VSE/Advanced Functions, are:

  – Not documented as intended programming interfaces for customer use.
  – Not checked by VSE for interface use at the time of invocation. VSE assumes that the calling program comes in at the correct point in time providing the correct parameters.
  – Sometimes restricted in use in order to provide specific functions. If used otherwise, results are unpredictable.

Specifically, IBM discourages using a certain code sequence within the supervisor for attachment. Such use is even more critical when compared to the use of VSE/Advanced Functions' internal macros; those are intended to remain upward compatible whenever possible.

It must be clearly understood that problems resulting from such kinds of attachment are not within IBM's responsibility and are **not** solved by IBM.

Support of Multiple VSE Releases

Assume that you have an application that is running on different releases of VSE and it is accessing VSE control blocks directly. Assume also that a new release of VSE provides a programming interface that enables you to replace the old one. If this applies to your environment, then the application can make use of the new interface for the new VSE release and later ones, and still continue to run on the previous releases of VSE.

To allow for both kind of interfaces to coexist in your application, follow these steps:

1. Use the macro SUBSID INQUIRY to determine the level of VSE the program is running on. For a description of this macro, please see z/VSE System Macros Reference.

2. If the program runs on an older release of VSE that does not yet supply this interface, branch to the old code.
3. If the program is on the level of VSE providing this new interface, use the new interface at the highest possible level.

Vendor Support

IBM suggests that you make use of the following options for help regarding programming interfaces:

1. Use the normal channels to submit your requirement for a programming interface to IBM: the user groups at GUIDE, COMMON, or your local IBM representative. IBM will evaluate if those interfaces can be made available.
2. Make use of the Early Test Program to check out your program early. There you also have access to the supervisor lists and can acquaint yourself with changes. See “Early Test Program (ETP)” on page 3 for detailed information on the Early Test Program.

Chapter 3. Macros and Vendor Exits

Vendors can attach their applications to VSE using the officially supported interfaces, for example, the macros and the vendor exits. Using these interfaces, the vendor applications and z/VSE can communicate well, and this results in less work for testing vendor applications, and less effort for problem determination.

The official interfaces also increase the flexibility of IBM software development: IBM can improve things "below" these interfaces without having to be concerned about an impact on a vendor application.

Note: This chapter contains Programming Interface Information and is an extract from the z/VSE V6R2 Supervisor Diagnosis Reference. There is no guarantee for the accuracy of this extract and APARs concerning it are not acceptable. For details please refer to the named manual.

PRODID Macro - Accessing VSE Services

The PRODID macro allows software vendor programs to identify themselves to a VSE system and access authorized VSE services. Moreover, the macro allows to check which programs are already initialized in the system. Thus, one can check, for example, if an incompatible program is initialized.

An 8-byte token communicates the authorization. A job receives the token at DEFINE. The token becomes invalid at the deletion time, which is either through issuing PRODID DELETE or through the system shutdown.

The PRODID macro consists of the following five services:

- PRODID DEFINE to define your program to the system
- PRODID DSECT to get a description of the input and output of PRODID DEFINE and PRODID CHECK
- PRODID AUTH to obtain rights to use VSE services
- PRODID CHECK to search for products
- PRODID DELETE to cancel service access

For an example of how to use the PRODID macro in your program, see “Example of PRODID” on page 18.

PRODID DEFINE Service

The service is contained in the initialization routine of your program and notifies the system. PRODID DEFINE sends the program's "visiting card" to the system, which then honors the card with a token. The information on the visiting card, later on called notification entry, is kept by the system until it is removed by the program. The notification entries in the dump of the SVA help Service organizations to analyze a memory dump and identify those programs that might be involved in a certain problem.

The token given to the program functions as a key that enables the program to use a list of services. As a key to a room may be lent to other people, this token may be passed from a program to routines executing under a different program but supported by the token owner. For example, consider a program that supplies a particular access method to other programs. The access method is initialized in its partition, obtains the token, and deposits it in an area shared with the supported programs. Then the token is used whenever the routines of the access method (working for a supported program) need to be enabled for use of a service, or disabled again if no longer needed.

Prerequisites

In order to start a program that issues the DEFINE instruction, the following points should be considered:

- Users must have update right for the IJBVEND phase residing in IJSYSRS.SYSLIB. The phase IJBVEND is the part of the supervisor processing the PRODID request. Thus, the system administrator must have

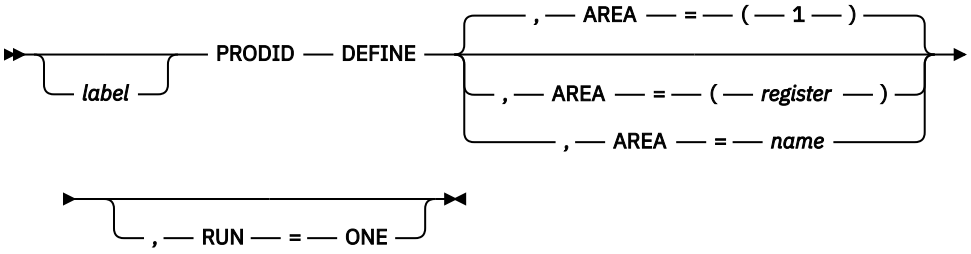
defined the user ID and the right in DTSECTAB. For information on how to update the DTSECTAB, see "Protecting Data" in the manual z/VSE Guide to System Functions.

- The PRODID DEFINE service must be issued while the program is running in its own partition.

The token is deleted as the result of an explicit PRODID DELETE request or system shutdown, not with any end-of-task or end-of-job processing.

Requirements for the caller

- Authorization: controlled by Access Control Facility
- AMODE: 24 or 31
- RMODE: 24 or ANY
- ASC-mode: Primary



Input Parameter Description

AREA
points to an area where the input information is available. The area can be specified in register notation (the default is 1) or as the name of the input area.

The area must be in an address range valid for this job.

The input for PRODID DEFINE, the text of the "visiting card" is a string described by the PRODID DSECT service. This input should be in character format so that no conversion are needed for printing the string. The input is accepted as passed along, except it must not be empty; that is, none of the three fields IJBCOMPN, IJBPRODN, IJBVRM can be binary zero. In such a case the request would be rejected and a return code issued.

The fields for identifying the company, the product, and the release level should contain the following information:

IJBCOMPN
The name of the company owning the product and issuing the DEFINE request. Only *one* meaningful abbreviation should be used for all products of a company.

IJBPRODN
The name of the product. Only *one* meaningful abbreviation should be used for all different releases of a product.

IJBVRM
The version, release, and modification level of the program.

The information in these fields may have a different length than the one specified by the DSECT. It may, however, not use more than the combined length of the fields IJBCOMPN to IJBVRM. For example: say you would want to indicate a release level that requires more than the 6 bytes allotted to IJBVRM. In this case, the release level must start somewhere in IJBPRODN so its end coincides with the end of IJBVRM.

Note: The CHECK function does not support such overflowing information, but treats, for example, the field IJBCOMPN as containing the company name and nothing else.

RUN=ONE
The program runs only once per system as, for example, VSE/POWER.

Output

is an 8 byte token returned in the input area at label IJBTOKEN. Note that the token is associated with the input string, not with a task or partition.

On return, the contents of register 0 is destroyed.

Return Codes

returned in register 15

0
The system accepted the input and returned a token.

4
The same string is already defined for the system or partition, the same token was returned as previously.

8
Maximum of 256 products already defined.

12
Control block format error. At least one of the fields identifying company, product, or release level is binary zero, or IJBVIDL is incorrect.

16
IJBVEND not loaded.

20
GETVIS error, return code from GETVIS in register 0.

Cancel Conditions

X'0B'
Security check failed

X'21'
An unknown function code is passed to PRODID (corrupted macro expansion).

X'25'
Invalid address of parameter list or parameter

PRODID DSECT Service

This service generates a DSECT describing:

- Input expected by PRODID DEFINE
- Output returned by PRODID DEFINE
- Input expected by PRODID CHECK.
- Output returned by PRODID CHECK.

For information of the value of these fields, see page “AREA” on page 12 and “PRODID CHECK Service” on page 16.

The layout is:

Table 1. PRODID Parameter List

Field Name	Description	Field Type Length
IJBVIDL	LENGTH OF INPUT AREA	AL2(IJBFINST)
IJBVIFL1	FLAGBYTE, RESERVED	CL1
IJBVIFL2	FLAGBYTE, RESERVED	CL1

Table 1. PRODID Parameter List (continued)		
Field Name	**Description**	**Field Type Length**
IJBCOMPN	NAME OF COMPANY, PROGRAM OWNER	CL14
IJBPRODN	NAME OF PROGRAM	CL16
IJBVRM	VERSION AND RELEASE OF PROGRAM	CL6
IJBTOKEN	TOKEN RETURNED BY DEFINE	CL8
IJBCKLEN	LENGTH OF OUTPUT AREA FOR CHECK	CL2
IJBFINST	IJBVIDL	*
IJBCKARE	BEGIN OF OUTPUT AREA FOR CHECK	*
IJBCOMPO	NAME OF COMPANY, PROGRAM OWNER	CL14
IJBPRODO	NAME OF PROGRAM	CL16
IJBVRMO	VERSION AND RELEASE OF PROGRAM	CL6
IJBTIDO	TASK ID RETURNED BY CHECK	CL2
IJBPIKO	PARTITION ID RETURNED BY CHECK	CL2

Input Parameter Description

None.

Output

None.

Return Codes

None

PRODID AUTH Service

The PRODID AUTH service enables a program with a valid token to obtain the right to use the services or to give up this right. The following services are available through PRODID AUTH:

- EXTRACT ID=PART
- EXTRACT ID=SVA
- GETFLD FIELD=ALET (add to DUAL of current task)
- MODFLD FIELD=PASCOPE1
- MODESET
- PRODEXIT
- TREADY COND=ICCF
- TREADY COND=NO
- SYSDEF
- XMOVE
- MODESET

The system uses a fast path to process this request. The right is granted to the task issuing the request, and is removed at end-of task if not already revoked. This need not be the same task that notified the system with PRODID DEFINE and obtained the token.

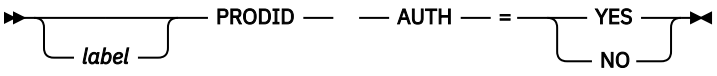
PRODID AUTH gives non-IBM software - and even an IBM program not included in SUBSID support - a status comparable to an IBM subsystem as, for example, CICS. This also means the programs must use utmost care when using the services listed below. The checking in these services is not as extensive as required for a user interface.

WARNING: ANY ERROR IN CALLING THE SERVICES, FOR INSTANCE WITH INCORRECT PARAMETERS OR AT ANY WRONG POINT IN TIME, MAY DAMAGE THE SYSTEM.

Note: Each AUTH=YES request increases a one byte counter attached to the issuing task, each AUTH=NO request decreases it by one.

Requirements For The Caller

- Authorization: valid token
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary or AR



Input Parameter Description

Registers 1 and 2
must contain the token previously obtained by PRODID DEFINE

AUTH
YES requests the right to use special services. If the token passed in registers 1 and 2 is valid, this right is granted.

NO gives up the right.

Output

None.

On return, register 0 is destroyed.

Return Codes

passed back in register 15

0
Right granted for AUTH=YES. Right set off for AUTH=NO.

4
Right revoked for AUTH=NO, but was already revoked or never requested.

8
Right not granted, more than 255 consecutive AUTH=YES requests for this product within this task.

16
IJBVEND not loaded.

Cancel Conditions

X'21'
Invalid token or an unknown function code is passed to PRODID (corrupted macro expansion).

PRODID CHECK Service

PRODID CHECK searches the accumulated notifications entries for either a certain known product, or all releases of such a product, or all products of a certain company, and returns any notification entries found. Also, notification entries of all programs may be retrieved; this is useful when determining the cause of a problem.

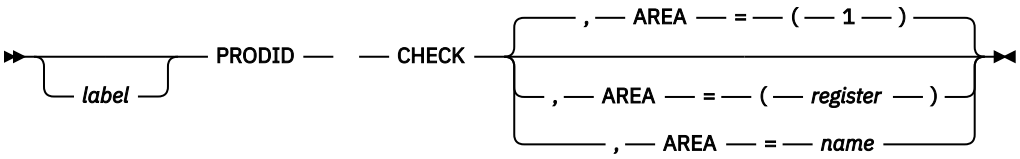
With this service the program checks for a known string.

All occurrences found are moved to the user's area starting at IJBCKARE if the length of this area is sufficient. If the length is not sufficient, a return code indicates this fact and the total number of matching entries is returned in register 0. Then the request may be repeated with a larger area.

Requirements for the caller

- Authorization: none
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary

Invocation



Input Parameter Description

AREA
points to the area that holds the search information. The area can be specified in register notation (the default is 1) or as the name of the input area.

The area must be in an address range valid for this job.

The layout of this string is described by PRODID DSECT. The following values may be passed as input:

IJBCOMPN
contains the name of the company owning the product that is looked for.

If this field contains binary zeros, all notification entries are returned.

IJBPRODN
contains the name of the product looked for. If this field is set to binary zeros, all notification entries with the same company name are returned.

IJBVRMN
contains the version, release, modification level of the program checked for. If this field is set to binary zeros, all notification entries with the same company name and product name are returned.

IJBCKARE
is the begin of the output area, it is supplied in the input pointed to by AREA. In this area the matching notification entries are moved provided they fit.

IJBCKLEN
specifies the length of the output area. The output area must be in an address range valid for this job.

Output

The part from IJBCOMPN to IJBVRM of the found notification entry or entries - including the TIK and PIK of the partition where PRODID DEFINE was issued first - is moved to the area starting at field IJBCKARE in the length specified in IJBCKLEN. If the defining task terminated in the meantime, the fields for TIK/PIK are set to binary zeros. See also “PRODID DSECT Service” on page 13 for the layout of one returned notification entry.

On return, register 0 contains the number of entries found.

Return Codes

codes passed back in register 15

0
Entries matching the search criteria were moved to user area.

4
Entries matching the search criteria were moved to user area. But there are more matching entries that could not be moved because the output area was full. Register 0 contains the number of all matching entries, so repeat request with larger area.

8
No match found or no entry existing.

12
Control block format error (for example, incorrect IJBVIDL).

16
IJBVEND not loaded.

Cancel Conditions

X'21'
Passed token was invalid. This could be caused by a second DELETE request. Or an unknown function code is passed to PRODID (corrupted macro expansion).

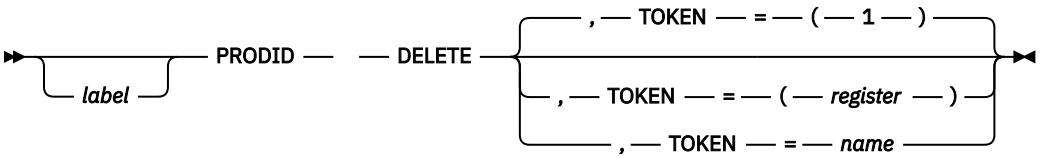
X'25'
Invalid address of parameter list or parameter.

PRODID DELETE Service

With this service the program requests to delete its notification entry and invalidate its associated token. This should be used in the program's termination routine.

Requirements for the caller

- Authorization: valid token
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary



Input Parameter Description

TOKEN
points to the area that holds the token that was previously obtained by PRODID DEFINE. The area can be specified in register notation (the default is 1) or as the name of the input area.

The area must be in an address range valid for this job.

Output

None

On return, register 0 is destroyed.

Return Codes

passed back in register 15

0
Entry deleted. Authority was already reset before DELETE request was issued.

4
Entry deleted, but authority was still granted. Authority is removed.

8
Entry deleted. Authority was already reset before DELETE request was issued. At least one PROEDEXIT DEFINE was removed.

12
Entry deleted, but authority was still granted. Authority is removed. At least one PRODEXIT DEFINE was removed.

16
IJBVEND not loaded.

Cancel Conditions

X'21'
Passed token was invalid. This could be caused by a second DELETE request. Or an unknown function code is passed to PRODID (corrupted macro expansion).

X'25'
Invalid address of parameter list or parameter.

Example of PRODID

Assume an application that needs to use one of the VSE services. The following example illustrates how you might use PRODID in your program.

Defining your Program to VSE and Requesting a Token

In the initialization routine define your application to the system with the PRODID control block MYPROGID and the following code sequence:

```
         ...
* define your program to VSE and ask for a token
         LA    R1,MYPROGID        point to your program's PRODID
*                                 control block
         PRODID DEFINE,(1)        pass its address to VSE with your
*                                 DEFINE request
         LTR   RF,RF              check for return code
         BNZ   CHECKRC1           go analyze return code
* VSE put a token into your PRODID control block
         ...
```

Figure 1. Requesting a PRODID Token

```
MYPROGID DC    AL2(IJBFINST)       length of control block defined
*                                  by VSE
         DC    X'0000'             flag bytes
         DC    C'ANY S/W CORP.'    Company Name used with all products
         DC    C'ANY PROGRAM NAME' Name of this program
         DC    C'020100'           version, rel., mod.level of above
*                                  program
         DC    CL8' '              token passed back by VSE for my
*                                  program
         DC    X'0000'             no area for check needed
MYPROG   PRODID DSECT
```

Figure 2. Coding a PRODID Control Block

Using a VSE Service

Using a VSE service includes the following three steps:

1. Obtain the authority to use the service
2. Use the service
3. Return authority no longer needed.

   Note: It is safer to run with the lowest possible level of authority.

```
         ...
* obtain right to use a service restricted to special users
         LA    R1,MYPROGID        point to your program's PRODID
*                                 control block
         USING MYPROG,R1
         LM    R1,R2,IJBTOKEN     and load your token into r1/r2
         DROP  R1
         PRODID AUTH=YES          pass it to VSE asking for authority
         LTR   RF,RF              check for return code
         BNZ   CHECKRC2           go analyze return code
         ...
* execute the service needed
         ...
* return authority
         LA    R1,MYPROGID        point to your program's PRODID
*                                 control block
         USING MYPROG,R1
         LM    R1,R2,IJBTOKEN     and load your token into r1/r2
         DROP  R1
         PRODID AUTH=NO           return authority
         LTR   RF,RF              check for return code
         BNZ   CHECKRC3           analyze return code
         ...
```

Figure 3. Using PRODID AUTH

In your termination routine delete your program's entry to leave a clean system.

```
         ...
* remove your program's PRODID information from VSE
         LA    R1,MYPROGID        point to your program's PRODID
*                                 control block
         USING MYPROG,R1
         LM    R1,R2,IJBTOKEN     and load your token into r1/r2
         DROP  R1
         PRODID DELETE            ask VSE to invalidate the token and
*                                 to remove your PRODID information
         LTR   RF,RF              check for return code
         BNZ   CHECKRC4           analyze return code
         ...                      continue with your clean up
         ...
```

Figure 4. Deleting the PRODID Token

PRODEXIT Macro - Handling Vendor Exits

This section describes the handling of the PRODEXIT services and the vendor exits. The services are described in detail starting with “PRODEXIT DEFINE Service” on page 23, the exits in “Vendor Exits” on page 34.

Exit Specification

A set of vendor interfaces are provided via exit points that must adhere to the following specifications:

1. To use the vendor exits, the application must be authorized. The valid token is obtained from the PRODID macro, the user must be authorized (DTSECTAB) to access IJBVEND and the products exit routine.
2. Exits can be specified for update (for example, DTFs, or JCL statements) or monitoring (no update). Monitoring exits receive control after exits defined for update. Several exits can be specified for a class or subclass, however only **one** exit per valid PRODID token. Exception: Monitoring and update exits for the same class or subclasses can coexist for the same TOKEN. The exits are activated in FIFO or priority order (depending on PRODEXIT DEFINE specification).
3. Addressability to the work area has to exist for every possible task under which an exit can be invoked. The exit routine itself has to be within the SVA (high or low). AMODE must be 31, and reentrancy has to be considered.
4. An exit can be enabled/disabled without affecting other exits for the same event type.
5. The different exit specifications are stacked per event and invoked as needed for the specific exit.
6. Vendor exits that are elegible for the dynamic ENABLE/DISABLE service can temporarily be enabled/disabled from the vendor in his vendor dispatcher exit routine.
7. Vendor exits have to consider that SVCs in ICCF pseudo partitions are intercepted by ICCF, which may change the input to a specific device.

Classes and Subclasses

The exits can be defined for given exit points in z/VSE components. A z/VSE component is called a **class**, the exit point **subclass**.

Classes are SUP, PSUP, SVC, FSVC, BAM, AIT, DOC, LNG, DOCP.

Subclasses can be defined for every class, for example, a subclass for class SUP is the POSTFCH exit, for class BAM the PRE-OPEN exit. If no subclass is specified, all existing subclasses of the specified class are defined automatically.

Exit Process

The activation service PRODEXIT ACTIVATE can be used by z/VSE components at given points and transfers control to defined vendor exits. Depending on the environment, PRODEXIT ACTIVATE expands:

- In supervisor state to a BASSM call to the ACTIVATE processing (if no exit is enabled, control is returned immediately).
- In problem program state to a normal SVC.

Vendor Exit PSW Key

The vendor exit will be activated with the same PSW key as the issuing subclass of the exit PRODEXIT ACTIVATE.

PRODEXIT Communication Area Location At Exit Entry

The location and storage key of the PRODEXIT communication area, which is input for the exit entry, is described in the corresponding class/subclass paragraph.

An eight byte user area (IJBVUSW) may be given as input to the PRODEXIT DEFINE service for each exit. This field can hold, for example, an anchor for a work area and is given to the exit during activation.

- The PRODEXIT ACTIVATE service returns after **all** vendor exits of same class/subclass are processed.

  Note: Exceptions are described in the corresponding chapter of the vendor exit definition.

If more than one vendor exit is established for a subclass, the priority defined (during PRODEXIT DEFINE in the PRODEXIT area) is used to determine the activation order. Exits defined with the same priority will be activated in the sequence the PRODEXIT DEFINE was issued (FIFO).

Vendor exits defined for **update** (via PRODEXIT DEFINE) are activated prior to the **monitoring** exits. Within the 'update' and 'monitoring' exits the priority is used to determine the activation sequence. 'Update' exits are processed before 'monitoring' exits. 'Monitoring' exits are, per convention, **not** allowed to change any system information, a check however is not possible.

If more than one exit is to be activated, the next exit will get the output (if any) of the former exits within the same type. Exceptions are described in the class/subclass.

Note: If there are more exits defined for **update**, the one with the highest priority will be invoked first. The one with the lowest priority will be invoked last and therefore this one has the final chance to change the output before the control will be given back to the 'ACTIVATE' component.

The DEFINE, DELETE, and CHECK services expand to normal SVCs, the ENABLE and DISABLE services to fast path SVCs. The ACTIVATE and RETURN for PSTATE services also expand to normal SVCs, but the ACTIVATE and RETURN for SSTATE services result in BSM or BASSM.

Exit Scopes

Every exit has a **scope**. When the class or subclass is enabled for:

system scope
: the exit is activated for all tasks.

partition scope
: the exit is activated for all tasks within the partition, including system tasks that execute services for this partition.

task scope
: the exit is activated for the current task only.

Note: Whether an exit is activated or not can be overruled dynamically by the new ENABLE/DISABLE services.

Whenever a new task is attached, it is automatically ENABLEd for:

- An exit of **system scope** if one was enabled.
- An exit of **partition scope** if the new task belongs to the partition for which an exit was enabled.

Note: An attach will fail if the necessary control blocks for vendor exit activation cannot be GETVISed. This can happen if there are vendor exits defined in the system that are 'flagged' to be critical ones (see PRODEXIT DEFINE). In the case of dynamic partitions, the allocation is done anyway, but a message is issued to the console.

Exit Types

There are two types of exits, SSTATE and PSTATE.

Supervisor State (SSTATE) Exits

The exits receive control with the RID (the RID identifies the environment in which the task is running, for example, the usage of save areas) as described in the corresponding class/subclass paragraph (RID ¬= USERTID) and are disabled for interrupts. Register 1 points to a parameter list holding exit-related information (described by “PRODEXIT DSECT Service” on page 31). Register 15 holds the exit routine address at exit entry and may be used by the exit routine. The exit has to return with PRODEXIT RETURN.

The exit will receive control in primary mode and AMODE 31. The high order bit of the exit address (defined by PRODEXIT DEFINE) has to be set. General purpose and access registers are saved before activation of the exit and restored after PRODEXIT RETURN. All areas as well as the exit routine itself have to be fixed for RID = SYSTEMID and may be pageable for environments, that allow page faults (RID=REENTRID).

Note: The space-switching program call (PC-ss) is supported. Therefore, when a program gets control after an interupt, the primary space is not necessarily the allocating space.

Problem Program State (PSTATE) Exits (RID = USERTID)

The PRODEXIT ACTIVATE service provides a save area and saves the status of the service issuer (PSW, general purpose register and access register). The vendor exit receives control in primary mode, problem program state (RID = USERTID) and AMODE 31. High order bit of the exit address (DEFINE service) has to be set to 1 if running in ESA environment. Register 1 points to a parameter list holding exit-related information (described by PRODEXIT DSECT). Register 15 holds the entry point address. The exit has to return via the PRODEXIT RETURN service, which may schedule another exit or restore the saved registers and return to the calling component.

Notes:

1. PSTATE exits are interruptible, however, external interrupts that drive IT, TT, and OC exits are delayed.
2. Per task one PSTATE exit, one SSTATE exit with RID=REENTRID, one SSTATE exit with RID=SYSTEMID (excluding FSVC CLASS), and one SSTATE exit with RID=SYSTEMID CLASS = FSVC can be active the same time.
3. A program check in the vendor exit or an abnormal termination causes skipping of normal program check exits or abend exit routines.
4. Any STXIT macro invocation of a vendor exit leads to ERR21 ==> 'illegal SVC'.

Register Conventions

On Exit Entry:

register 1
address of the area as defined by PRODEXIT DSECT

register 14
exit return address

register 15
exit entry point address

There is no need to save and restore registers for the user of the PRODEXIT ACTIVATE service. However, in case of SSTATE ACTIVATE out of the SVA, the ACTIVATE issuer has to provide a save area via R13.

On PRODEXIT Service Return

On return from any PRODEXIT service, the standard register convention applies, that is, the original contents of R0, R1, and R15 might be destroyed, R14 must have the same value as on entry to the exit.

Deleting an Exit

It is recommended to delete an exit (PRODEXIT DELETE), when the exit is no longer needed. If no deletion occurs, the enable time depends on the scope of an enabled exit:

system scope
enabled until next IPL.

partition scope
enabled until de-allocation of partition. (1.)

task scope
enabled until completion of end-of-task process. (1.)

Notes:

1. If several partitions/tasks are enabled, only the ending partition/task is DISABLEd; any exit remains being DEFINEd until the next IPL if not explicitly deleted via the PRODEXIT DELETE service.
2. An exit eligible for dynamic services remains enabled for dynamic services until IPL or until it is explicitely deleted.

Recovering from Errors

In case of abnormal termination of an exit, the dump routine might issue a cancel message and the corresponding failing address indicates that a vendor exit caused the problem. Other exits of the same subclass are skipped.

An abnormal termination of vendor exits running with RID=SYSTEMID leads to a hardwait.

PRODEXIT Services

The PRODEXIT macro provides the following services:

- “PRODEXIT DEFINE Service” on page 23.
- “PRODEXIT ENABLE Service” on page 26.
- “Dynamic PRODEXIT ENABLE” on page 27.
- PRODEXIT ACTIVATE activates an exit in the corresponding components (vendor exit hooks). This service runs automatically for enabled exits, and is described in PLM documentation (SY33-9164).
- “PRODEXIT RETURN Service” on page 28.
- “PRODEXIT DISABLE Service” on page 29.
- “Dynamic PRODEXIT DISABLE” on page 30.
- “PRODEXIT DELETE Service” on page 30.
- “PRODEXIT DSECT Service” on page 31 shows the contents of the input/output areas of the PRODEXIT services. These areas are called **PRODEXIT area** and **PRODEXIT Extension area**.

The New Dynamic Enable/Disable Services

The z/VSE dynamic PRODEXIT ENABLE/DISABLE services allow vendors to improve the performance of vendor exits especially in a z/VSE multiprocessor environment. This can be achieved by exploiting the z/VSE Vendor Dispatcher Exits. These exits are running as dispatcher extensions in supervisor mode and are *parallel code* in terms of the turbo dispatcher terminology. Within the Vendor Dispatcher Exit, the vendors can decide whether they want to have the normal vendor exit, as defined via PRODEXIT DEFINE, being invoked for that instance or not. This adds some extra code, but it is parallel code and can be executed on multiple processors at the same time. The normal vendor exits are non-parallel code, and by avoiding unnecessary invocations of them, the ratio of parallel code to non-parallel code improves, and so does the overall performance in a multiprocessor environment.

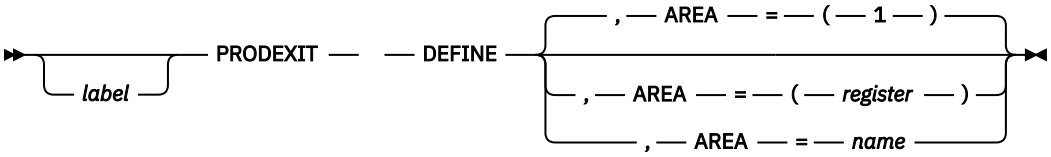
PRODEXIT DEFINE Service

PRODEXIT DEFINE defines a vendor exit of a given class and subclass. If the subclass is omitted, the exit is defined for all subclasses. The DEFINE service returns a PRODEXIT token that allows to use PRODEXIT ENABLE, DISABLE and DELETE services. Before an exit can be activated, it has to be enabled using PRODEXIT ENABLE; initially, the exit is disabled if it is not defined as being eligible for dynamic ENABLE/DISABLE services.

Vendor exits **must not** issue PRODEXIT DEFINE.

Requirements For The Caller

- Authorization: valid PRODID token (as returned by PRODID DEFINE)
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: SVC



Input Parameter Description

AREA=
points to the PRODEXIT area where the input information is available. It may be specified in register notation or as the name of the input PRODEXIT area. The PRODEXIT area must be in an address range valid for this partition. The following fields of the PRODEXIT DSECT are used as input parameters:

IJBVCLS
class of exit. The content is described by PRODEXIT DSECT. Only one exit class can be specified. Class is required.

IJBVSCL
subclass of exit. The content is described by PRODEXIT DSECT. Some classes of exits have several subclasses. If in that case IJBVSCL indication is omitted, the exit is defined for all subclasses. Several subclasses can be specified also. If an exit has only one subclass, it is recommended to set the corresponding subclass indication because of future extensions. Subclass is optional for those Classes that allow the subclass specifications.

Note: Classes SVC and FSVC currently do not support single subclasses, therefore any subclass specification is invalid for them and causes Return Code 12.

IJBVTOK
the PRODID token previously obtained by PRODID DEFINE. Token is required.

IJBVEXT
the exit routine address, the high order bit defines the AMODE on entry of the exit (=0 -> AMODE 24, =1 -> AMODE 31). The exit address is required. AMODE 31 is required if running in ESA mode. If high order bit is not on in VSE, DEFINE issues RC 12. The exit routine has to be within the SVA!

IJBVSCP
the scope of the exit. Scope is required.

IJBVUSW
The 8 byte user word is available for the vendor product, for example, IJBVUSW may hold the pointer to a work area. The contents of IJBVUSW is transferred to the exit. This field is optional and should be cleared to X'00' if no input is available.

IJBVPRIO
This one byte field defines the priority of the exit. The priority can be in the range from 0 to 99 (decimal), where 99 is the highest priority and 0 the lowest. The exits are activated in the priority order (high to low), exits with the same priority are activated in FIFO order dependent on the PRODEXIT DEFINE sequence. Exceptions for exit invocations are described in the corresponding exit definition chapters.

IJBVFUPD
(in flag IJBVFLAG). Exits defined for update (IJBVFUPD set) are processed prior to all other (monitoring) exits. Within the two groups (update or monitoring) the exits are activated in priority (IJBVPRIO) order.

Note: Proper usage of UPDATE or MONITOR is the vendor's responsibility, VSE does not perform any checks.

IJBVCRIT
(in flag IJBVFLAG). An exit defined as critical (IJBVCRIT set) indicates to the system that after the successful processing of that DEFINE service, the system does not ATTACH tasks or ALLOC partitions for which the internal control blocks for the exit activation cannot be obtained. This indication remains valid until all exit are DELETEd that have that flag on. In case of dynamic partitions, allocation is done anyway, but a message is written to the console. In addition, the flag triggers what happens when a second PSTATE exit for the same task is invoked: if the critical bit is set for the second PSTATE exit, the program is cancelled with error 47 (reason code 3 'second vendor exit invocation invalid'), in the other case the invocation is ignored.

IJBVDYN
(in flag IJBVFLAG). Defines an exit as being eligible for ENABLE/DISABLE,DYN=YES,ID=xxx services to the system. If this bit is on, it triggers an automatic enabling of that exit for SCOPE=SYSTEM. If the scope is not SYSTEM, the exit is only enabled for the dynamic services. The exit stays being enabled for dynamic services until it gets deleted via PRODEXIT DELETE.

Note: This support is currently restricted to exits of the CLASS SVC (ID=SVC) only. RC=12 is returned if the CLASS is not supported.

Note: Any CLASS-specific or SUBCLASS-specific restriction for an exit definition is described in the corresponding exit chapter.

Output

An 8 byte PRODEXIT token passed back in the input PRODEXIT area at label IJBVETK.

Return Codes

passed back in register 15.

0
Request accepted.

8
Authorization problem.

=>
PRODID TOKEN index part out of range (>256).

=>
Vendor Product Table not defined.

=>
Vendor Product Table Entry deleted.

=>
Vendor Product TOKEN doesn't match.

12
Control block format error.

=>
No CLASS specified.

=>
Several CLASSes specified.

=>
Specified CLASS not supported.

=>
Specified SUBCLASS not supported.

=>
PRODEXIT AREA length invalid (<84).

=>
SCOPE definition invalid.

=>
Priority definition invalid (>99).

=>
No EXIT routine address specified.

=>
EXIT not in SVA.

=>
EXIT routine not AMODE=31.

=>
SUBCLASS specification invalid for current CLASS.

=>
SCOPE not SYSTEM for CLASS SUP, and SUBCLASS=EXT.

=>
SCOPE not SYSTEM for CLASS AIT.

=>
IJBVDYN bit on in IJBVFLAG, and CLASS not SVC.

16
System phase $IJBVEND not loaded.

20
GETVIS error, return code from GETVIS in register 0.

24
Request rejected, an exit is already defined for at least one subclass or of the class for the specified TOKEN. The corresponding TOKEN has been returned in the input PRODEXIT area at label IJBVETK.

28
Initial system setup for PRODEXIT services failed due to GETVIS problems.

Cancel Conditions

X'21'
Illegal SVC - unknown function code, invalid invocation of PRODEXIT DEFINE, ASC-mode not PRIMARY or no exits for fast path SVC in CLASS SVC are allowed (for example, SVC 107 and 124).

X'25'
Parameter list address is invalid. Results in an addressing exception.

PRODEXIT ENABLE Service

This service enables the exit defined by PRODEXIT DEFINE for exit activation:

System wide
if the IJBVSYS flag was set

For current partition
if the IJBVPAR flag was set

For current task
if the IJBVTSK flag was set

Note: Several ENABLE requests for the same exit are possible.

Requirements For The Caller

- Authorization: valid PRODEXIT token
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: fast path SVC

Input Parameter Description

Register 1 and 2
must contain the PRODEXIT token returned by the PRODEXIT DEFINE service.

Output

Return codes are passed back in register 15.

0
Request accepted.

4
Exit already enabled.

8
Task disabled for PRODEXIT services (GETVIS problem).

16
System phase $IJBVEND not loaded, or no vendor defined in system.

Cancel Conditions

X'21'
Illegal SVC - invalid PRODEXIT token.

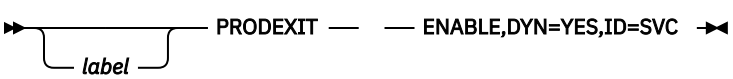
Dynamic PRODEXIT ENABLE

This service enables the exit defined by the coresponding PRODEXIT DEFINE to get activated once for the current task. However, if the current task has also been enabled via the normal PRODEXIT ENABLE service, it stays enabled according to the rules. This service is supposed to be used in a vendor dispatcher exit only.

Note: Several dynamic ENABLE requests for the same exit are possible and can be processed in parallel on different processors in a multiprocessing environment.

Requirements For The Caller

- Authorization: valid PRODEXIT token and SUPERVISOR STATE
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: BASSM



Input Parameter Description

Register 1 and 2
must contain the PRODEXIT token returned by the PRODEXIT DEFINE service.

Output

Return codes are passed back in register 15.

0
Request accepted.

4
Exit not enabled (this should not occur).

8
Task disabled for PRODEXIT services (GETVIS problem).

Dynamic PRODEXIT services not supported for specified ID.

12
Token invalid.

16
System phase $IJBVEND not loaded, or no vendor defined in system.

Cancel Conditions

X'02'
Priviledged operation exception - if not supervisor state.

PRODEXIT RETURN Service

The vendor exit has to return with PRODEXIT RETURN. RETURN uses the same PRODEXIT area given to the exit as input, therefore the area must not be changed (except IJBVRC). However, IJBVRC may not be changed if it is a vendor exit without output. Any information returned from the vendor exit is input for the next exit to be called. For example, the vendor exit return code IJBVRC may be analyzed or changed by a following exit. After the return of the last vendor exit (of the subclass) IJBVRC is given to the caller.

Requirements For The Caller

- Authorization: none
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: SSTATE = BSM, PSTATE = SVC

  Note: Make sure that R14 is not changed during exit processing, it contains the link/return address from the preceding ACTIVATE exit invocation.

Input Parameter Description

none

Output

None.

Cancel Conditions (PSTATE Only)

X'21'
==> Illegal SVC - exit is not active, invalid function code.

ERR2E
==> Deadlock situation during re-occupation of the LTA.

Note: For SSTATE callers that condition leads to unpredictable results.

PRODEXIT DISABLE Service

This service disables the exit defined by PRODEXIT DEFINE.

System wide
If the IJBVSYS flag was set

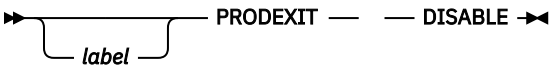
For current partition
if the IJBVPAR flag was set

For current task
if the IJBVTSK flag was set

Note: Several DISABLE requests for the same exit are possible.

Requirements For The Caller

- Authorization: valid PRODEXIT token
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: fast path SVC



Input Parameter Description

Register 1 and 2
must contain the PRODEXIT token returned by the PRODEXIT DEFINE service.

Output

Return codes are passed back in register 15.

0
Request accepted.

4
Exit already disabled.

8
Task disabled for PRODEXIT services (GETVIS problem).

16
System phase $IJBVEND not loaded, or no vendor defined in system.

Cancel Conditions

X'21'
Illegal SVC - invalid PRODEXIT token.

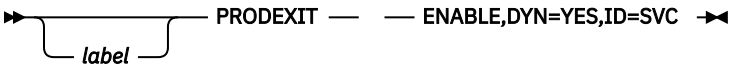
Dynamic PRODEXIT DISABLE

This service disables the exit defined by the corresponding PRODEXIT DEFINE once for the current task. However, if the current task has not been enabled via the normal PRODEXIT ENABLE service, it stays disabled according to the rules. This service is supposed to be used in a vendor dispatcher exit only.

Note: Several dynamic DISABLE requests for the same exit are possible and can be processed in parallel on different processors in a multiprocessing environment.

Requirements For The Caller

- Authorization: valid PRODEXIT token and SUPERVISOR STATE
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: BASSM



Input Parameter Description

Register 1 and 2
must contain the PRODEXIT token returned by the PRODEXIT DEFINE service.

Output

Return codes are passed back in register 15.

0
Request accepted.

4
Exit not enabled (this should not occur).

8
Task disabled for PRODEXIT services (GETVIS problem).

Dynamic PRODEXIT services not supported for specified ID.

12
Token is invalid.

16
System phase $IJBVEND not loaded, or no vendor defined in system.

Cancel Conditions

X'02'
Priviledged operation exception - if not supervisor state.

PRODEXIT DELETE Service

The exit is disabled (if not yet done) and the exit definition is deleted. PRODEXIT DELETE waits for PRODEXIT RETURN, if the exit is active.

Vendor exits **must not** issue PRODEXIT DELETE.

Note: When a vendor product is deleted (using PRODID DELETE) from the system, all associated vendor exits (defined by PRODEXIT DEFINE) are deleted, too. If one of these exits is active, PRODID DELETE waits for the PRODEXIT RETURN from these exits.

Vendor exits that were defined using one DEFINE can only be deleted together.

Requirements For The Caller

- Authorization: valid PRODEXIT token
- AMODE: ANY
- RMODE: ANY
- ASC-mode: Primary
- Invocation: SVC

Input Parameter Description

Register 1 and 2
must contain the PRODEXIT token returned by the PRODEXIT DEFINE service.

Output

Return codes are passed back in register 15.

0
Request accepted.

16
System phase $IJBVEND not loaded.

Cancel Conditions

X'21'
Illegal SVC - invalid PRODEXIT token, may be exit already deleted, or invalid invocation of PRODEXIT DELETE.

PRODEXIT DSECT Service

This service generates one DSECT that describes the in/output for the following services:

- The input and output expected by PRODEXIT DEFINE.
- The input and output expected by PRODEXIT ACTIVATE.
- The input and output expected by PRODEXIT CHECK.
- The output expected by PRODEXIT RETURN.

PRODEXIT DSECT describes the common part, which is input for the PRODEXIT services and the vendor exits, as well as the output area for information returned to the PRODEXIT issuer. The PRODEXIT DSECT holds an address (at label IJBVINF) that points to the PRODEXIT extension of the corresponding subclass at exit entry. This extension is used to communicate between the exit and the VSE component that activated the exit. The unique subclass extension part labels start with **IJBVx**, where **x** is defined as

B
Class = BAM

C
Class = SVC

F
Class = FSVC (fast SVC)

L
Class = LNG (languages)

P
Class = PSUP (supervisor PSTATE)

S
Class = SUP

The input/output for the classes AIT, DOC, and DOCP is not described by the PRODEXIT DSECT but by the following macros:

MAPARCMD
for class = AIT (see “Vendor Exit - VSE/AF Attention Routine” on page 51)

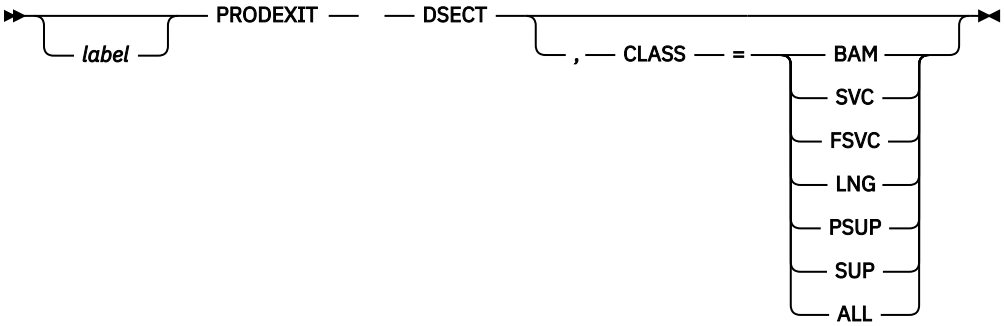
IJBCSMX
for class = DOC (see “Message Processing Exit” on page 48)

IJBCNMEX
for class = DOCP

The first eight bytes of the extension are common to all exits.

Area Location

- RMODE: ANY, in private or shared area dependent on PRODEXIT service.
- ASC-mode: Primary



CLASS=ALL generates the labels for all CLASSES and suppresses double definitions if more than one CLASS is defined in the same assembly.

Macro Interface to VTAPE Command

Vendor software (especially tape management systems) requires an interface to start and stop z/VSE's Virtual Tape Support from a program rather than invoking the JCL VTAPE command.

Invocation

The interface to the VTAPE command processor phase is provided by the new JCLIF macro.

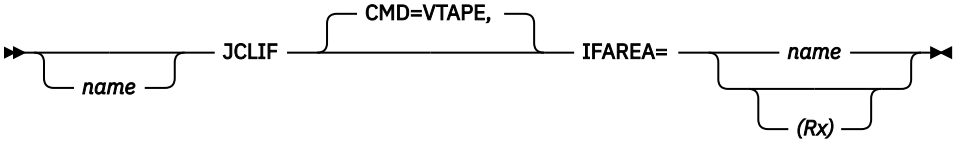
Requirements for the caller:

AMODE:
24 or 31

RMODE:
24 or ANY

ASC Mode
Primary

Register 13 must point to a user-supplied 18F save area.



CMD=VTAPE
In z/VSE 3.1 the one (and only) supported value for the CMD keyword is VTAPE. It is also the default value.

IFAREA=name|(Rx)
IFAREA denotes a user supplied parameter string with the following layout:

Table 2. JCLIF IFAREA LAYOUT

Offset	Type	Description
0	AL4	Pointer to a CL72 message output area, which is filled with an error message, if a syntax error is detected.
4	AL4	Pointer to the command input area. This area must have a length less than 400 characters. The first blank (X'40') character not enclosed in quotes will stop the scan.
8	XL2'0'	Reserved for future use.

Registers 2 to 12 may be used for register notation.

Return Codes in Register 15

0
Job control command provided in CMD keyword completed successfully.

2
Job control command provided in CMD keyword failed. The corresponding error message is contained in the user-supplied CL72 message output area.

4
Invalid input in the user-supplied command input area: either unmatched quotes or no blank character to indicate end of input.

8
Not enough partition GETVIS available to allocate storage for variables and control blocks.

With respect to virtual tape processing the sample program in Figure 5 on page 34 is equivalent to the following job control command:

```
VTAPE START,UNIT=480,LOC=9.164.190.108,                              C
               FILE='D:\Frank''s\Virtual Tapes\test.dat',SCRATCH
```

```
         BALR  R8,0                    ESTABLISH ADDRESSABILITY
         USING *,R8
         ST    R14,SAVER14             REMEMBER RETURN ADDRESS
         LA    R13,SAVEAREA            PROVIDE SAVE AREA
         JCLIF IFAREA=VTAPIF           INTERFACE TO JCL CMD PROCESSOR
         ST    R15,SAVER15             REMEMBER RETURN CODE
         LTR   R15,R15                 VTAPE RETURNED SUCCESSFULLY?
         BZ    EOJ                     ...YES, GOTO END-OF-JOB
         CHI   R15,2                   RETURN CODE 2?
         BNE   EOJ                     ...NO HANDLING FOR RC 4 OR 8
         WTO   TEXT=VTAPMSG0           ...YES, ISSUE ERROR MESSAGE
EOJ      LM    R14,R15,SAVER14         RESTORE RETURN CODE AND ADDRESS
         BR    R14                     BACK TO OPERATING SYSTEM
VTAPIF   DS    0H                      INTERFACE AREA TO VTAPE SUPPORT
         DC    AL4(VTAPMSG)            ADDRESS OF MESSAGE OUTPUT AREA
         DC    AL4(VTAPCMD)            ADDRESS OF COMMAND INPUT AREA
         DC    XL2'0'                  RESERVED FOR FUTURE USE
VTAPCMD  DC    C'START,UNIT=480,LOC=9.164.190.108,'
         DC    C'FILE=''D:\Frank''''s\Virtual Tapes\test.dat'','
         DC    C'SCRATCH '             MUST HAVE TRAILING BLANK
VTAPMSG0 DC    AL2(L'VTAPMSG)
VTAPMSG  DS    CL72                    CONTAINS ERROR MSG IF RC=2
SAVER14  DS    F
SAVER15  DS    F
SAVEAREA DS    18F
```

Figure 5. JCLIF Sample Program

Notes:

1. A quote within the Win/NT folder name must be coded as two single quotes in the job control VTAPE command. Hence it must be coded as four single quotes in the character declaration (DC) for the command input.
2. The blank in folder name `Virtual Tapes` does not stop the input scan, because it is part of the FILE operand, which is enclosed in quotes. The blank character behind SCRATCH stops the input scan.
3. For Win/NT file names with more than 100 characters in length, the FILE='filename' operand may be specified twice or even three times. The following character declaration is equivalent to the one in Figure 5 on page 34:

```
VTAPCMD  DC    C'START,UNIT=480,LOC=9.164.190.108,'
         DC    C'FILE=''D:'','                          DRIVE
         DC    C'FILE=''\Frank''''s\Virtual Tapes\'','   DIRECTORY
         DC    C'FILE=''test.dat'','                    NAME
         DC    C'SCRATCH '             MUST HAVE TRAILING BLANK
```

Restrictions

- Job control exit routines ($JOBEXIT, $JOBEX0n) do *not* get control, when a job control command processor is invoked by means of the JCLIF macro.
- It is up to the user program to substitute symbolic parameters with the GETSYMB macro.
- Continuation lines are not supported. JCLIF expects command input to be stored sequentially in the user-supplied command input area, followed by a trailing blank to indicate end of input.

Input

Same as VTAPE command.

Vendor Exits

The vendor exits must adhere to the following specifications:

- To use the vendor exits, the application must be authorized. The valid token is obtained using the PRODID macro, and the user must be authorized (DTSECTAB) to access IJBVEND and the product's exit routine.

- An exit can be dynamically enabled or disabled without affecting other exits for the same event type.
- The various exit specifications are stacked per event and are invoked as needed for one specific exit.

The following vendor exits are available:

Vendor Exit - VSE/AF Supervisor (SUP)

The following command generates the product extension area (also called DSECT) for this class:

```
name PRODEXIT DSECT, CLASS=SUP
```

The following exits are supported:

- Post SIO/SSCH
- I/O interrupt
- Program check interrupt
- External interrupt
- Exchange phase
- Program retrieval (pre and post fetch)

Post SIO/SSCH

Class
SUP

Subclass
POSTSIO

Purpose
Monitoring

Location
Before current SGVSEPT probe points in SGSCHED

Exit Type
SSTATE

RID
SYSTEMID (=0, no page faults allowed)

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- The CUU that the I/O was issued to
- The CCB address

Output
None

I/O Interrupt

Class
SUP

Subclass
IOINT

Purpose
Monitoring

Location
Before current SGVSEPT probe point

Exit Type
SSTATE

RID
SYSTEMID (=0, no page faults allowed)

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- CSW
- CUU of device causing the interrupt

Output
None

Program Check

Class
SUP

Subclass
PCK

Purpose

- Monitoring
- Error recovery

Note: PCK exits are not invoked during processing of SVC exits.

Location
Before current SGVSEPT probe point in SGPCK

Exit Type
SSTATE

RID
SYSTEMID (=0, no page faults allowed)

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Program check old PSW
- Program interruption code (loc X'8C'-X'8F')
- RID at interruption time
- TID and PIK of interrupted task

- Page fault address (location X'90') if page fault
- Exception access identification (location X'A0') if page fault due to access to data space
- General purpose registers and access registers

Output
A return code is set up in IJBVRC:

00
Continue normal program check handling

04
Only for update exits (IJBVUPD). Continue with PSW, general purpose/access registers as specified in communication area.

Note: The first update exit that returns a RC=4 causes a skip of all following update exit invocations. Only monitor type exits will then get control prior to the execution of the RC=4 processing. If another update exit follows, a bit (IJBVSUPD in byte IJBVFLAG) is set in the PRODEXIT area indicating that an exit was skipped.

08
Only for update exits (IJBVUPD). Ignore program check and return to interrupted task.

External Interrupt

Note: The only predictable exit invocation for SUBCLASS=EXT is provided for SCOPE=SYSTEM. Therefore any other SCOPE is rejected during PRODEXIT DEFINE processing (RC=12).

Class
SUP

Subclass
EXT

Purpose

- Control APPC/IUCV/VMCF
- Monitoring

Location
Before current SGVSEPT probe point in SGNUC (after ENTEXT)

Exit Type
SSTATE

RID
SYSTEMID (=0, no page faults allowed)

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- External old PSW
- External interruption code (loc X'84'-X'87')
- TID and PIK of interrupted task
- TID of task whose timer expired (if any)
- RID of interrupted task
- Service signal interrupt parameter word (EXTPARWD)

Output
A return code is set up in IJBVRC:

00
Continue external interrupt processing.

08
Only for update exits (IJBVUPD). Ignore external interrupt.

Program Retrieval - Exchange Phase

Class
SUP

Subclass
EXPHASE

Purpose

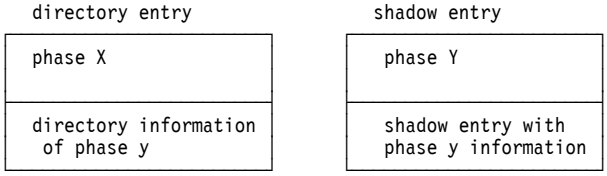
- Security
- Monitoring
- Gaining a probe point

Location
The exit is called for:

- SVC 1 (FETCH), SVC 2, SVC 4 (LOAD), SVC 23, SVC 51, SVC 65 (CDLOAD)

Note, that the phase name in the user area is never exchanged.

- CDLOAD/CDDELETE Processing: The exit is placed at the beginning of the CDLOAD/CDDELETE processing, before the CDLOAD anchor table is searched for the requested phase. This allows an exchange of the phase name. If the phase name is exchanged, the follow-on processing is done with this exchanged phase name. The user-provided phase name is no longer of interest. The entry in the anchor table contains the exchanged phase name.
- SVC 2 Move Mode Processing The exit is called before the SVA is searched for the requested phase. In case the phase is not found in the SVA, the common processing is called (with the original phase name). Note, that during this processing the exit is called again.
- Common Processing (called by SVC 1, SVC 4, SVC 23, SVC 51, SVC 65, and SVC 2 if phase is not in the SVA). The exit is placed at the beginning of the common processing to allow an exchange of the phase name. From now on all processing is done with the changed phase name. The user provided-phase name is no longer of interest. In case the user has provided a directory entry, both the directory entry and the shadow entry are filled with phase information of the exchanged phase name. The phase name in the user-provided directory is not exchanged.



The directory entry contains a pointer to the shadow entry. If the DE is used for follow-on requests, it is checked whether the directory entry and the shadow entry describe the same phase. To avoid problems with the different phase names, the exit is called and must exchange the phase name. Otherwise the information in the directory entry is not considered and the original phase x is loaded.

Exit Type
SSTATE

RID
REENTRID (reentrant programming required)

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- PIK of the current task (2 bytes)
- task-id (TID) of the current task (2 bytes)
- SVC code that generated the request (1 byte)
- name of program to be fetched (8 bytes)

Output
The output (if any) is returned in the input area (pointer to area in field IJBVINF).

A return code is set up in IJBVRC:

0
Continue processing.

4
Only for update exits (IJBVUPD). Change of phase name requested. The phase name is changed to the phase name supplied in the input area. The new phase name is in IJBVSFEP (8 bytes - if IJBVRC = 4).

8
IGNORE Skip FETCH / LOAD / CDLOAD / CDDELETE processing.

Note: When a vendor exit requests to exchange the phase name, it is in the responsibility of the vendor product to guarantee the availability of the exchanged phase. If the phase cannot be loaded, results may be unpredictable.

Program Retrieval - Pre Fetch

Class
SUP

Subclass
PREFCH

Purpose

- Security
- Monitoring
- Gaining a probe point

Location
The exit is called after directory task process (directory search) and runs as service owner (user task). It is only called if the directory search ended with return code 0. It is not called if the phase is in the SVA.

Exit Type
SSTATE

RID
REENTRID (reentrant programming required).

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- PIK of the current task (2 bytes)
- Task ID (TID) of the current task (2 bytes)
- SVC code that generated the request (1 byte)
- Name of program to be fetched (8 bytes)

- Library name of program (7 bytes)
- Sublibrary name of program (8 bytes)
- Directory entry (DE=VSE format - 40 bytes)

Output
A return code is set up in IJBVRC:

0
Continue processing.

4
Only for update exits (IJBVUPD). Reject load request (security violation is posted to the user).

Program Retrieval - Post Fetch

Class
SUP

Subclass
POSTFCH

Purpose

- Security
- Monitoring

Location
The exit is placed:

- After the program fetch task processing (loading the phase) and runs as service owner (user task). It is called even if an error occurred.
- After moving a move mode phase to the LTA during SVC 2 processing.

Exit Type
SSTATE

RID
REENTRID (reentrant programming required).

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- PIK of the current task (2 bytes)
- Task ID (TID) of the current task (2 bytes)
- SVC code that generated the request (1 byte)
- Name of program to be fetched (8 bytes)
- Library name of program (7 bytes)
- Sublibrary name of program (8 bytes)
- Return code
- Directory entry (DE=VSE format - 40 bytes)

Output
None.

Vendor Exit - VSE/AF Supervisor (PSUP)

The following command generates the product extension area (also called DSECT) for this class:

```
name PRODEXIT DSECT, CLASS=PSUP
```

The following exit is supported:

- End-of-task ($IJBSEOT)

End-Of-Task - $IJBSEOT Phase

Class
PSUP

Subclass
EOT

Purpose
The exit is implemented to allow task clean-up.

Location
The exit is placed prior to FREEVIS ALL into the $IJBSEOT routine and is called for main- and subtasks in the AMODE defined by the exit address.

Exit Type
PSTATE

RID
USERTID

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- PIK of current task (2 byte)
- Task ID (TID) of current task (2 byte)
- First cancel code (TIBCNCL) (1 byte)
- Second cancel code (TIBCNCL2) (1 byte)
- Flag byte to indicate main- or subtask termination (1 byte)

Output
None.

Vendor Exit - VSE/AF Supervisor Call

The vendor exit gets control whenever a SVC with exception of SVC 107 (fast path SVC) or SVC 124 (Vendor SVC) is issued.

The following command generates the product extension area (also called DSECT) for this class:

```
name PRODEXIT DSECT, CLASS=SVC
```

Note: Subclass SVC code is subject for future extension. Any subclass specification during PRODEXIT DEFINE is rejected with RC=12!

Class
SVC

Subclass
none

Purpose

- SVC screening
- Monitoring

- Adding vendor SVC numbers
- Ignoring SVCs
- Expansion on IBM SVC processing
- Security

Location
Before current SGVSEPT probe point in SGNUC (after ENTSVC).

Exit Type
SSTATE

RID
REENTRID

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- SVC old PSW
- SVC interruption code
- TID and PIK of interrupted task
- Register and access register at time of interruption

Output
A return code is set up in IJBVRC:

00
Continue normal SVC handling.

04
Only for update exits (IJBVUPD).Replace SVC OLDPSW by IJBVCPSW. Substitute SVC number and continue with general purpose/access registers as specified in the communication area.

08
Only for update exits (IJBVUPD). Ignore SVC and go to routine where modified SVC old PSW address is pointing to (IJBVCPSW) using general purpose/access registers as specified in the communication area.

Note: The first update exit that returns a RC=8 causes a skip of all following update exit invocations. Only monitor type exits will then get control prior to the execution of the RC=8 processing. If another update exit follows, a bit (IJBVSUPD in byte IJBVFLAG) is set in the PRODEXIT area indicating that an exit was skipped.

12
Only for update exits (IJBVUPD). Cancel user due to security violation. Only allowed when SVC issuer (user) had RID=USERTID. In case of security violation, the vendor exit can pass additional information in the PRODEXIT extension area, field IJBVCVIN. This information appears in the cancel message.

Vendor Exit - VSE/AF Fast Path Supervisor Call

The vendor exit gets control whenever a SVC 107 (fast path SVC) is issued.

The following command generates the product extension area (also called DSECT) for this class:

```
name PRODEXIT DSECT, CLASS=FSVC
```

Note: Subclass FSV code is subject for future extension. Any subclass specification during PRODEXIT DEFINE is rejected with RC=12!

Class
FSVC

Subclass
none

Purpose

- SVC screening
- Monitoring
- Security

Location
New probe point in SGNUC, after SVC 107 path is entered.

Exit Type
SSTATE

RID
SYSTEMID (=0, no page faults allowed)

Communication area
SVA, RMODE=ANY, shared area

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- SVC old PSW
- SVC interruption code
- RID of interrupted task
- TID and PIK of interrupted task
- Register and access register at time of interruption

Output
A return code is set up in IJBVRC:

00
Continue normal SVC handling.

12
Only for update exits (IJBVUPD). Cancel user due to security violation. Only allowed when SVC issuer (user) had RID=USERTID. Hard wait otherwise. In case of security violation, the vendor exit can pass additional information in the PRODEXIT extension area, field IJBVFVIN. This information appears in the cancel message.

Vendor Exit - VSE/AF Basic Access Method

The following command generates the product extension area (also called DSECT) for this class:

```
name PRODEXIT DSECT, CLASS=BAM
```

The following exits are supported:

- Pre-OPEN
- Pre-CLOSE
- EOX processing for sequential disk
- Common VTOC handler
- Post-OPEN
- Post-CLOSE

Invocation

When exits are invoked in a B-transient phase (Post-OPEN, Post-CLOSE, Pre-OPEN, and Pre-CLOSE), the logical transient area is freed before the exit is taken.

Pre OPEN

Class
BAM

Subclass
PREOPEN

Purpose

- Monitoring
- Ignoring OPEN
- Replacing DTFs and ACBs

Location
At the beginning of OPEN, just before the system does any action with the DTF/ACB ($$BOPEN1).

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input

IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Pointer to the DTF/ACB (4 bytes), IJBVBDTF
- Flag byte IJBVBFLG
  - X'80', IJBVBJCT, indicates request is from JCL

Output
A return code is set up in IJBVRC:

00
Continue with normal OPEN processing for this DTF/ACB.

04
Ignore OPEN of this DTF/ACB. No system action is done with this DTF/ACB.

12
Change of DTF/ACB address requested. The DTF/ACB address in users parameter list is replaced by the address returned by the exit in IJBVBDTF and OPEN continues with this DTF/ACB.

Note: If a vendor exit passes an invalid return code at return, the system continues normal processing.

Pre CLOSE

Class
BAM

Subclass
PRECLOSE

Purpose

- Monitoring
- Ignoring OPEN
- Replacing DTFs and ACBs

Location
At the beginning of CLOSE, just before the system does any action with the DTF/ACB ($$BCLOSE).

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Pointer to the DTF/ACB (4 bytes), IJBVBDTF

Output
A return code is set up in IJBVRC:

00
Continue with normal CLOSE processing for this DTF/ACB.

04
Ignore CLOSE of this DTF/ACB.

08
Perform **no** rewind, only for DTFMT and DTFPH for tape.

12
Change of DTF/ACB address requested. The DTF/ACB address in users parameter list is replaced by the address returned by the exit in IJBVBDTF and CLOSE continues with this DTF/ACB.

Note: If a vendor exit passes an invalid return code at return, the system continues normal processing.

EOX Processing

Class
BAM

Subclass
BAMEOX

Purpose
Monitoring

Location
After EOX is recognized for sequential disk and before the next EXTENT if any is obtained. The exit is **not** invoked for end of extent during CLOSE.

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Pointer to the DTF (4 bytes), IJBVBDTF

Output
none

CVH Processing

Class
BAM

Subclass
BAMCVH

Purpose

- Monitoring
- Ignoring OPEN

Location
At the very beginning of the common VTOC handler (IJJHCVH0).

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Address of CVH parameter list IJJHCPL (4 bytes), IJBVBCPL

Output
A return codes is set up in IJBVRC:

00
Continue with normal Common VTOC Handler processing.

04
Return immediately to caller. In this case it is the vendors responsibility to maintain the Common VTOC Handler interface to the caller. Return code 4 is not allowed for OPEN and CLOSE VTOC requests.

Note: If a vendor exit passes an invalid return code at return, the system continues normal processing.

Post OPEN

Class
BAM

Subclass
POSTOPEN

Purpose

- Monitoring
- Replacing DTFs and ACBs

Location
At the end of OPEN process, before the next DTF is handled or before return to user using SVC 11 if the last or only DTF has been handled ($$BOPEN1).

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Pointer to the DTF/ACB (4 bytes), IJBVBDTF
- Flag byte IJBVBFLG
  - X'80', IJBVBJCT, indicates request is from JCL

Output
A return codes is set up in IJBVRC:

00
Continue with normal OPEN processing.

12
Change of DTF/ACB address requested. The DTF/ACB address in users parameter list is replaced by the address returned by the exit in IJBVBDTF and normal processing continues.

Notes:

1. If a vendor exit passes an invalid return code at return, the system continues normal processing.
2. Post OPEN exit invocation is only guaranteed for DTFMT, DTFPH for tape, and DTFs for disk. The Invocation for other DTFs is unpredictable.

Post CLOSE

Class
BAM

Subclass
POSTCLOS

Purpose

- Monitoring
- Replacing DTFs and ACBs

Location
At the end of CLOSE process, before the next DTF is handled, or before return to user using SVC 11 if the last or only DTF has been handled ($$BCLOSE).

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Pointer to the DTF/ACB (4 bytes), IJBVBDTF

Output
A return codes is set up in IJBVRC:

00
Continue with normal CLOSE processing.

12
Change of DTF/ACB address requested. The DTF/ACB address in users parameter list is replaced by the address returned by the exit in IJBVBDTF and normal processing continues.

Notes:

1. If a vendor exit passes an invalid return code at return, the system continues normal processing.
2. Post CLOSE exit invocation is only guaranteed for DTFMT, DTFPH for tape, and DTFs for disk. The Invocation for other DTFs is unpredictable.

Vendor Exit - VSE/AF Console Support

Message Processing Exit

Class
DOC

Subclass
MSG

Purpose

- Monitoring every message (using WTO/WTOR or SVC 0/15)
- Updating control information and text
- Suppressing or automatically replying to messages

Location
The exit is invoked after converting the message to a common format, including the message prefix, and before queueing the message for delivery. If OCCF message processing is active, it is also invoked before the exit.

Exit Type
SSTATE

RID
SYSTEMID (no page faults allowed, emercency messages only) or REENTRID (page faults allowed)

Communication area
SVA, RMODE=ANY, partition GETVIS

Input
IJBVINF points to the communication area (input and output area). The area holds the following information at exit entry:

- Message parameters that cannot be changed (like originating jobname).
- The adress of a message area, also described by IJBCSMX and containing data may be updated:
  - Name of the target console
  - Routing and descriptor codes
  - Presentation attributes
  - Message text lines (space for up to 12 lines is provided)

  This area is initially filled with original message data.
- The address of an automatic reply area, consisting of a 2-byte length followed by up to 126 bytes of reply text. This area is initially empty (length field is zero). An automatic reply must be prepared in this area, as if it was entered from a console (but without the leading reply-id). An automatic reply may be provided also when no READ was yet issued. In such a case, the reply is processed automatically for a following stand-alone read , a following stand-alone WTOR (that is a WTOR with a 'just-one-blank' text) or discarded otherwise.
- A flag byte for requesting one of the following processing options:
  - Suppress the message.
  - Reply to message automatically.
  - Route message to a console with AUTO attribute
  - Update message control information
  - Update message text

Output
None.

Note:

1. This exit is not intended for intercepting/redirecting messages through an alternate queueing mechanism.
2. The exit is not invoked for DOM requests.
3. In some cases, for example, when no queue space is immediately available for an extended message, the exit may be invoked several times for the same message, with identical message contents.

Command/Reply Processing Exit

This exit allows to monitor every input, entered via MGCRE or SVC 30, and to reject it or to update input text.

Class
DOC

Subclass
CMDREP

Purpose

- Monitoring every input (entered using MGCRE or SVC 30)
- Rejecting input
- Updating input text

Location
The exit is invoked after converting console input to a common format, and before processing or queueing it for delivery. If OCCF input processing is active, it is also invoked before the exit.

Exit Type
SSTATE

RID
REENTRID (page faults are allowed).

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input and output area), which is described by the IJBCSMX mapping macro. The area holds the following information at exit entry:

- Input parameters that cannot be changed (like originating console name).
- The address of an input area, consisting of a 2-byte length followed by up to 126 bytes of input text. This area is initialized with the original input.
- A flag byte for requesting one of the following processing options:
  - Reject the input
  - Update input text

Output
None

Notes:

1. This exit is neither invoked for automatic replies, generated by a message processing exit (see “Message Processing Exit” on page 48), nor for EXPLAIN requests.
2. Any return code setting in IJBVRC is ignored.

Full Scale input processing exit

This exit allows to monitor every console input [entered on the command line], every timer interrupt, reconnect, message pending, action message received, alert posted, suspended, and unrecoverable error.

Class
DOCP

Subclass
FINPUT

Purpose

- Monitor command inputs.
- Update these inputs.
- Monitor timer interrupts.
- Monitor reconnect.
- Monitor message pending.
- Monitor action/decision message received.
- Monitor alert posted.
- Monitor console suspended.
- Monitor unrecoverable error.

Location
The exit is invoked for every user input in console mode and for other events, as indicated in field CEXEVNT. The exit has the option to take over control of console output ('vendor mode'). In this mode, the screen is fully managed by exit code, while input is still handled by standard code and passed to the exit, as in console mode.

Exit Type
PSTATE

Input
IJBVINF points to the communication area(input and output area), which is described by the IJBCNMEX mapping macro. The area holds the following information at exit entry:

- Addresses of screen and message definitions. Mappings defined in IJBDEF macro.
  - address of panel data table
  - address of PF-key data table
  - address of message data table
- Terminal characteristics
  - number of screen lines
  - number of screen columns
  - DBCS capability: 'Y' or 'N'
  - ext data stream capability: 'Y' or 'N'
  - number of supported colors
  - supported color attributes
  - number of supported highlites
  - supported highlite attributes
- Event flags. Flags CEXEMSGP, CEXEALRT and CEXESUSP, once set, remain on until the exit routine leaves vendor mode. These flags may therefore be set in combination with other flags, which are mutually exclusive.
  - user input
  - timer interput

- action/decision message received
- reconnect (after PF3/PF4)
- message pending
- alert posted
- console suspended
- unrecoverable error

Output

- Processing flags, timer interval
- The options'use updated input' and 'enter vendor mode' are only processed for 'user input' events.
- Since the screen is controlled in vendor mode by the exit, the exit is also responsible for issuing a write, that unlocks the keyboard, for every user input passed to it.
- when entering vendor mode, any pending timer interupt is cancelled.
- The option 'set timer' may only be specified in conjunction with 'enter vendor mode' or while vendor mode is active. When specified in vendor mode, any already scheduled interrupt is cancelled. A new interrupt is set only if the value passed in CEXPTIMS is > 0.

Vendor Exit - VSE/AF Attention Routine

The Attention Routine supports two exits that allow to customize existing system commands or to add new commands. They are not intended for modifying command input (the CMDREP exit described in “Command/Reply Processing Exit” on page 49 should be used for this purpose).

Note: The only predictable exit invocation for CLASS=AIT is provided for SCOPE=SYSTEM. Therefore SCOPE=PARTITION/TASK is rejected during PRODEXIT DEFINE processing (RC=12).

Pre-Scan Exit

Class
AIT

Subclass
CMD1 (Pre-Scan)

Purpose
This exit allows to intercept all z/VSE system commands that are processed by or routed through the Attention Routine, and to provide customized versions of such commands.

Location
The exit is invoked before AR parses the command.

Exit Type
PSTATE

RID
USERTID

Communication area
SVA, RMODE=ANY

Input
The pointer for this vendor exit is different from the others, as described in the following paragraph.

IJBVINF points to an area containing the command string, along with other command attributes like its origin, and described by the mapping macro MAPARCMD.

Output
A return code is set up in IJBVRC:

0
Command was taken over by the exit.

Note: The first update exit that returns a RC=0 causes a skip of all following update exit invocations. Only monitor type exits will then get control prior to the AR CMD processing. If another update exit follows, a bit (IJBVSUPD in byte IJBVFLAG) is set in the PRODEXIT area indicating that an exit was skipped.

4
Command was not recognized.

Post-Scan Exit

Class
AIT

Subclass
CMD2 (Post-Scan)

Purpose
This exit allows to define and support new commands that are routed through the Attention Routine, but are not recognized as known z/VSE system commands.

Location
The exit is invoked when the command is not recognized as an AR or active subsystem command.

Exit Type
PSTATE

RID
USERTID

Communication area
SVA, RMODE=ANY

Input
The pointer for this vendor exit is different from the others, as described in the following paragraph.

IJBVINF points to an area containing the command string, along with other command attributes like its origin, and described by the mapping macro MAPARCMD.

Output
A return code is set up in IJBVRC:

0
Command was taken over by the exit.

4
Command not recognized.

Vendor Exit - z/VSE Language Environment

"How to Use this Exit" on page 56 describes the various approaches to using this exit.

Class
LNG

Subclass
LNGOPEN

Purpose
The exit allows a disk or tape manager to intercept file open processing for LE/VSE-enabled languages, and allows it to provide some information or cause it to bypass some of the pre-open checks. These languages perform some pre-open checking to enable them to return correct statuses to the programs. When a disk or tape manager provides some information, such as logical unit, during open, the language checks will fail, and the open is not issued. This exit allows this information to be provided to the language, or to request the language to bypass these checks. If these checks are bypassed, some of the statuses returned may be incorrect.

Location
The exit is invoked by LE/VSE when the LE/VSE Message file is opened, or when an open is requested in an LE/VSE-enabled language (COBOL/VSE, C/VSE or PL/I VSE). The exit is invoked before building the DTFSD, DTFDA, DTFDU, DTFMT, DTFPR, or DTFCD, and prior to opening the file. It is also invoked by the COBOL/VSE compiler prior to checking the logical unit for the compiler work files.

Notes:

1. If errors are detected after the exit is invoked, the OPEN is not issued.
2. The exit is not invoked for files that are accessed using an ACB.

Exit Type
PSTATE

RID
USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input and Output
IJBVINF points to the communication area (input and output area). The area holds the information shown in the following table at exit entry.

The Type column contains "Input" if it is provided by the language, "Output" if it is provided by the exit, or "Input/Output" if it is provided by the language but may be modified by the exit.

Table 3. LNG Exit - Communication Area for File Processing

Field	Size	Type	Description
IJBVLENV	H	Input	Length of area
IJBVPIK	H	Updated by supervisor	PIK of current task
IJBVTIK	H	Updated by supervisor	TIK of current task
Reserved	H		Reserved
IJBVLLVL	F	Input	Level number of the parameter list.
IJBVLANG	CL8	Input	The Language product that is invoking the exit, for example, COBOL, PL/I, LE.
IJBVLNAM	CL8	Input	The name from the COBOL ASSIGN statement, or PL/I File DECLARE statement.
IJBVLLUN	H	Input	The logical unit number from the COBOL ASSIGN statement, or PL/I File DECLARE statement, or zero if not provided.

IJBVLOPM	X	Input	Open mode with values as follows:
			`IJBVLIN  X'01' - Input`
			`IJBVLIO  X'02' - I/O (for example, TYPEFLE=INPUT and UPDATE=YES)`
			`IJBVLOUT X'03' - Output`
			`IJBVLEXT X'04' - Extend (append)`
			`IJBVLWRK X'05' - Work (for example, compiler work file)`

Table 3. LNG Exit - Communication Area for File Processing (continued)

Field	Size	Type	Description

IJBVLDEV	X	Input/ Output	Device type for file with values as follows:
			`IJBVLDSD X'01' - SAM disk`
			`IJBVLDDA X'02' - DAM disk`
			`IJBVLDVS X'03' - VSAM disk`
			`IJBVLDUT X'04' - Unlabeled tape`
			`IJBVLDLT X'05' - Labeled tape`
			`IJBVLDCD X'06' - Card`
			`IJBVLDPR X'07' - Printer`
			`IJBVLDUA X'08' - Unassigned (UA)`
			`IJBVLDIG X'09' - Assigned to IGNORE`
			This field can be modified by the exit to change the device type of the file. For instance, a labeled tape can be changed to an unlabeled tape or a disk file can be changed to a tape file. This field should not be modified for DAM files or files with an open mode (IJBVLOPM) of WORK (IJBVLWRK).
			Note: The device type is set to SAM, DAM, or VSAM-managed SAM when a DLBL is present. It is set to labeled tape when a TLBL is present. It is set to one of the other device codes when neither a DLBL or TLBL is present, according to the type of device to which the logical unit number (IJBVLLUN) is assigned.

IJBVLLBA	A	Input/ Output	The address of the DLBL or TLBL retrieved by the language product. This is present for Disk, or labeled tape files. The fields within the DLBL or TLBL can be altered as required. The length of the DLBL or TLBL (IJBVLLBL) can be increased up to length of the buffer containing the DLBL or TLBL (IJBVLLBB). The address can be changed to the address of an area acquired by the exit, and the length (IJBVLLBL) updated to reflect the new length. The fields that are currently used from the DLBL are as follows: • File ID (if not provided in field IJBVLFID). • Logical unit number (for SAM DLBL if not provided in field IJBVLLUO) • Blocksize (for SAM DLBL if not provided in field IJBVLBSO) • Catalog name (for VSAM DLBL) The fields that are currently used from the TLBL are as follows: • File sequence number (for multi-file tape).
IJBVLLBL	F	Input/ Output	The length of the DLBL or TLBL retrieved by the language product using the `LABEL FUNCT=GETLBL` macro.
IJBVLLBB	F	Input	The length of the buffer containing the DLBL or TLBL retrieved by the language product using the `LABEL FUNCT=GETLBL` macro.

IJBVLOPT	XL2	Input/ Output	Other open options.
			`IJBVLORV x'80' - OPEN REVERSED specified`
			`IJBVLNRW x'40' - OPEN NO REWIND specified`
			`IJBVLASC x'20' - ASCII tape file`
			`IJBVLOPF x'10' - OPTIONAL file (COBOL only)`
			`IJBVLCBM x'08' - MODE=C (column binary mode)`
			`(3505 and 3525 card devices only)`
			`IJBVLOMR x'04' - MODE=O (Optical mark read)`
			`(3505 card devices only)`
			`IJBVLRCE x'02' - MODE=R (Read Column Eliminate)`
			`(3505 and 3525 card devices only)`

Table 3. LNG Exit - Communication Area for File Processing (continued)

Field	Size	Type	Description
IJBVLPUB	X	Input/ Output	Pub code This field is provided by the language product for unlabeled tape, card and printer devices, and may be modified by the exit. It is used to determine the device type when a DTF is built.
IJBVLFEX	X	Output	File exists flag set by exit to X'01' if file currently exists, or X'02' if file does not exist. If it is not set (left as X'00'), and the file is being opened for input or I/O, the language attempts to determine if the file exists.
IJBVLLUO	H	Output	The logical unit number determined by the exit. If it is provided, the subsequent processing by the language uses this logical unit number. If it is not provided for a SAM file, the language attempts to determine the logical unit from the DLBL or COBOL ASSIGN statement or PL/I File DECLARE statement.
IJBVLFID	CL44	Output	This is the file ID for the file, with any vendor-supplied tape or disk manager control characters removed. If it is not provided, the language uses the file-id from the DLBL or TLBL statement for a SAM file.
IJBVLLEX	H	Output	Extent number of the last volume. This is applicable to SAM files only. If it is not set (left as zero), the language attempts to determine the extent number of the last volume from the DLBL/EXTENT statements. The extent number is used by COBOL when the CLOSE REEL/UNIT statement is used. **Note:** If the vendor-supplied tape or disk manager provides extents as required, this field can be set to -1. This disables the CLOSE REEL/UNIT statement for COBOL.

IJBVLRFI	H	Input	Record format from program (zero if not provided) as follows:
			`IJBVLRFF x'80' - Fixed`
			`IJBVLRFV x'40' - Variable`
			`IJBVLRFU x'20' - Undefined`
			`IJBVLRFB x'10' - Blocked`
			`IJBVJRFS x'08' - Spanned`
			`IJBVLRFA x'04' - ASA control characters`
			`IJBVLRFM x'02' - Machine control characters`
			For example, x'90' for Fixed Blocked.

IJBVLRSI	F	Input	Record length from program (zero if not provided)
IJBVLBSI	F	Input	Block size from program (zero if not provided)
IJBVLRFO	H	Output	The record format for the existing file if available, with the same flags as IJBVLRFI. If it is not set (left as zero), the file is being opened for input or I/O, and it is a VSAM-managed SAM file, the language determines the record format from the VSAM catalog. For a file opened for Input, I/O, or Extend, the record format from the program is checked to ensure it matches the record format for the input file.

Table 3. LNG Exit - Communication Area for File Processing (continued)			
Field	**Size**	**Type**	**Description**
IJBVLRSO	F	Output	The record length of the existing file if available. If it is not set (left as zero), and the file is being opened for input, I/O, or EXTEND, and it is a VSAM-managed SAM file, the language determines the record length from the VSAM catalog. For a file opened for Input, I/O, or Extend, the record length from the program is checked to ensure it matches the record length for the input file. If the record length is not specified in the program (for example, RECORD CONTAINS 0 CHARACTERS for COBOL), the record length provided in this field is used (if non-zero).
IJBVLBSO	F	Output	The block size of the existing file or output file. If it is not set (left as zero), the language attempts to determine the block size. For a VSAM-managed SAM file, the VSAM catalog is checked. For a SAM file, the block size from the DLBL is used if present. This block size overrides the block size specified within the program for a disk or tape file with the record format specified as blocked. If the record format is fixed, the block size must be a several of the record size.
IJBVLLMA	A	Output	The address of the LIOCS logic module to be placed in the DTF after open. This may be used to replace the IBM-supplied logic module.
IJBVLLMS	A	Output	The address of a fullword to return the address of the logic module in the DTF prior to being overwritten by the logic module address supplied above.

A return code is set up in IJBVRC

00
Continue processing.

04
Continue processing, but bypass any pre-open checks. The open processing continues if the following errors are detected.

- No EXTENT card has been provided for a SAM DLBL, and the logical unit number was not provided on the COBOL ASSIGN statement or PL/I File DECLARE statement.
- The logical unit is not assigned.
- The file has been opened for Input or I/O, and the file does not exist.

Other
Don't continue processing, and fail the open.

How to Use this Exit

Depending on how much effort a Vendor may wish to expend, and the capabilities of the Vendor product, the exit can do one of the following:

Approach 1 - Minimal Approach
The minimal approach would be for the Vendor Exit to set IJBVRC to 4. This causes the languages to skip the checking of the device. This would allow the files to open, but the restrictions that are currently present when the Vendor products are present would still apply.

Some of the known restrictions are as follows:

1. Support for OPTIONAL files in COBOL is not provided.
2. Some file statuses under COBOL are not returned correctly.

3. Support for CLOSE REEL/UNIT in COBOL is not provided.

Approach 2

The above restrictions are caused when the language product cannot determine whether the file exists, or cannot determine the file attributes. The language product cannot perform these checks because the file-id on the DLBL or TLBL might not be the actual file-id, or because the logical unit number is not available.

The exit could perform the updating of the DLBL or TLBL statement including the assignment of the logical unit during the exit processing instead of during the OPEN. If the file-id on the DLBL or TLBL statement is not the actual file-id, the actual file-id should be returned.

This would involve setting the following fields:

- Logical unit number
- File-id (if the file-id on the DLBL or TLBL does not match the actual file-id)
- File exists flag (Input and I/O only)
- Number of volumes

Approach 3

In addition to the processing for the previous approach, if the vendor product has information about the file such as record format, record length, and block size that is not available directly from the z/VSE operating system, the record format, record length, and block size can also be returned.

COBOL has the ability to enable a program to read a file with fixed length records of any length (RECORD CONTAINS 0 CHARACTERS), or with any block size (BLOCK CONTAINS 0 RECORDS). If this information is returned by the exit, it enables a COBOL program to read these files. This information is currently retrieved from the VSAM catalog by COBOL for VSAM-managed SAM files.

PL/I has the ability to enable a program to read a file with any record format, record length, and block size. If this information can be returned by the exit, PL/I could then open the file without requiring the program to specify this information.

This approach provides additional capabilities to the COBOL and PL/I languages when the vendor-supplied tape or disk manager is operating and able to provide the additional information. This brings the VSE versions of COBOL and PL/I closer to the capabilities provided by the z/OS operating system.

Vendor Exit - VSE/VSAM Extent Exit

The following command generates the product extension area (also called DSECT) for this class:

```
name PRODEXIT DSECT, CLASS=VSAM
```

Class

VSAM

Subclass

IJBVVEXU - EXTENT UPDATE

Scope

System

Purpose

The exit allows to monitor the allocation and de-allocation of VSAM data space extents as well as the suballocation of VSAM cluster extents in VSAM data space.

Location

The exit is invoked by VSE/VSAM before VSAM completes allocation, suballocation, or deletion of an extent by updating the catalog data space bitmap.

Exit Type

PSTATE

RID

USERTID

Communication area
Partition GETVIS, RMODE=ANY

Input
IJBVINF points to the communication area (input area). The area holds the information shown in the following table at exit entry.

Table 4. Format of IJBVVEXU Communication Area

Field	Size	Description
IJBVLENV	H	Length of area
IJBVPIK	H	Updated by supervisor. PIK of current task
IJBVTIK	H	Updated by supervisor. TIK of current task
	H	Reserved
IJBVVVER	X	Version of the vendor info block, currently x'00'
IJBVVFLG	X	Flags with values as follows: IJBVVDEL X'80' – ON if extent is to be deleted, otherwise extent is to be allocated or suballocated IJBVVCYL X'40' – ON if extent is specified in cylinders, otherwise allocation units are tracks IJBVVFBA X'20' – ON if extent is on an FBA device IJBVVSE X'10' – ON for anonymous data space extents, otherwise extent is suballocated for a named cluster component
IJBVVVOL	CL6	Volume serial number
IJBVVVCT	0XL4	Device class and type as in the GETVCE macro
IJBVVVD1	X	Device operational character (as DCTUFLG)
IJBVVVD2	X	Device optional features (as DCTUOPT)
IJBVVVDC	X	Device class (as DCTUDCL), X'21' for FBA devices
IJBVVVDT	X	Device type (as DCTUTYP)
IJBVVVCN	F	Number of cylinders on the volume
IJBVVVTN	H	Number of tracks per cylinder
IJBVVVBN	H	Number of blocks per track on FBA disks or number of bytes per track on ECKD disks
IJBVVEXB	F	Extent begin, number of starting allocation unit
IJBVVEXS	F	Extent size, number of allocation units
IJBVVCNM	CL44	Catalog name
IJBVVDNM	CL44	If IJBVVSE is OFF, then this field contains the cluster component name as appeared in LISTCAT, otherwise one of the following strings: "DEFINE CATALOG", "DEFINE SPACE", "DELETE CATALOG", "DELETE SPACE"

Output
None

Notes:

1. Any return code setting in IJBVRC is ignored.
2. When a catalog is created or deleted multiple events take place. These are reduced to a single event as follows:
   - At catalog creation, the catalog components which appear in LISTCAT as VSAM.CATALOG.BASE.INDEX and VSAM.CATALOG.BASE.DATA are reported by the exit as an extent named VSAM.CATALOG.BASE.
   - At catalog deletion, the event is reported by the exit as fields IJBVVVOL, IJBVVVCT, IJBVVVCN, IJBVVVTN, IJBVVVBN set to binary zeroes and the fields IJBVVEXB and IJBVVEXS set to -1. Neither extent nor volume information are reported.

Part 3. Documentation and Multicultural Support

Chapter 4. VSE Customer Documentation

To develop VSE documentation, consider the following to provide the information necessary for the user to be able to effectively and easily use the product:

- The general approach to structuring data
- The design structure of the library
- The organizing principles of the individual manual.

Task-Oriented Approach

When writing a computer manual, the most important question a writer asks is: how do I structure my book? According to which principles do I organize the available material? Which items do I include and which should I omit? What information should I provide at what time?

VSE uses a task-oriented approach to organize and structure information in a way that both experienced and inexperienced users of a product can easily follow.

The basic question a writer of task-oriented manuals asks is:

- Which tasks do I perform with this product?

The information given then in the manual is grouped to support that task. All the information in a task-oriented book should be appropriate for the task being performed. Appropriateness to task is the standard for excluding or selecting information.

Shipment Documentation

Operational Manual(s)

The operational manual(s) is/are structured according to the different tasks to be performed. The library may include the following manuals:

- The **Planning** manual is written to guide the customer on the options a program offers and the resulting decisions that need to be made for the tasks of installation, customizing, operation, administration, application programming, and diagnosis of the software.

  Topics covered may include:

  - Installation planning to the product. For example, which system configurations support the program?
  - Operation planning to the product. For example, which resources does the program use, or which abnormal events might occur during execution of the program?
  - Customizing planning to the product. For example, which user routines must be appended to the program?
  - Migration planning to the product. For example, which conversion aids can be used to migrate to the program?
  - Administrative planning to the product. For example, which resources (databases, transactions, or user profiles) must be defined by the program?
  - Application programming planning. For example, which system services or resources are required to support application programs?
  - Diagnosis planning. For example, which diagnostic aids are available?
- The **Installation** manual describes how to install and customize the product so that it is ready to be used.
- **Operations** manual should describe the facilities for the user, the purpose and the means.

- **Messages and Codes** lists all messages and other error codes together with the reason and the appropriate actions to take. This could also be a chapter in the Diagnosis manual.
- **Diagnosis**, either a separate manual or a chapter, should guide the user/administrator to determine if a problem is a user error, or a problem within the product or a problem of a product combination.

Chapter 5. Providing Multicultural Support

In today's worldwide marketplace, products must be designed to provide multicultural support.

When the subject of multicultural support is mentioned, most people think of translating software panels, messages, and publications into languages other than English. But, multicultural support consists of much more than just translation. To really support a national language, a product must accommodate all aspects of the language. It demands attention to sorting sequences, to date and time, to currency, and to many other national and cultural factors, to mention just a few items.

IBM has published a set of rules and guidelines that are considered necessary to enable a product to provide that support. Like all other design considerations, the decision to follow particular rules and guidelines is made after balancing various requirements with design constraints. For your program to achieve maximum benefit from these rules and guidelines, however, you should consider them at the earliest possible development stage.

Statements regarding multicultural support for any country named in these rules and guidelines are suggestions for general applications. Particular industries and applications may require multicultural support different from what is stated here.

Common User Access (CUA)

The Common User Access (CUA), a basic element of Systems Application Architecture® (SAA), ensures consistency in designing interactive user interfaces. To ensure that the appropriate multicultural support can be provided to the interfaces developed under this architecture, all IBM publications mentioned in this description can be used in conjunction with the CUA documentation.

Concepts of Multicultural Support

There are two concepts vital to understand multicultural support: *enable* and *implement*.

Enable

To *enable* a product means to design that product in such a way as to *facilitate* the inclusion of national language functions and to design a product in such a way as not to inhibit the inclusion and usability of national language functions in other products.

During the design stages of a product, the developer must keep in mind that the architecture and the design have to be flexible enough to allow national language functions or any specific language to be included in the product (possibly at a later time) without requiring a redesign.

Implement

To *implement* a national language on a product means to add national language functions to a product when the design has been *enabled* to accept those functions, as well as providing the customer and service information in the user's national language. Implementation refers to specific languages and to specific additions to a product.

Language Subsets

If languages are divided on the basis of their implementation characteristics, the rules and guidelines fall into subsets that naturally support those characteristics. By using all the subsets and guidelines, a designer ensures that a product is enabled for the national languages of all countries.

The following characteristics form the basis for creating subsets of the enabling rules and guidelines for written languages:

- Left-to-right languages using single-byte characters. For example, Danish, English, Finnish, French, German, Hungarian, Italian.
- Bidirectional languages using single-byte characters. For example, Arabic, Hebrew, Persian.
- Languages using double-byte characters. For example, Chinese, Japanese, Korean.

These groupings are based on practicality in data processing rather than linguistic reasons. For example, the bidirectional languages are set apart from the others by their common requirement for functions that permit handling of entry and presentation in two directions (right-to-left and left-to-right). Double-byte languages are distinguished by their requirement for more than one single byte per character to code their large character sets.

The first subset applies to left-to-right single-byte languages and contains the rules and guidelines that are common to all languages. It is considered a base for all products. The other subsets deal uniquely with the bidirectional and double-byte languages.

National Language Standards and Laws

There are many language-related standards and laws. Most countries have language laws affecting the importation, sale, or use of data processing equipment, software, or documentation. Some of the laws specify the language(s) to be used on labels, keyboards, documentation, or software. Other laws regulate cultural aspects such as date formats, calendars, or numeric representation. Because there are many laws and constant revision of laws, only the country issuing a law can describe it.

Some countries like Canada, Switzerland, and Belgium have legal requirements to support more than one official language.

Implementation Considerations

If you plan to include multicultural support in your software package, you have to consider many design and implementation aspects, for example:

- Which code page(s) are required;
- Which character sets are required;
- Isolation of language dependent hardware, and software code from executable code at the source, load module, and packaging levels;
- Definition of graphic characters as delimiters for control purposes;
- Definition of variables used in translatable material and its location and order within a field;
- Expansion space for translation (expansion is based upon complete words and blanks associated with those words; up to 10 characters English length require 100-200% while 70 characters or more English length require only 30% expansion space).
- Input formats such as commands, keywords and responses must accept English input formats in the same session as the multicultural input formats.

Multicultural Support for z/VSE Version 4

z/VSE Version 4 currently offers English and Japanese for the following products/functions:

- Interactive Interface
- Online Message Explanation (OME)
- Selected CICS end-user messages
- High Level Assembler for VSE messages

For the interactive interface and the OME, only one language can be used per installation. The customer chooses the language when ordering the product.

The interactive interface of z/VSE comprises panels, help panels, online messages, and help messages.

The OME allows to display the explanation of any message issued by one of the z/VSE base products in the customer selected language.

VSE Workdesk is a front-end to the interactive interface for workstation users.

DWF is an application development workplace for workstation users. It delivers all available languages, but it is recommended to use only the language that was chosen for the z/VSE host system.

CICS allows to select the language

- globally by using CICS initialization options
- for each end-user
- for each terminal or transaction

High Level Assembler for VSE allows to select the language for each assembly run.

Some end-user applications provide multilingual support. **All** languages may be installed in the system and the user selects the desired language.

Part 4. Creating Installation Tapes and Servicing Your Product

This part describes how to create installation tapes and how to service your product. Additional samples corresponding to the topics described here are given in Part 5, “Packaging and Service Samples,” on page 105.

Chapter 6. VSE Product Numbering Conventions

This chapter explains the IBM VSE product numbering conventions and helps vendors to avoid numbering conflicts at customer installations.

These numbers reflect the structure of your product and are required by the Maintain System History Program (MSHP) to ensure correct installation and service of your product.

MSHP is a program in VSE used for installing and servicing an IBM product. It is used for automating and controlling various installation and service activities for a VSE system. You can use MSHP to install your own products on VSE and to apply service to them.

Important: The structure influences how a product is installed and serviced. Therefore it is very important that you consider the structure of your product early in the development process. Refer to section "Rules for Product Structuring" on page 73 for a description of dependencies between product structure, numbering scheme, distribution tape creation, and installation.

MSHP Product Identification

For installation and service of a program, MSHP uses alphanumeric combinations that identify the product to MSHP. Here MSHP follows the standard IBM coding format for product identification. The identification format consists of the following parts, not necessarily used in this sequence.

Format

```
TTTT-PPP-CC-CLC
```

where:

TTTT
stands for a four digit numeric code. It is part of the order number and is referred to as **type**.

At present, IBM uses the range 5600 to 5799.

For example, in Table 5 on page 72, the type is 5686 and identifies a VSE product.

PPP
stands for a three letter alphanumeric code. PPP is part of the order number and is referred to as **model**. In the context of MSHP, the model is called **product code**.

The product code ranges from 001 to 998.

For example, as shown in Table 5 on page 72, the product code for VSE Central Functions Version 8 is CF8.

Note: MSHP accepts also alphanumeric combinations.

CC
stands for a two digit numeric code, the **component number**,indicating the component of a product.

The component number ranges from 01 to 98 within one product.

For example, as shown in Table 5 on page 72, MSHP is the seventh component of VSE Central Functions.

CLC
refers to the **Component Level Code**. The CLC identifies the release of a product within a version.

For example, in Table 5 on page 72, the component level code for components belonging to VSE Central Functions Version 8 Release 2 is 01C.

The following example shows numeric combinations that identify a product according to product name, product number, component ID, CLC, and product identifier to MSHP.

Note: This format is used for all IBM VSE products uniformly since VSE/Advanced Functions 2.1.

Table 5. Product Identification Convention Example

IBM Product	IBM Product Number	Component ID	CLC	Product ID (MSHP)
VSE/Cen. Func. 8.2.0 • VSE/POWER • MSHP	5686-CF8 5686-CF8 5686-CF8	 5686CF803 5686CF807	 01C 01C	 CF801C CF801C
CICS Transaction Server 1.1.1	5686-054	568605400	B0P	054B0P
WebSphere® MQ for z/VSE 3.0.0	5655-U97	5655U9700	300	U97300

MSHP uses some of these numeric combinations for installation, others for service procedures.

To create the distribution tape, both component ID and product ID are needed. The following section describes how these are constituted.

Component Identifier

The component ID identifies the component(s) of a product. For products to be serviced using MSHP, that is to install PTFs and APAR fixes (ZAPs), one component identifier has to be defined per component of a product. The component identifier is built from the program number followed by the component number. The basic format of the component ID thus is TTTT-PPP-CC.

Fully-qualified component identifier

In order to identify the component uniquely to MSHP, the component must, however, be specified in "fully qualified" format. Fully qualified means specifying both the **component ID** and the **release level** of the component. This is what the complete, fully qualified component ID format looks like:

```
TTTT-PPP-CC-CLC
```

The fully qualified component ID for MSHP, for example, is 5686-CF8-07-01C. This identifies MSHP as component 07 on level 01C of product 5686-CF8, which means VSE Central Functions Version 8.2.

A product usually consists of one component. Larger products, such as VSE Central Functions, contain several components or functional units; it has as its seventh component, for example, MSHP (Maintain System History Program). For products that contain more than one component, refer to “Rules for Product Structuring” on page 73 for MSHP requirements.

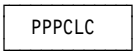
In summary, components refer to the structure of a product, which should carefully be considered. In general, one component should be sufficient, with the possible exception for multicultural support.

It is very important that you consider the structure of your products into components in time. The structure influences how a product is installed and serviced. Since PTFs are built for components, a large number of components may cause an increase in corequisite PTFs. For more information on corequisite PTFs, please refer to “Ensuring the Correct Environment” on page 96.

Product Identifier

The product ID identifies a product and its release level to MSHP for installation and service. It is the product ID that MSHP uses when referring to a product.

It is recommended that the product ID is in this format:



For example, the product ID for VSE Central Functions Version 8 Release 2 is CF801C.

The first three characters (CF8 in the example) are the product code. The remaining characters (01C in the example) identify the release level (CLC) of the program.

Note: MSHP supports multiple levels of a program. Note that:

- The PPP is changed with a new product version.
- The CLC is changed for a new product release.

Table 6. Changed Product ID through New Version and Release Level

IBM Product	VRM	Product Number	CLC	Resulting Product ID
MQSeries® VSE/ESA	2.1.1	5686–A06	1ZZ	A061ZZ
MQSeries VSE/ESA	2.1.2	5686-A06	2ZZ	A062ZZ
WebSphere MQ for z/VSE	3.0.0	5655-U97	300	U97300
Note: VRM = Version Release Modification				

Using the Component and Product Identifier

When writing MSHP jobs using the identifiers described above, follow these rules:

1. Use the product ID rather than the CLC alone if both specifications are possible in an MSHP statement. This holds true, for example, for the PRE parameter of the REQUIRES statement. Because CLCs are not always unique, a duplicate CLC might prevent application of a PTF or installation of a product; MSHP can not distinguish the different products using the same CLC.
2. Always use the fully-qualified component identifier in order to refer to a component on its correct release level.

Note: The identifiers used for product installation can't be changed by service.

Rules for Product Structuring

The following MSHP requirements must be considered when defining components:

- If a program consists of a group of components that **must be installed together** (like some components of VSE Central Functions), all components must have different component IDs, but the same CLC (and therefore the same Product ID). To create an install tape, the product (residing in one sub-library) is first defined to MSHP with one ARCHIVE statement for each component and one for the Product ID and then put to tape with one BACKUP Product ID statement. The product is installed with one install job.
- If a program consists of a base component (group of components) and a series of features, out of which **only one** can be selected (for example, a multicultural support feature), all components of the features can have the same component ID but must have different CLCs (one Product ID for the base and one for each feature). To create an install tape, the base and each feature (residing in different sub-libraries) are defined to MSHP with corresponding ARCHIVE component ID and ARCHIVE Product ID statements and are put to tape with separate BACKUP Product ID statements. The base and each feature are installed with different install jobs.
- If a program consists of a base component and a series of features, out of which **one or more** can be selected (for example, additional functions), all components must have different component IDs and different CLCs (one Product ID for the base and one for each feature). To create an install tape, the base and each feature (residing in different sub-libraries) are defined to MSHP with corresponding ARCHIVE

component ID and ARCHIVE Product ID statements, and are put on tape with separate BACKUP Product ID statements. The base and each feature are installed with different install jobs.

- If a component of a feature replaces a base component, the same component ID must be used for the base and for the feature, but the CLC must be different. At installation time MSHP issues a warning that the existing part will be overwritten.

Refer to Chapter 7, “Creating Installation Tapes,” on page 77 for details on creating installation tapes.

Convention for Vendor Product Identification

The purpose of this section is to

- Encourage the use of MSHP also for non-IBM products (makes life easier for customers and IBM service).
- Keep the vendor products from stepping on each others' and on our toes when they invent their own MSHP numbering scheme (which they did).

It is addressed at vendor products, completely independent of any IBM relation. Therefore these rules do not apply whenever a vendor product is subject of a cooperative marketing agreement or even closer relationship.

The previous sections explain the relationship between product number and all the MSHP numbers in the ideal case. That is, either it's an IBM product that has the same program number worldwide or a non-IBM product where the product owners set up their own program numbers, independent of IBM, and also worldwide. Such a program number serves as the base to derive in conjunction with a CLC the Product ID, component ID, and the fully-qualified component ID. In case of a vendor product with cooperative marketing agreements with different IBM country organizations, different IBM program numbers will be assigned in different countries. Then the - usually later - assigned IBM program number(s) will not resemble the component ID, which would be the same worldwide. Anything else would imply differently built distribution tapes for each of these countries.

Each product that works with VSE should have unique component and product identifiers. This applies to both IBM and vendor products. The following naming convention ensures this uniqueness for products worldwide. Identify your products as follows:

Type

The numbers 5600 - 5799 must **not** be used for type, since these numbers are reserved for IBM.

Model

Use a **V** as first character of your model/product code (PPP).

CLC

The CLC value used by IBM VSE products does not contain the letters **T**, **U**, **V**, **W**. Thus, these letters are available to vendors to identify their products. The first two characters of the CLC value identify the vendor (the third character can be chosen by the vendor, it can be A - Z, 1 - 9). The following two lists show CLCs assigned previously to European and American vendors. These CLCs should therefore not be used again in the future:

European vendors

```
TAx   ABACO INFORMATICA S.A., Madrid, Spain
TCx   ALPI  S.P.A., Milano MI, Italy
UTx   Alldata Software Haus, Stuttgart, Germany
TDx   Archetype System Ltd., Hatters Lane, Watford, Herts WDI 8YH, UK
TEx   ARTHUR ANDERSEN AND CO, London WC2R 3LT, UK
TKx   Becker Software GmbH, Wiesbaden, Germany
TFx   BTB Betriebswirtschaftliche u. Technische Beratungsgesellschaft mbH,
```

```
      Leinfelden-Echterdingen, Germany
TGx   Byte Software House S.P.A., Torino, Italy
TJx   CAP Debis SHI, Muenchen, Germany
TYx   CAP Debis OrganisationsPartner GmbH, Bad Oldesloe, Germany
TTx   CGI Interprogramm GmbH, Langenfeld, Germany
THx   CIOB, Eindhoven, Netherlands
UHx   Comparex, Mannheim, Germany
TIx   COTEC - LISTER PETTER LTD, GLOS  GL11 HS, UK
TLx   ERITEL, Madrid, Spain
TMx   Dipl.-Ing. Rainer Gehrke, Unternehmensberatung GmbH,
      Overath, Germany
TNx   H&M System Software GmbH, Roedermark, Germany
TOx   Ibias, PL Gouda, Netherlands
TPx   IKO Software Service GmbH, Stuttgart, Germany
TQx   Infologica, Stuttgart, Germany
TRx   Infosoft Deutschland, Weiherhof-Zdf., Germany
TSx   Insurance Software & Systems Ltd, Oslo 1, Norway
TUx   IPACRI  S.P.A., ROMA RM, Italy
TVx   Klumpp Informatik, Stuttgart 31, Germany
TWx   Lattwein GmbH, Dueren, Germany
TXx   LS3, London W1N 7RA, UK
VIx   Macro4, Worth, West Sussex, UK
TZx   ORBIT COMPUTER SYSTEMS, Manchester, M3 5LF, UK
T1x   Osys AG, Zuerich, Switzerland
T2x   QUALITY SOFTWARE PRODUCTS LTD LEATHERHEAD, KT22 7AH, UK
T3x   SAP AG, Walldorf, Germany
UJx   SAPIENS, Israel
TBx   Sema Group Systems AG, Wilhelmshaven, Germany
T4x   Sema Group, Bruxelles, Belgium
T5x   SIO, Montrouge, France
T6x   SISTEMI INFORMATIVI  S.P.A., ROMA RM, Italy
T7x   SLIGOS, Paris La Defense, France
T8x   Software AG, Darmstadt, Germany
T9x   Soleri - Cigel, Puteaux Cedex, France
```

```
UAx   STERIA, 78140 Velizy-Villacoublay, France
UBx   TIMEGATE COMPUTER SYSTEMS LTD, WALSALL WS9 0QD, UK
UCx   UNILOG RESEAUX et Systems, Paris 9, France
UDx   Update GmbH, Kulmbach, Germany
UEx   USU Softwarehaus Unternehmensberatung GmbH, Moeglingen, Germany
UFx   VOLMAC, 3511 GB Utrecht, Netherlands
UGx   Wilken GmbH, Ulm, Germany
```

American vendors

```
WOx   ALLTEL Inc. (Systematics Inc.), Little Rock, AR
VAx   Altai Software , Arlington, TX
WAx   American Management Systems, Inc., Arlington, VA
WBx   American Software, Atlanta, GA
W8x   APSIS Software, Inc., Columbus, OH
VBx   BI Moyle Assoc., Minneapolis, MN
VCx   BMC Software, Sugar Land, TX
VDx   Candle Corporation, Los Angeles, CA
WCx   Cincom Systems, Cincinatti, OH
VJx   Computer Associates Int'l, Islandia, NY
VKx   Computer Associates Int'l, Islandia, NY
VSx   Computer Associates Int'l, Islandia, NY
WUx   Cyborg Systems Inc., Chicago, IL
WDx   Data Design Associates, Sunnyvale, CA
W5x   Data Kinetics, Ltd., Ottawa, Ontario, Canada
WKx   Dun and Bradstreet, Atlanta, GA
WEx   Genesys Software Systems, Methuen, MA
WFx   Global Software, Raleigh, NC
WVx   H & W Computer Systems Inc., Boise, ID
WXx   Healthquest, Atlanta, GA
WYx   Information Associates, Inc., Rochester, NY
WGx   Information Builders, New York, NY
WHx   Information Sciences Inc. (INSCI), Montvale, NJ
WIx   Information Systems of America (ISA), Atlanta, GA
WZx   Integral Systems, Inc., Walnut Creek, CA
VFx   IntelliWare Systems, Inc., Dallas, TX
WWx   Kirchmann Corp., Orlando, FL
VGx   Landmark Systems, Vienna, VA
WJx   Lawson Associates, Minneapolis, MN
VEx   Legent Corp., Vienna, VA
VQx   Legent Corp., Vienna, VA
VHx   Mac Kinney Syst., Springfield, MO
WSx   Micro Tempus Inc., Montreal, Ontario (Canada)
```

```
W9x   Open Connect Systems, Dallas, TX
W7x   Open Software Technologies, Longwood, FL
W1x   Performance Software, Inc., Richmond, VA
WTx   Phoenix Software Co., Los Angeles, CA
WMx   SAS Institute, Cary, NC
VLx   SDI, San Mateo, CA
WRx   SDM International Inc., Fuquay Varina, NC
VMx   Smartech Systems, Inc., Dallas, TX
W2x   Software Diversified Services, Minneapolis, MN
VOx   Software Engineering of America, Atlanta, GA
WNx   SPSS Inc., Chicago, IL
VNx   Sterling Software, Chatsworth, CA
VRx   Sterling Software, Chatsworth, CA
VPx   Syncsort, Woodcliff Lake, NJ
VTx   HFD Technologies, Blackwood, NJ
W6x   SysData International, Inc., Hoboken, N.J. USA
WPx   Thorn EMI Computer Software, Chelmsford, MA
W4x   UNITECH Systems, Inc., Lisle IL  USA
WQx   Walker Interactive, San Francisco, CA
W3x   Xerox Computer Services, Los Angeles, CA
```

Deviations

Blueline Software
uses: 1000-XXX-WE-YYY. 1000 and WE identify Blueline Software. XXX and YYY are internal code different by product and release.

Computer Associates International
uses: 0202-CA-...

Legent Corporation, formerly Goal Systems International, Inc.
uses: 7965-XXX-00-YYY and 1989-XXX-00-YYY 7965/1989 and 00 identify Legent Corporation, XXX identify the product and YYY the release.

Open Software Technologies
uses: 2822-V..-..-W7.

Sapiens
uses: 1818-V..-..-UJ.

Software Pursuits Inc.
uses: 1975-XXX-01-YYY. 1975 and 01 identify Software Pursuits Inc. XXX and YYY are internal code different by product and release.

Request and updates for CLC numbers

Please use the address listed on the Reader's Comment Form to mail CLC number requests.

Chapter 7. Creating Installation Tapes

This chapter describes how to prepare a distribution tape for a VSE product. Here the objective is:

- To facilitate installation by VSE customers. This requires an understanding of how IBM tapes are installed and serviced by MSHP.
- To simplify procedures for customers familiar with IBM conventions.

Note: The structure of a product defines the layout of a product distribution tape and the product installation and service process. Therefore it is important that the implications of a product structure are already considered as part of the product design. Refer to "Rules for Product Structuring" on page 73 for a description of dependencies.

Creating a Product Distribution Tape on VSE

A distribution tape must conform to the tape layout as described below if you want to achieve the following:

- The product can be installed using MSHP.
- The product can be installed using the VSE product installation and service dialogs.
- The product can be serviced by PTFs.

System Requirements

A distribution tape for installation on a VSE system must be built on a VSE system.

Preparing a Library

Creation of a product tape requires preparation of the VSE library. Follow these steps to prepare the VSE library for installation of your distribution tape:

1. Create your library.

   You can create a library in either of the following ways:

   - As a sequential file. For an example, please see "Creation of a Library on a Sequential Disk Extent" on page 107.
   - **Or** as a file in VSAM-managed space. This lets you use dialogs. For an example, please see "Definition of a Library in VSAM Managed Space" on page 107.

   Note: Creating a library is optional if you use an existing library.
2. Create a sublibrary that contains the code. You can create a sublibrary in either of the following ways:

   - By using the dialogs
   - **Or** by going into the ICCF command mode and using LIBR.

   The name of the sublibrary should be unique for your and also for the customer's installation. Using the following naming conventions ensures uniqueness:

   for *production part*: `aaa.PRprod-id`
   for *generation part*: `aaa.Gnprod-id`
   where:
   `aaa`= library name
   `prod-id`= product ID
   n = 1 through 9, depending on the number of generation sublibraries.

3. Compile or assemble the source code of the product. Catalog the object modules into the sublibrary you just created. This sublibrary is the production library. It contains everything that is necessary for running and servicing your product.

   Points to Remember:

   - All members should have names that identify them uniquely as part of the product. This is achieved within IBM by assigning three characters to a product. These characters are called the Component Code. Names of modules, phases, or also a reserved file name for a disk file should start with these characters.

     For example, all VSE/POWER modules start with IPW.
   - If the product includes Librarian source members, select the correct member type from the list in Chapter 11, “Library Member Types,” on page 119.
   - If you are not using the High Level Assembler for VSE, executable macros have to be processed with the EDECK option of the assembler. With High Level Assembler for VSE, E-decks are no longer used. However, for compatibility reasons, the EDECKXIT parameter is available, which allows High Level Assembler for VSE to translate E-decks back to A-books before processing.

     Notes:

     a. Macros can only be modified in A-book format.

     b. High Level Assembler for VSE cannot convert A-books to E-decks.

     Refer also to the library member type E in Chapter 11, “Library Member Types,” on page 119.
   - Your code should include such items as installation material and data files, because all non-library data has to be handled separately.

   Optional:

4. - If your program includes a generation part to be compiled on the customer site for better adaptation to the customer environment, carefully catalog this material into a separate generation sublibrary.You may use more than one sublibrary (only if the generation part does not fit on one volume of the smallest DASD supported by VSE); this should be avoided when possible. This generation library need not be installed in the production environment, saving disk space.

     For example, the generation feature of VSE/Advanced Functions includes all macros needed to generate the supervisor.
   - Do not use a generation library for shipping code that is needed for service of the production part.
5. Link your product invoking the linkage editor.

   Compiling or assembling transforms your program into object module(s) that are then cataloged into the sublibary.

   If your program is independent of other programs, you may also link it and ship only phases. Linking at the customer's site is then not required. In this case, only the phase must reside in the sublibrary used for creating the tape. Note that service must then be done for phases, that is, PTFs must contain phases not object modules.

   In case your program needs other programs, for instance CICS modules, you could still link your program with one level of CICS. Then you would ship all phases including those object modules that need relinking with the version of CICS installed at the customer's site. In this case, supply LINK books.

Creating the Header

For each product (installable unit) create a header and catalog it into the sublibrary that contains the code. Follow these steps to create the header and catalog it:

1. Use the letters "HD" followed by the product ID to compose the **header name**, that is, use HDPPPCLC.
2. Write the content of the header file to be as follows:

- 80 byte records that can contain any text. For IBM products these records contain the copyright records, or a repetition of those records if more than one copyright notice is required.

  The format of the text record is:

```
col 1 - 6      HDR001
col 7 - 8      sequence number (01 to 99)
col 9          blank
col 10-71      text (see example)
col 73-80      optional card sequence number
```

- One end indicator record.

  The format of the end record is:

```
col 1 - 6      HDR099
col 7 - 8      sequence number (01)
col 9          blank
col 10-12      END
col 13-71      not used
col 73-80      optional card sequence number
```

Example of the content of a header file:

```
CATALOG HDCF8.Z  REPLACE=YES        /* CATALOG HEADER FILE*/
HDR00101  LICENSED MATERIAL - PROPERTY OF IBM
HDR00102  5686-CF8 (C) COPYRIGHT IBM CORPORATION  2005
HDR00103  ALL RIGHTS RESERVED.
HDR00104  US GOVERNMENT USERS RESTRICTED RIGHTS -
HDR00105  USE, DUPLICATION OR DISCLOSURE RESTRICTED BY
HDR00106  GSA ADP SCHEDULE CONTRACT WITH IBM CORP.
HDR09901  END
/+
```

Note: IBM developers should check Corporate Standard C-S 0-6045-002 for the latest wording of the copyright statement.

3. Catalog the header file as a member of type "Z" into your sublibrary using the following job:

```
// JOB HEADER
// EXEC LIBR
   ACCESS  SUBLIB=lib.sublib
   CATALOG member.Z
      ... source of member.Z
/+
/*
/&
```

Creating the History

Once the header has been created, the next step is to create the product's history file using MSHP.

Follow these steps to create a history file:

1. Check that you meet the requirements to create a history file, which are:
   - disk space (non-VSAM)
   - product identification

   For product identification requirements, see “MSHP Product Identification” on page 71.
2. Write the MSHP job to create the history file.
3. Execute the MSHP job.

Example for creation of an MSHP history file

```
// JOB ARCH2ZZ
* ******************************************************
* ARCHIVE JOB FOR MQSeries 2.1.2                       *
* ******************************************************
// ASSGN SYS017,DISK,VOL=MQS212,SHR
// EXEC MSHP,SIZE=1024K
CREATE HISTORY SYSTEM
DEFINE HISTORY SYSTEM UNIT=SYS017 EXTENT=0705:15 -
      ID='MQSERIES 2.1.2 BASIC.HISTORY'
ARCHIVE 5686-A06-00-2ZZ             /* FULLY-QUALIFIED COMPONENT-ID */
ARCHIVE A062ZZ                      /* PRODUCT-ID                   */
COMPRISES 5686-A06-00 MACROS=(CMQ*,COPYR,MQICMD) TYPE=C
COMPRISES 5686-A06-00 MACROS=(CMQ*,MQI*) TYPE=H
COMPRISES 5686-A06-00 MACROS=(CMQ*) TYPE=P
COMPRISES 5686-A06-00 MACROS=(MQB*,MQC*,MQD*,MQJ*,MQS*,TT*) TYPE=Z
COMPRISES 5686-A06 00 MODULES=(MQB*,MQC*,MQD*,MQP*,MQS*)
COMPRISES 5686-A06-00 PHASES=(DCH*,MQB*,MQM*,MQP*,MQW*,TTM*,TTP*)
RESOLVES 'MQSERIES 2.1.2 - 5686-A06'
RESI PROD=A062ZZ PROD=PRD2.MQS212
/*
/&
```

Figure 6. Creating a History File

This MSHP job contains the following major parts:

CREATE HISTORY
The extent information for the history file is supplied in either of the following ways:

- Using the MSHP DETAIL CONTROL statement with DEFINE (as shown in the sample)
- **Or** using the DLBL and EXTENT statements for file name IJSYSHF

ARCHIVE component
This ARCHIVE statement describes your component to MSHP.

In our example the component is: 5686-A06-00-2ZZ .

ARCHIVE product
This ARCHIVE statement describes your product and is used to enter this information into the history file.

In our sample the product ID is: A062ZZ.

RESOLVES
The MSHP RESOLVES statement associates here a comment with a product.

In our example the comment is: MQSeries.2.1.2 - 5686-A06.

The first 16 characters of the RESOLVES statement must correspond to the tapefile ID as specified in the BACKUP job and is coded as shown on “Creating the Tape” on page 81.

The first 16 characters of this comment are used by the Service Dialogs as a nickname for the installed product.

COMPRISE
The COMPRISE statement is used to specify the component, phases, modules, and/or macros that make up a product. That information is entered into the history file.

The above sample uses generic COMPRISES rather than listing each member separately. Use generic COMPRISES whenever possible. The definition must, however, be unique across all products.

COMPRISE statements for macros are repeated for different macro types. Please refer to Chapter 11, “Library Member Types,” on page 119 for a list of macro types that are allocated for specific use.

Note: Procedures and library members of type .PROC cannot be specified and serviced by MSHP. But you may ship them in the sublibrary of your product.

RESIDENCE
The RESIDENCE statement defines the names of the production sublibrary or production and generation sublibraries in which a product resides. This information is recorded in the history file for any follow-on activities, such as service application, installation, or product backup.

Restrictions

- Use the INVOLVES LINK command only if the user does not have to relink after, for example, compiling some modules or adding other libraries. Else, if a link is required for product activation, a LINK job should be provided and mentioned in your Program Directory and/or z/VSE Installation documentation.
- Reduce requisite information to a minimum. Do not build MSHP REQUIRES statements into your job except when creating the history file for a feature.

For additional samples of how to build a history file, see "Creating or Changing VSE/Advanced Functions History Information" on page 109.

Creating the Tape

Now that you have prepared everything for building the tape, this is how you create the tape:

1. Write your MSHP BACKUP job. For a sample see below.
2. Execute the job.

Example for an MSHP BACKUP job

```
// JOB MQSBASE
* $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
* BACKUP  JOB FOR MQSeries 2.1.2                                      *
* $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
// ASSGN SYS017,DISK,VOL=MQS212,SHR              /* MQSeries HISTORY */
// PAUSE TAPE M1669 ON 570 MOUNTED? ---> PRESS ENTER, IF MOUNTED.
// ASSGN SYS006,570,D0
// EXEC MSHP,SIZE=1024K
BACKUP PRODUCT=A062ZZ                            -
       ID='MQSERIES...2.1.2'                     -
       HEADER=HDA062ZZ                           -
       PRODUCTION
DEF HISTORY SYSTEM                               -
       EXTENT=0705:15 UNIT=SYS017                -
       ID='MQSERIES 5686-A06 2.1.2 BASIC.HISTORY'
/*
/&
```

Figure 7. MSHP BACKUP Job

The MSHP BACKUP job contains the following major parts: JCL and BACKUP PRODUCT.

JCL

- Assign the distribution tape as SYS006.
- Provide ASSGN, DLBL, and EXTENT for the system history file. Usually, this is already available in the partition setup.
- Provide ASSGN, DLBL, and EXTENT for the selected library and LIBDEFs.

BACKUP PRODUCT
This statement is used to create the tape. It writes the header, the history file, and the product sublibrary onto tape.

The BACKUP PRODUCT statement has the following values:

- The value of PRODUCT is the product ID as used in the ARCHIVE product statement when creating the history file in Figure 6 on page 80. In the sample this value is A062ZZ.
- The value of ID is the tapefile ID and is coded as follows:

It is 16 characters long. The first characters contain the product name or a suitable abbreviation of it; the product name is followed by a "." (dot), followed by the product's version, release, and modification level. Spaces not occupied by a character **must** be filled up with "." (dots).

In general, the first 10 characters contain the product name; the eleventh character is a "."(dot); the last 5 characters indicate the product's version, release, and modification level, separated by "."(dots).

In the sample this value is MQSeries...2.1.2

If the product's version, release, and modification level occupy more than 5 characters, the product name must be abbreviated. For example, XY/370BA.27.53.0 .

WARNING: The tapefile ID must **not** contain any blanks.

Note: The tapefile ID is used by the installation dialogs. It may be specified in an INSTALL job and should correspond to the first 16 characters of the RESOLVES statement when creating the history file.

- The header is the one created for this product. In the sample the header is HDA062ZZ.
- The statement specifies the type of the library to be copied. In the sample it is PRODUCTION only.

Optional: Specify the DEFINE HISTORY statement only if you do **not** have the DLBL and EXTENT statements for the history file (IJSYSHF) in your standard label sets. The file information is the same as specified when creating the history file, see Figure 6 on page 80.

Resulting Tape Layout of the Product

As a result of the BACKUP job, the product is written to tape in the following format:

Table 7. Layout of a Distribution Tape

File Number	Content	Sample
1	header file	HD022A10
2	product history file	history file for product 022A10
3	product libraries	DW202DA.PR$A10
4	null file (tape mark)	null file
5	EOB (end of BACKUP information)	EOB
6	null file (tape mark)	null file

File 3 of the product distribution tape contains library data only.

Related installation material and other material should be packaged as library data, if possible. The VSE Librarian provides support for shipping executable, parameterized procedures within a VSE library, eliminating thus the need to package customizing and activation jobs as non-library data.

Shipment of Non-Library Material

Products may ship non-library material on a non-stacked distribution tape as additional files **after** the library/history BACKUP copy. Examples are:

- Copies of VSAM files
- Machine readable documentation
- Non-serviced material.

Observe the following for shipment of the distribution tape:

- Installation of these additional files on the distribution tape is not supported by the install dialogs.
- Installation of such additional files on the distribution tape must be possible through functions supplied by either of the following:

  - VSE/Advanced Functions (for example, system utilities)
  - The product itself (for example, ICCF DTSUTIL function for ICCF library)
  - Products that are prerequisite to the product
- At present, no service method exists for these extra files. In addition, MSHP does not control the content and level of such files.

  To solve this, the material of some products is shipped as source statement library members. For example, ICCF library members are shipped as I-books and then moved into the appropriate dataset at installation time.

Creating a Feature Tape

A feature is a separate unit requiring a base product for installation. For identification to MSHP, a feature uses the following numbering convention:

- A feature uses the same program number as that of the base product.
- A feature is identified by its own, unique component level code (CLC).
- A feature has its own component ID. Otherwise, MSHP would treat the feature as a new release of the base product.

The following example illustrates the numbering convention for a base product in relation to one of its features.

Table 8. Coding Convention Example for a Base Product and a Feature

	Component ID	**CLC**	**Product Code**	**Product ID**
Base Product	5686-007-01	C44	007	007C44
Feature	5686-007-02	C45	007	007C45

Warning: This definition of a feature is strictly in terms of MSHP. Feature and feature code as used for distribution or ordering may consist of one or more features by MSHP definition.

The distribution tape for a feature is created in the same way as for a product, described in section “Creating a Product Distribution Tape on VSE” on page 77. The only difference is when creating the history file. The statement **REQUIRES PRE=prod-id of the base product** is added to the job. For an example, see “History Information for a Feature of a Product” on page 110.

Creating a Tape for Selective Installation of a Product or Feature

At times, a customer wants to select parts of a product rather than installing the entire product on the distribution tape. For example, translated Machine Readable Information (MRI) consists of panels, helps, and messages translated into 15 or more languages. Installing all of the languages occupies a large amount of disk space. Thus, in an attempt to save disk space, a customer may choose to install only some of the languages offered.

While the customer may want to install some selected languages, the product owner may prefer to ship all languages on one tape. The following approach describes how you can build a distributiontape satisfying both needs. Requirements are:

- Each part of the product that can be selected must be a feature according to MSHP standards:
  - The component identifier(s) of these features must be different from the component identifier of the base product. Likewise, every feature must have a unique CLC.
  - Whether one component identifier is used for all of the features or whether every feature has its own identifier depends on the usage:

    If the user should be able to select more than one of the different selectable features, then each of them must have unique component identifiers.

Note: MSHP checks the component identifier when executing the INSTALL command. If it finds the same component identifier with a different CLC installed, it assumes a new release of the same product and overwrites the previous information. Because of this, the customer can select only one feature from the offered choice of, for example, language support. This is contrary to the multilingual option offered by some products.

The recommended approach for such cases is, therefore, to have one component identifier per selectable feature. This enables a customer to select more than one, but not necessarily all, of the available language support.

The tape layout is the same, whether the different features comprise the same component identifier and different CLCs, or whether the component identifiers are also different.

- Each feature must reside in a separate sublibrary, have its own header and history file.

Create the history files in either of the following ways

1. Write one job per feature following the steps described in "Creating the History" on page 79 and execute the job.

   Or

2. Join all these separate jobs as job steps into one job. Use the /& only at the end of the complete job. Execute the job.

For a sample see "History Information for a Product Consisting of Multiple Components Installed Selectively" on page 114.

Create the tape

1. Write the MSHP BACKUP statement for backup of the first feature and end it by a /*.
2. This should be followed by the job step for the backup of the next feature.
3. This should be repeated as often as necessary.
4. Put a /& at the end.

For a sample job, see "Back up a Product or Feature for Selective Installation" on page 117. Note that you follow the same steps as for creation of a single product, except that the End-of-Job statement occurs only at the end.

As a result of the BACKUP job, the product is written to tape in the following format:

Table 9. Tape File Content for Selective Installation

File Number	Content
1	header language 1
2	history language 1
3	library-backup for language 1
...	...
3m + 1	header language m
3m + 2	history language m
3m + 3	library backup for language m
3m + 4	null file (tape mark)
3m + 5	EOB (end of BACKUP information)
3m + 6	null file (tape mark)

Shipping VM Code with a VSE Product

Products may consist of two parts: the program to run on a VSE host and a counterpart in VM. VM files: z/VSE Unique Code (UC) uses .Z for this purpose. UC prepares the members by doing the following:

- Diskdump the program to a user's reader.
- Load the members with READ so that they are on disk in disk dump format.
- Wrap the catalog statement around them and catalog them as Z members in the VSE library.
- Transfer the members from VSE to VM as described in the z/VSE Installation documentation, under "VM/VSE Interface" in the index; VSE supplies a skeleton in ICCF 59 SKVMVSE that uses DITTO.

If you used the same approach, you need to ship your skeleton with member type .I and appropriate ICCF commands wrapped around it. ICCF lib 62 is used for optional products.

Shipping PC Code with a VSE Product

Products may consist of two parts: the program to run on a VSE host and a counterpart program to be executed on a Personal Computer (PC). For these products VSE supports distribution of the PC code as part of the product on a normal VSE distribution tape. Then it is possible to download this program on to the PC when the product has been installed on VSE. Depending on the VSE system your product is intended for, you have several possibilities to download your product onto the PC. For more information see Chapter 14, “Shipping PC Code with VSE,” on page 131.

Tape Stacking

In order to reduce the number of tapes to be shipped, IBM stacks more than one VSE Optional Product on one tape. Whenever you want to package different products into one offering, you can use this method of stacking tapes.

Stacked tapes can be installed using the installation dialogs of VSE.

Format of a Stacked Tape or Cartridge

The format of a stacked tape or cartridge is as follows:

- A special header (start-of-stacked-tape indicator) comes before the first product on the tape.
- Each product tape appears as previously described; one product following the other.
- A special trailer (end-of-stacked-tape indicator) appears after the last product on tape.

The following figure shows the layout of a stacked tape or cartridge:

Table 10. Stacked Tape and Cartridge Format

Header	tape mark start-of stacked-tape indicator record (see description below) tape mark

Table 10. Stacked Tape and Cartridge Format (continued)	
Product 1	FILE 1 - HEADER FILE FOR FIRST PRODUCT tape mark FILE 2 - MSHP HISTORY FOR FIRST PRODUCT tape mark FILE 3 - PRODUCT LIBRARY FOR FIRST PRODUCT tape mark FILE 4 - NULL FILE tape mark FILE 5 - END OF BACKUP RECORD FOR FIRST PRODUCT tape mark FILE 6 - NULL FILE
Following Products	... ... Repeat files 1-6 for all products to be stacked ... ...
Trailer	tape mark end-of-stacked-tape indicator (see description below) tape mark
End of File	tape mark

Format

The format of the START OF TAPE and END OF TAPE indicator is as follows:

1. tape mark
2. 80 byte record
3. tape mark

Table 11. Layout of the 80 Byte Record for START OF STACKED TAPE Indicator		
Byte	**Type**	**Content**
00-01	hex	x'0050'
02-03	hex	x'0000'
04-07	hex	x'00000001'
08-44	char	c'START.OF.STACKED.TAPE.FOR.VSE/SP.ONLY'
45	char	c' ' (1 blank)
46-79	hex	34x'00'

Table 12. Layout of the 80 Byte Record for END OF STACKED TAPE Indicator		
Byte	**Type**	**Content**
00-01	hex	x'0050'
02-03	hex	x'0000'
04-07	hex	x'00000001'

Table 12. Layout of the 80 Byte Record for END OF STACKED TAPE Indicator (continued)		
Byte	**Type**	**Content**
08-42	char	c'END.OF.STACKED.TAPE.FOR.VSE/SP.ONLY'
43-45	char	c' ' (3 blanks)
46-79	hex	34x'00'

The format of the two indicators is the same. The difference consists in the text of the character string from byte 8 to byte 45.

Product Stacking Requirements

Observe the following when creating a stacked tape:

- Use multiple stacked tapes or cartridges only if the number of products do not fit on one physical tape or cartridge.
- If the number of products requires more than one stacked tape or cartridge, products must not span tape or cartridge volumes. Each stacked tape or cartridge must contain the "Start of Tape Indicator" and the "End of Tape Indicator".
- A product requiring another product (which means REQUIRES PRE=prod-id) must follow the required product on the tape. Thus, a product must be stacked before any of its feature(s).

Creating a Stacked Tape

VSE Optional Products are stacked by the IBM distribution centers. For non-IBM products the tape/cartridge stacking process is achieved in either of these ways:

Method 1

Produce a stacked tape by creating the tape.

1. Copy the START OF TAPE indicator to your stacked tape or cartridge following these steps:
   a. Write a tape mark
   b. Write the begin indicator record
   c. Write a tape mark

   Note: Do not rewind the tape.
2. Copy the program(s) to your stacked tape or cartridge. Here follow these steps:
   a. Write the first product to tape using the same back-up job you would also use for creating this product's distribution tape.

      Follow this using the job control statement **// MTC FSF,SYS006,2**. The BACKUP function of the Librarian positions the tape at the end-of-block file written last.

      Do not rewind the tape.
   b. Repeat this procedure for the next product(s) as often as necessary.
   c. Copy the END OF TAPE indicator to your stacked tape or cartridge. Here follow these steps:
      i) Write a tape mark
      ii) Write the end indicator record
      iii) Write a tape mark
   d. Write a tape mark.

Method 2

Produce a stacked tape by copying the different parts.

1. Prepare the different distribution tapes as described under “Creating a Product Distribution Tape on VSE” on page 77.
2. Get the correct header and trailer from an existing stacked tape.
3. Use DITTO to copy header, products, and trailer in the correct sequence.

Summary
Consider this for installation and service of your product:

- Have your tapes conform to the IBM numbering convention standards for product identification.
- Have your tapes conform to the IBM distribution tape layout.

More Information
Refer to the following IBM manual for detailed information on JCL and MSHP statements:

- z/VSE System Control Statements

Chapter 8. Installing and Customizing Your Product

Installation

This chapter describes the VSE installation tools for tapes built according to the specifications outlined in Chapter 7, “Creating Installation Tapes,” on page 77.

There are two ways to install your tape on VSE:

1. You can install your tape using the VSE installation dialogs.

   or

2. You can install your tape writing your own MSHP INSTALL job.

Both ways require you to decide which library and sublibrary/ies should receive the product. Both approaches are outlined below.

Using the VSE Installation Dialogs

The VSE dialogs support the installation process, regardless of whether the distribution tape contains one product, one product from which parts can be selected, or several products on a stacked tape-- as long as the tape is built as described in Chapter 7, “Creating Installation Tapes,” on page 77.

For detailed installation information refer to the z/VSE Installation manual that corresponds to the level of VSE that is installed.

Using an MSHP Install Job

If you install a product from tape using an MSHP install job, follow these steps:

1. Select or create a library and select or create a sublibrary in which the product is to be installed.

   For a description see “Preparing a Library” on page 77.

2. Copy the MSHP install job as provided in the product's Program Directory or in the z/VSE Installation manual and tailor it to the requirements of your installation.
3. Execute the job.

Installing a Tape with One Product

The install job consists of job control and MSHP statements.

- For job control:
  - Assign the distribution tape as SYS006.
  - Provide ASSGN, DLBL, and EXTENT for the system history file. Usually, this is already available in the partition setup.
  - Provide ASSGN, DLBL, and EXTENT for the selected library and LIBDEFs. Usually, this is already available in the partition setup.
- For MSHP statements, use the **INSTALL PRODUCT FROMTAPE** statement with the following parameters:

  PRODUCTION INTO=lib.sublib
  specifies the name of the library and sublibrary.

  The value of PRODUCTION INTO is the name of the sublibrary the product is written into.

  In our example (Figure 8 on page 90), the value of PRODUCTION INTO is PRD2.MQS212.

GENERATION INTO=lib.sublib
specifies the name of the library and sublibrary package.

In our sample no generation library is needed.

Note: If you do not specify a library, MSHP takes the library or sublibrary used in the RESIDENCE statement as default.

Optional:

ID=
tapefile ID

If used, the value of ID must be the same as coded in the BACKUP job creating this tape. MSHP scans the tape (forward only) for this ID.

If not specified, MSHP restores the product found on the tape on SYS006.

In the example, the value of ID is MQSERIES...2.1.2 .

Example

```
// JOB MUEINSTB
* INSTALL THE MQSERIES 2.1.2 BASE FROM TAPE, NO ADD. DICTIONARIES
// PAUSE TAPE WITH MQSERIES 2.1.2 BASE MOUNTED
// ASSGN SYS006,570
// MTC REW,SYS006
// EXEC MSHP,SIZE=1024K
INST PRODUCT FROMTAPE ID='MQSERIES...2.1.2'  -
             PROD INTO=PRD2.MQS212
/*
/&
```

Figure 8. Installing from a Tape with One Product

Installing a Tape with One Product but Parts to be Selected

For this selective install, you can use the same job as used for a tape with one product. In this case, however, you **must** write one install statement per part selected including the tapefile ID.

The INSTALL statements must be placed so that all products are installed in the same sequence as stored on the tape, if they are to be installed in one run. MSHP scans the tape for the specified tapefile ID, but only in forward direction.

Products that are REQuired by other products **must** be installed prior to the REQuiring product. This explains the requirement to BACKUP a product in the correct installation sequence.

Example

```
// JOB INSTALL QMF/VSE
* ****************************************************************
* INSTALL JOB FOR QMF/VSE 7.2.0 FROM TAPE, 2 ADDITIONAL LANGUAGES *
* ****************************************************************
// PAUSE TAPE WITH QMF/VSE 7.2.0 BASE MOUNTED?
// ASSGN SYS006,570
// MTC REW,SYS006
// EXEC MSHP,SIZE=1024
INST PRODUCT FROMTAPE ID='QMF/VSE....7.2.0'      -
             PROD INTO=PRD2.QMF720
INST PRODUCT FROMTAPE ID='QMF/VSE.D..7.2.0'      -
             PROD INTO=PRD2.QMF720
INST PRODUCT FROMTAPE ID='QMF/VSE.F..7.2.0'      -
             PROD INTO=PRD2.QMF720
/*
/&
```

Figure 9. Installing a Tape with One Product with Three Parts Selected

Installing from a Stacked Tape

When installing products from a stacked tape, use the same job as used for a tape with parts that are selected including the tapefile IDs.In this case, however, MSHP is called using the following statement:

```
//  EXEC  MSHP,SIZE=1024K,PARM='PIDSTACKED'
```

Example

```
// JOB INSTALL QMF/VSE
* ********************************************************************
* INSTALL JOB FOR QMF/VSE 7.2.0 BASE / US ENGLISH and 3 ADDITIONAL*
* LANGUAGES FROM A z/VSE OPTIONAL PRODUCT TAPE                     *
* ********************************************************************
// PAUSE STACKED TAPE WITH QMF/VSE 7.2.0 BASE AND NLS MOUNTED?
// ASSGN SYS006,570
// MTC REW,SYS006
// EXEC MSHP,SIZE=1024,PARM='PIDSTACKED'
INST PRODUCT FROMTAPE ID='QMF/VSE....7.2.0'      -
             PROD INTO=PRD2.QMF720
INST PRODUCT FROMTAPE ID='QMF/VSE.D..7.2.0'      -       /* GERMAN  */
             PROD INTO=PRD2.QMF720
INST PRODUCT FROMTAPE ID='QMF/VSE.F..7.2.0'      -       /* FRENCH  */
             PROD INTO=PRD2.QMF720
INST PRODUCT FROMTAPE ID='QMF/VSE.K..7.2.0'      -       /* JAPANESE*/
             PROD INTO=PRD2.QMF720
/*
/&
```

Figure 10. Installing Products from a Stacked Tape

Customizing

Most products require customizing after having been installed from the distribution tape. Customizing means tailoring the product after installation to the customer's specific requirements. The following is a likely list of items to be considered for customizing.

Avoiding Customer Compilation of Source Code

A software product should be delivered in compiled format regardless of whether or not the source code is delivered. If the source code alone is delivered, the compilation of the source code requires unnecessary time and effort from the customer. Moreover, if you ship source code only, the service must be done in form of the source code; again, this requires customers to compile and link.

Certain customers want to change the source code to meet their needs, in which case a recompilation of certain modules by the customer might be necessary. Keeping this possibility in mind, it is useful to provide customers with the right parameters and exit routines.

Customizing Tasks for the Product

Once the product is installed, the customizing tasks should be performed. The following is a typical list of such tasks.

- Defining and loading one or more VSAM files
- Creating or updating CICS tables
- Setting up the InterSystems Communications (ISC)
- Setting up the user profiles. This includes use of translated panels and messages of one or more languages
- (Re)linking the product
- Adapting the startup job for the product
- Migrating information from an earlier version or release of the product

Writing Customizing Jobs

Software products should contain jobs that customize the product for different installations.

Beginning with VSE/SP Version 2, the following facilities are available for writing customizing tasks:

- Symbolic parameters can be used as variables in the job control language statements. Values can be assigned to the symbolic parameters by the SETPARM statements. Note that SETPARM statements cannot be used to supply values to non-JCL statements.
- It is possible to follow different sequences of job steps depending on the return codes using the Conditional Job Control Language of VSE/Advanced Functions.
- Chapter 15, “Job for Customizing,” on page 133, contains as a sample the first part of a customizing job. This job was actually provided for an IBM product and uses the above mentioned facilities. This sample demonstrates the following points:
  - The sequence of job steps is structured **according to the tasks**.

    Conditional Job Control statements serve to combine the different job steps.
  - The information for the user is put at the beginning as a JCL comment, guiding the user how to adapt the job to this particular installation.
  - Variables are used where the user has to supply the values for their particular installation, for example library names. A table in the comment summarizes name, type, default, and description of the parameters. The necessary SETPARM statements are placed right after the explanations. See the section of the comment, headed Start of Parameter List (User Selection), as shown in Figure 43 on page 133.
  - Values in non-JCL statements that may have to be changed for the customer installation are also summarized, along with information on what and how to change.
  - Defaults are provided for

    1. The installation environment, assuming a VSE system as shipped by IBM, as seen, for example, from the library and sublibrary names.
    2. Reasonable sized disk work files accommodating more than one user.

  The result is an operational product that does not need elaborate calculations and tuning as a first step. Tuning can be performed at a later time if necessary. Different steps of the original customizing job may then be reused.

Use of REXX/VSE

REXX/VSE is part of the VSE Base System and can be used to tailor the VSE operating system instead of using the VSE conditional job control language. You can use REXX/VSE in the z/VSE batch environment for:

- z/VSE operation automation
- Substitution and parameterization for job execution
- Direct communication to the z/VSE system console
- Input/output (I/O) operations to z/VSE libraries and sequential data sets
- Dynamic creation and execution of z/VSE job streams
- VSE/POWER job submission and controlling
- VSE/POWER queue element manipulation
- VSE/POWER command execution.
- JCL command execution
- VSE batch program invocation (LIBR, IDCAMS, LNKEDT, ASSEMBLER,..)
- Invocation of high-level programs such as PL1 or C.
- SYSIPT data routing to REXX stems
- Output routing to a REXX stem

- REXX message routing
- Retrieval of some kind of VSE system information

More information
Refer to the following IBM manuals for detailed information:

- z/VSE Installation
- z/VSE System Control Statements
- z/VSE Guide to System Functions
- REXX/VSE User's Guide
- REXX/VSE Reference

Chapter 9. Providing Service

A product's quality depends also on the way it is serviced in the field. The service process is a method to enhance a product's quality and image. This chapter shows how you can provide service for your product using MSHP.

Service can be either corrective or preventive. Corrective service is supplied in response to a defect discovered by an user of the product. Preventive service means applying available service to a product before a defect is rediscovered by another user.

In Chapter 7, “Creating Installation Tapes,” on page 77 you saw that each product is structured into components and that each component is identified by its component ID (see “Component Identifier” on page 72) and CLC. Service is always for the component of the product, not for the product itself. Therefore, the fully-qualified component identifier is used to relate the fix to that defective component.

Note: The identifiers used for product installation can't be changed by service.

Figure 6 on page 80 shows that for MSHP a component consists of PHASES, MODULES, and MACROS. Only these kinds of members can be serviced by MSHP. The MACRO member types allocated for specific use are shown in Chapter 11, “Library Member Types,” on page 119.

Corrective Service

There are two ways to supply corrective service for VSE products

- Through an APAR fix (ZAP)
- Through a Program Temporary Fix (PTF)

APAR

At IBM, every previously unknown technical problem of a current release of a product is reported in the RETAIN system by an APAR record and uniquely identified by an **APAR number**. APAR stands for Authorized Program Analysis Report.

APAR Number: An APAR number is seven characters long. The first and second character (APAR prefix) is alphabetic; the following five characters are numeric.

For an IBM product the APAR prefix is assigned according to PDR 205 when the component(s) of this product is(are) defined to RETAIN. For independent vendor products, any characters can be chosen for the prefix. However, it is recommended that you don't use prefixes that are already assigned to IBM VSE products (AP, DY, HB, IR PL, PN, PP, PQ) or to IBM Business Partner products (SO) to avoid possible confusion for customers.

For information on how the customer can submit an APAR to IBM, refer to "Submitting an APAR" in the z/VSE Guide for Solving Problems. Please remember to set up a contact where your customers can report problems and submit the equivalent of an APAR.

APAR Fix

Code defects reported by an APAR are solved by an **APAR fix**, which is identified by the corresponding APAR number in RETAIN.

The APAR fix is a fast, temporary fix to the problem recorded by the APAR that may be used before the PTF is generally available and is also known as ZAP. Its goal is to give immediate help to a customer to continue work; the fix does not have to be the permanent solution applied to the product later on, as this will be the PTF. Incidentally, ZAP is not an acronym or an abbreviation; the word reflects the speed of the fix.

An APAR fix is available to all users who have encountered that problem. For problems or code changes affecting only one customer for which no APAR was written, a so-called **local fix** is applied.The local fix is written in the same way as the APAR fix.

For a sample of how to write such a fix, see Chapter 12, “APAR Fix (ZAP),” on page 121.

Resolving an APAR via PTF

Normally IBM makes APAR fixes generally available by incorporating them into a PTF.

A PTF is a temporary but **universal** fix resulting from a technical problem in a current release of the program. PTFs are built for all users of a product as a response to a program's error reported in the form of an APAR.

PTFs are the preferred method of service. PTFs allow extensive changes of a product without making it necessary to replace the entire product and requiring reinstallation of a product. Also, one PTF can resolve several APARs. A PTF replaces one or more programming elements: a macro, module, or phase in the component of an installed product. Note that other types of library members, such as procedures (PROC) are **not** supported.

In contrast to the APAR fix, the PTF is not a fast fix but requires changes in the source code. The PTF is temporary only in that the program fix may be designed and/or implemented differently in the next release. The fixes for all problems reported in the form of APARS will be integrated in the next release of the product.

PTF Number: PTFs are identified by a **PTF number**. A PTF number is seven characters long. The first and second character are alphabetic; the following five characters are numeric.

For an IBM product the PTF prefix is assigned according to PDR 205 when the component(s) of this product is(are) defined to RETAIN. For independent vendor products, any characters can be chosen for the prefix. However, it is recommended that you don't use prefixes that are already assigned to IBM VSE products (UD, UG, UL, UN UP, UQ, UR) or to IBM Business Partner products (UU) to avoid possible confusion for customers.

Ensuring the Correct Environment

When servicing a product, you need to ensure that the PTF/APAR is applied properly and does not damage the product. A product can be damaged when service is applied to a component on the wrong release level or when prerequisite/corequisite changes (changes that depend on each other) for other components are missing.

Since PTFs/APARs belong to a certain component, MSHP statements ensure that the PTF/APAR is applied to the correct component in the correct environment.

The MSHP statements **APPLY** in a PTF and **CORRECT** in an APAR contain the full qualified component ID. This relates the PTF/APAR to the component and thus ensures the correct target library.

The MSHP statement REQUIRES is used to ensure that the environment is correct. This statement requests that other products, components, PTFs, or APAR fixes should be present, or explicitly not present when the APAR/PTF is installed.

Note: The environment is defined by the identifiers used for product installation (component ID, CLC, and product ID). These identifiers can't be changed by service.

Using REQUIRES

The following example describes a scenario where a technical problem is discovered in an operational environment:

The product to be serviced in this scenario consists of two components, components A and B, each with three modules, as illustrated in Figure 11 on page 97.

CASE 1: Defect in module A1 and A2 of component A

After the new product is shipped, you discover that a defect in component A needs to be fixed in the modules A1 and A2 by means of a PTF.

Solution: PTF UD00001 will replace module A1 and A2 and ensures its correct target by using the appropriate APPLY and REQUIRES statements:

```
APPLY 5666-001-01-A10:UD00001
REQUIRES PRE=001A10
```

CASE 2: Defect in module A1 that requires also a change in module B1

Some time later, another defect is discovered. Again, a module must be fixed in component A, but this time a change in component B is also required.

Solution: Two PTFs, UD00002 and UD00003, are required, because two components are affected.

PTF UD00002 for component A:

The PTF requires the following for installation: because module A1 now contains the fix for the first problem, which affects also module A2, the application of PTF UD00001 is required. To ensure the application of the earlier PTF, this PTF is stated as a **prerequisite PTF**, as shown below.

Since the new change in module A1 requires the modified module B1 in component B, PTF UD00003 for component B must be applied along with PTF UD00002. This is called a **corequisite PTF**.

The MSHP statements to ensure correct application look as follows:

```
APPLY 5666-001-01-A10:UD00002
REQUIRES PRE=001A10
REQUIRES PRE=UD00001
REQUIRES 5666-001-02 CO=UD00003
```

PTF UD00003 for component B:

The fix in component B replaces module B1 and requires PTF UD00002 for component A to be present, too, so that they are applied together. The MSHP statements to ensure correct application look like this:

```
APPLY 5666-001-02-A10:UD00003
REQUIRES PRE=001A10
REQUIRES 5666-001-01 CO=UD00002
```

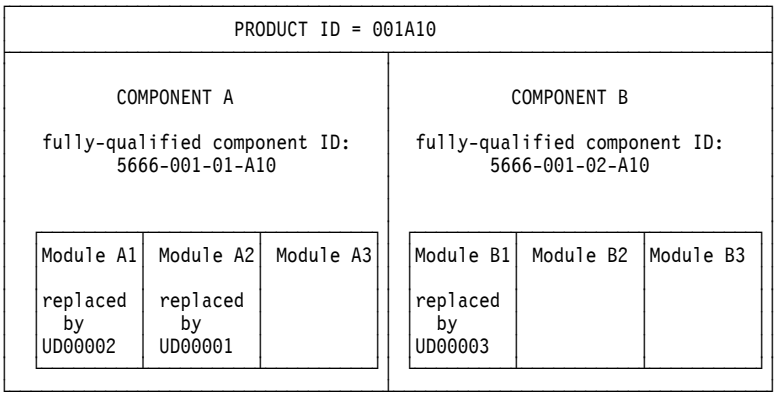


Figure 11. Example of a Serviced Product

Summary

The installation of PTFs and the resolution of prereq/coreq PTF situations are controlled by MSHP as follows:

Prerequisite:
One PTF requires the application of another as a prerequisite to its own application.

Corequisite:
Two PTFs require the application of each other. The PTFs must be installed together.

For additional sample PTFs refer to Chapter 13, “Programming Temporary Fix (PTF),” on page 123.

For detailed information on JCL and MSHP statements and their additional parameters, please refer to z/VSE System Control Statements.

Building a PTF

Using Figure 12 on page 99 as an example of a PTF, this section shows how a complete PTF can be built.

A PTF consists of three parts:

- JCL with comment cards between // JOB and // EXEC MSHP
- MSHP statements
- The data

Part 1 : **JCL with comment cards between // JOB and // EXEC MSHP**: This comment describes the problem(s) that is/are fixed by this PTF, and whatever else is necessary for successful PTF application. For a sample of a PTF with special instructions in the comment, refer to “PTF for Macros” on page 124.

Part 2 : The **MSHP statements** make up the definition of the PTF. In addition to the environment description, they define which PTFs are superseded, which library members are affected, and which link books have to be relinked.

APPLY
is the first MSHP statement in a PTF. It relates the PTF to the component and thus ensures the correct target library. All of the following MSHP statements are related Detail Control Statements.

RESOLVES
is a mandatory statement; it indicates which APARs are fixed by the PTF and may associate a comment with a PTF.

REQUIRES
is an optional statement and ensures the correct PTF environment. For more examples of REQUIRES, refer to “PTF for Synchronizing Service” on page 125 and the following pages.

SUPERSEDES
is an optional statement and identifies which PTFs are superseded by this one. For detailed information, refer to “Superseding PTF and Associated Requires-Groups” on page 126.

AFFECTS
is a mandatory statement and lists the phases, modules, and macros that are replaced by the PTF. Multiple PHASES, MODULES, and MACROS operands can be specified. If different macro types are to be serviced in one PTF, at least one MACROS operand must be specified for each macro type.

INVOLVES
is an optional statement and is needed if modules are replaced, it must be link-edited after installation. The specified value is the link-book(s).

Note: A link-book must have a member type of OBJ and must not include comments.

DATA
is a mandatory statement; it indicates the last MSHP statement in a PTF and is followed by the actual library members that will replace the defective ones.

Part 3 : **Data**: The last PTF part, data, is actually part of the MSHP DATA statement, the new library members. These members (phases, modules, and/or macros) can be listed in any order, however it is recommended to group them. MSHP starts either the linkage editor if it finds a PHASE statement or the librarian program if it finds a CATALOG statement and passes all following lines unaltered and unchecked to the called program. If this program recognizes the end of a member, MSHP gets control back and again starts checking the input lines.

The new modules, phases, or macros are prepared in a VSE library and are punched by using LIBR to build the PTF elements. When punched by LIBR, some necessary statements are supplied by the librarian: the

PHASE and/or CATALOG statements, as well as the /+ delimiter statements. They should **not** be removed from the library members. They are used for separation.

```
// JOB UD12345
*  APPLICATION COMMENT(S) :
*                           COMPONENT   :     5666-301-01-A42
*                           APARS FIXED :     DY28888
*
*  SPECIAL CONDITIONS     : NONE
*
*  COPYRIGHT :              (C) COPYRIGHT IBM CORP. 1984
*                           LICENSED MATERIAL - PROPERTY OF IBM
*
*  COMMENTS  :
*
// PAUSE EOB OR CANCEL
// EXEC MSHP
 APPLY  5666-301-01-A42 : UD12345
  RESOLVES 'short description' APARS=DY28888
  REQUIRES PRE=(302H01)
  SUPERSEDES (UD23456,UD34567)
  AFFECTS                 -
  PHASES =  (  PHAABC     -
               PHADEF  )  -
  MODULES  = ( MODGHI     -
               MODJKL  )  -
  MACROS   = ( MACMNO     -
               MACPQR  )  -
  TYPE     =   A          -
  MACROS   =   MACSTU     -
  TYPE     =   E
  INVOLVES LINK = LINKBOOK
  DATA;
 PHASE PHAABC,S+X'.......'
 ................PHASE PHAABC
 PHASE PHADEF,S+X'.......'
 ................PHASE PHADEF
 CATALOG MODGHI.OBJ    REPLACE=YES
 ................MODULE MODGHI
 CATALOG MODJKL.OBJ    REPLACE=YES
 ................MODULE MODJKL
 CATALOG MACMNO.A      REPLACE=YES
 ................MACRO  MACMNO
 CATALOG MACPQR.A      REPLACE=YES
 ................MACRO  MACPQR
 CATALOG MACPQR.E      REPLACE=YES
 ................MACRO  MACSTU
/$
/*
/&
```

Figure 12. PTF Format

Distributing a PTF

PTFs are usually shipped on a tape called **VSE service tape**. A VSE Service Tape can contain only one PTF, but can also consist of up to 9 tape volumes. It has the following layout:

Table 13. Layout of PTF Tape

File Number	Content
1	History file prepared by MSHP 'LIST SERVICETAPE XREF'
2	Service documentation
3	null file (tape mark)
4	EXCLUDE-list
5	Cover letters
6	PTFs
7	null file (tape mark)

Table 13. Layout of PTF Tape (continued)	
File Number	**Content**
8	null file (tape mark)

Description

All files that are relevant to MSHP (file 1, 2, 4, 5, and 6) must either contain MSHP information in the correct format or must be empty. File 2 has to be blocked with the block size of 7980; the logical record size has to be 133 characters (fixed format). File 4, file 5, and file 6 have to be blocked with the block size of 10320; the logical record size has to be 80 characters (fixed format).

The files used by MSHP are described below; the files not used by MSHP are present for compatibility reasons (pre-VSE/SP 2.1 format) only and may be empty.

File 1: TAPE HISTORY

This file is created as follows:

- Create tape with 5 tape marks and all PTFs on file 6.
- EXEC MSHP with LIST SERVICETAPE XREF.
- BACKUP history auxiliary to a work tape.
- Copy auxiliary history to file 1 of the final service tape.

The history on file 1 contains all MSHP information about the PTFs in file 6. It improves the performance of the PTF application process if it exists; it can, however, be empty (null file).

File 2: Service Documentation

May contain any information the customer should get together with a VSE Service Tape; it can, however, be empty (null file). Information in file 2 can be printed to SYSLST using the option Print Service Documentation of the PTF Handling dialog or the MSHP LIST function.

File 4: EXCLUDE-list

Contains any sequence of EXCLUDE control statements, indicating which PTFs, components, or products have to be automatically excluded from the service application process unless they are explicitly requested by the user via the INCLUDE command. The control statements have to be specified according to the syntax of the MSHP command EXCLUDE. Examples for FILE 4:

```
EXCLUDE PTF=(UD00001, UD00017, UD12345);
EXCLUDE PTF=(UD98765);
EXCLUDE COMPONENT=5686-066-07-15C
```

The file may be empty (null file) if nothing is to be excluded.

File 5: Cover letters

This file contains any sequence of the cover letters of the PTFs in file 6. It can be used to optimize the LIST SERVICE COVER function of MSHP, which produces a list of cover letters of all PTFs on the service tape. If this file is empty (null file), the cover letters are selected from the PTFs in file 6.

A cover letter describes the PTF. It consists of the first two parts of a PTF as described under “Building a PTF” on page 98, that is, a cover letter is a PTF without the data.

For a sample of a cover letter containing special PTF instructions, refer to “PTF for Macros” on page 124.

FILE 6: PTFs

Contains any sequence of PTF jobs built as described under “Building a PTF” on page 98.

Installing a PTF

PTF installation on VSE is done by MSHP. MSHP can be used either natively or with the support of the service dialogs provided by the VSE/SP Unique Code Interactive Interface (II). The recommended way is to use the dialogs.

VSE/SP Unique Code Dialogs

To assist the customer in using MSHP, the VSE/SP Unique Code II. provides the following dialog support for service application:

Apply PTF from Service Tape

This dialog is mainly used for PTF mass application and merges all applicable PTFs from a service tape directly into the product (sub)libraries of a running system. However, individual PTFs can be selected for installation with the INCLUDE option or excluded from installation with the EXCLUDE option.

Analyze and Apply Service Tape

This dialog maintains a list of service tapes that have been analyzed and allows to display various information about the PTFs on these tapes. The dialog provides:

- List functions based on tape, product, component, or PTF.
- Information on:
  - Affected sub-library(ies)
  - Affected members
  - Requisites
  - APARs fixed
- Select functions to choose service based on product, component, or PTF level for products that are installed.

Note: Although this dialog displays the requisites of the listed PTFs, it does not check whether all requirements are met. It only checks whether a listed PTF is already installed. Complete requisite checking is done by MSHP.

Both dialogs support **Indirect Service Application** for systemlibraries. That means, service is not applied directly to these libraries, but to additional temporary libraries. This allows to test the installed service before applying it to the system libraries. Indirect service application is either defined by the PTF's APPLY statement or may be specified by the customer using the Force Indirect option.

MSHP Processing Sequence

MSHP is able to service as many components as requested in one step and one run through the service tape(s), if the system history file correctly reflects the sub-libraries in which the components reside, and provided those sub-libraries are on-line.

Based on the history information and using the PTF's MSHP control statements, MSHP is able to determine:

- Which PTFs from a service tape have to be applied to which product in which library.
- Which requisites are needed.
- Whether service may conflict with an already applied APAR fix or local fix.

MSHP installs PTFs by replacing existing members in the VSE library with the updated members provided by PTFs.

Note: New members can be added, but existing members cannot be deleted.

The necessary steps to activate the correction in the system are described in the PTF coverletter and in the JCL comments of the apply job.

Before applying PTFs, MSHP builds a temporary history file, where the information about all requested PTFs is gathered. It uses either the tape history file (file 1), if available, or it picks up all PTF information from file 6, the PTF file. MSHP determines which PTFs are to be applied: those that are requested by the customer and those that are needed to meet the requirements of the requested ones. For the elected ones, MSHP checks the PTF requirements and protects local APAR fixes and user generated members, if both, PTF and system history information, are correct. If more than one PTF affects the same member, MSHP determines (based on the requisite relationship) which PTF contains the latest level of this member. At application time, only this member is picked up, the older levels are ignored.

PTF data has not been moved so far. A cross-reference list of all applicable PTFs and APARs is then printed and the user is asked for confirmation, before MSHP starts to pick up the affected members from the tape, to replace them directly in the user's sub-libraries and to update the history file.

Revoking PTFs and APARs

Service that is installed REVOKABLE can be removed if deemed necessary.

APAR fixes and local fixes
: are installed with a default option of REVOKABLE in the CORRECT statement. For PHASEs and MODULEs, MSHP stores all relevant information in the system history file. These APARs can be removed with the UNDO function. For source members, a job is punched to SYSPCH, which can be started to restore the original source member, thus removing all changes done by the APAR fix.

Single PTFs application (via SYSRDR/SYSIN):
: If PTFs are installed using the REVOKABLE option of the APPLY statement, backout jobs are created on tape, which can be run to restore the original members.

Mass Application of PTFs:
: If PTFs are installed from a service file using the INSTALL SERVICE command, and the REVOKABLE option is specified, a BACKOUT job is created for each component and written to a backout tape. The entire service can be revoked by executing the INSTALL BACKOUT command, should this be necessary.

  Note: Since MSHP selects only the members at the highest service level for installation, either **ALL** PTFs of a MSHP service application job can be revoked or none.

Preventive Service

There are two methods to offer preventive service to customers: as cumulative service tape or as a product refresh.

Cumulative Service Tape

All PTFs that have assembled in the course of time are merged and put on one tape, the cumulative service tape (also known as Program Update Tape). This tape is shipped to the customer.

Refresh

This method is used for VSE packages and its optional products. The product is upgraded with all available service (PTFs), tested and then sent to the distribution centers. A product refresh ensures that new customers will receive the product with most of the available service already installed and current customers can order a system refresh (free of charge) to upgrade the existing system.

VSE Refresh Installation

A VSE package refresh consists of updated base product libraries and of updated optional products. The VSE base system refresh can be installed via the **Fast Service Upgrade (FSU)**process, optional products have to be re-installed after the FSU process.

Since a FSU replaces complete libraries, a system upgrade with FSU can be much faster (depending on number of PTFs) than installing the same amount of PTFs with MSHP, which replaces single members.

More information

Refer to the following IBM manuals for detailed information:

- z/VSE System Control Statements for information on how PTFs are built.
- z/VSE Guide for Solving Problems for information on how to submit an APAR.
- z/VSE System Upgrade and Service for information on PTF handling and running a FSU.

Part 5. Packaging and Service Samples

This part provides primarily packaging and service samples. How to create installation tapes and how to service your product is described in Part 4, “Creating Installation Tapes and Servicing Your Product,” on page 69.

Chapter 10. Packaging of Products

Products are packaged in VSE/Advanced Functions Version 2 format. The following jobs are examples only, and should be adapted to the available installation and completed by adding the necessary LIBDEF statements.

Note: To shorten the examples shown, parts were extracted and replaced by periods.

Library Creation

Creation of a Library on a Sequential Disk Extent

There is a sample skeleton like the one shown in Figure 13 on page 107 in ICCF library 59 called SKLIBDEF.

```
// JOB CREATE LIBRARY         /* CREATE LIBRARY FOR PROGRAM PRODUCT  */
// OPTION PARSTD=ADD          /* OPTION PARTITION STANDARD LABEL     */
// ASSGN SYS007,140           /* ASSIGN DISK IF NECESSARY            */
// DLBL PRODLIB,'NEW.PRIVATE.LIB'       /* LABELS AND EXTENTS FOR    */
// EXTENT SYS007,VOLID5,1,0,190,114    /*PRIVATE LIBRARIES           */
// EXEC LIBR                  /* EXECUTE LIBRARIAN PROGRAM           */
   DEFINE LIB=PRODLIB         /* DEFINE THE LIBRARY 'PRODLIB' FOR    */
/*                            /* LATER INSTALLATION STEP             */
/&
```

Figure 13. Creating a Library on a Sequential Disk Extent

Definition of a Library in VSAM Managed Space

The VSE dialogs should be used to define a library in VSAM-managed space. The following job sequence can also be used:

```
// JOB DEFINE
*  DEFINE MASTER/USER CATALOG, SPACE, CLUSTER
// OPTION STDLABEL=ADD
// DLBL  IJSYSCT,'VSAM.MASTER.CATALOG',,VSAM
// EXTENT SYSCAT,SYSRES,1,0,4465,95
// DLBL DNAME,'USER.CATALOG.NO1',,VSAM
// EXTENT SYS003,DOSWK1,1,0,4465,95
// DLBL SPACE,'VSAM.DATA.SPACE',,VSAM
// EXTENT SYS004,DOSWK2,1,0,10,1900
// ASSGN SYS003,cuu
// ASSGN SYS004,cuu
/*
// EXEC IDCAMS,SIZE=AUTO
   DEFINE MASTERCATALOG               -
          (NAME(VSAM.MASTER.CATALOG)  -
          VOLUME(SYSRES)              -
          CYL(5 0))
   DEFINE USERCATALOG                 -
          (NAME(USER.CATALOG.NO1)     -
          VOLUME(DOSWK1)              -
          CYL(5  0))                  -
          CATALOG(VSAM.MASTER.CATALOG)
   DEFINE SPACE                       -
          (FILE(SPACE)                -
          CYL(100 0)                  -
          VOL(DOSWK2))                -
          CATALOG(USER.CATALOG.NO1)
   DEFINE CLUSTER                     -
          (NAME(VSE.PRODUCT.LIBRARY)  -
          NONINDEXED                  -
          SHAREOPTION(3)              -
          RECORDFORMAT(NOCIFORMAT)    -
          CYL(20 10))                 -
          CATALOG(USER.CATALOG.NO1)
/*
/&
// JOB DEFINEL
*  DEFINE LIBRARY IN VSAM SPACE
// DLBL PRODLIB,'VSE.PRODUCT.LIBRARY',,VSAM,DISP=(OLD,KEEP)
// EXEC LIBR
   DEFINE LIB=PRODLIB
/*
/&
```

Figure 14. Defining a Library in VSAM Managed Space

Creating the Header

Header Information

Product Containing "Restricted Materials" (non-OCO product)

```
HDR00101  LICENSED MATERIALS - PROPERTY OF IBM
HDR00102  THIS PRODUCT CONTAINS "RESTRICTED MATERIALS OF IBM"
HDR00103  <pgm-nr> (C) COPYRIGHT IBM CORP. 19xx, 20yy.
HDR00104  ALL RIGHTS RESERVED.
HDR00105  US GOVERNMENT USERS RESTRICTED RIGHTS -
HDR00106  USE, DUPLICATION OR DISCLOSURE RESTRICTED BY
HDR00107  GSA ADP SCHEDULE CONTRACT WITH IBM CORP.
HDR00108  SEE COPYRIGHT INSTRUCTIONS.
HDR09901  END
```

Figure 15. Header for Product Containing "Restricted Material"

Product not Containing any "Restricted Materials" (OCO product)

```
HDR00101  LICENSED MATERIALS - PROPERTY OF IBM
HDR00102  <pgm-nr> (C) COPYRIGHT IBM CORP. 19xx, 20yy.
HDR00103  ALL RIGHTS RESERVED.
HDR00104  US GOVERNMENT USERS RESTRICTED RIGHTS -
HDR00105  USE, DUPLICATION OR DISCLOSURE RESTRICTED BY
HDR00106  GSA ADP SCHEDULE CONTRACT WITH IBM CORP.
HDR09901  END
```

Figure 16. Header for Product not Containing "Restricted Material"

Note:

1. IBM developers should check Corporate Standard C-S 0-6045-002 for the latest wording of the copyright statement.
2. 19xx first year product was published.
3. 19yy last year product was published with substantial changes (5% or more changes from the original).

For an OCO Product with More than One Copyright Information

```
HDR00101 LICENSED MATERIALS - PROPERTY OF IBM
HDR00102 5686-CF7 (C) COPYRIGHT IBM CORPORATION  2004
HDR00103 ALL RIGHTS RESERVED.
HDR00104 US GOVERNMENT USERS RESTRICTED RIGHTS -
HDR00105 USE, DUPLICATION OR DISCLOSURE RESTRICTED BY
HDR00106 GSA ADP SCHEDULE CONTRACT WITH IBM CORP.
HDR00107
HDR00108 ENGLISH SYNONYM INFORMATION IS BASED ON THE AMERICAN HERITAGE
HDR00109 DICTIONARY DATA BASE - ROGET'S II, THE NEW THESAURUS - OWNED
HDR00110 BY HOUGHTON MIFFLIN COMPANY AND USED WITH PERMISSION.
HDR00111
HDR00112 (C) COPYRIGHT HOUGHTON MIFFLIN COMPANY 1982
HDR00113
HDR00114 GRADE DATA IS USED WITH PERMISSION FROM THE LIVING WORD
HDR00115 VOCABULARY.
HDR00116
HDR00117 (C) COPYRIGHT WORLD BOOK, INC. 1984
HDR00118
HDR00119 SPANISH SYNONYM INFORMATION IN BASED ON THE DICCIONARIO
HDR00120 ESPANOL DE SINONIMOS Y ANTONIMUS, 8TH EDITION (ELEVENTH RE-
HDR00121 PRINT), PUBLISHED BY AGUILAR S.A. IN MADRID, SPAIN AND USED
HDR00122 WITH PERMISSION.
HDR00123
HDR00124 (C) COPYRIGHT FEDERICO CARLOS SAINZ DE ROBLES 1984
HDR00125
HDR00126 SWEDISH SYNONYM INFORMATION IS BASED ON THE STORA
HDR00127 SYNONYMORDBOKEN, PUBLISHED BY STROMBERG'S IN STOCKHOLM,
HDR00128 SWEDEN, AND USED WITH PERMISSION.
HDR00129
HDR00130 (C) COPYRIGHT ALVA STROMBERG 1952
HDR00131
HDR09901 END
```

Figure 17. Header for an OCO Product with More than One Copyright Information

Creating or Changing VSE/Advanced Functions History Information

Creating History Information

History Information for One Component

Information using MSHP

In this sample, the extent information for the product's history file is supplied by the MSHP detailed statement DEFINE.

```
// JOB ARCH2ZZ
* ********************************************************
* ARCHIVE JOB FOR MQSeries 2.1.2                         *
* ********************************************************
// ASSGN SYS017,DISK,VOL=MQS212,SHR
// EXEC MSHP,SIZE=1024K
CREATE HISTORY SYSTEM
DEFINE HISTORY SYSTEM UNIT=SYS017 EXTENT=0705:15 -
      ID='MQSERIES 2.1.2 BASIC.HISTORY'
ARCHIVE 5686-A06-00-2ZZ              /* FULLY-QUALIFIED COMPONENT-ID */
ARCHIVE A062ZZ                       /* PRODUCT-ID                   */
COMPRISES 5686-A06-00 MACROS=(CMQ*,COPYR,MQICMD) TYPE=C
COMPRISES 5686-A06-00 MACROS=(CMQ*,MQI*) TYPE=H
COMPRISES 5686-A06-00 MACROS=(CMQ*) TYPE=P
COMPRISES 5686-A06-00 MACROS=(MQB*,MQC*,MQD*,MQJ*,MQS*,TT*) TYPE=Z
COMPRISES 5686-A06 00 MODULES=(MQB*,MQC*,MQD*,MQP*,MQS*)
COMPRISES 5686-A06-00 PHASES=(DCH*,MQB*,MQM*,MQP*,MQW*,TTM*,TTP*)
RESOLVES 'MQSERIES 2.1.2 - 5686-A06'
RESI PROD=A062ZZ PROD=PRD2.MQS212
/*
/&
```

Figure 18. Extent Information for the History File Using MSHP

Information using Job Control

In this sample, the extent information for the product's history file is supplied by JOB CONTROL statements.

```
// JOB VSAM BASE HISTORY
// DLBL IJSYSHF,'VSM.H21.HISTORY.FILE' /* DEFINE HISTORY FOR VSAM BASE */
// EXTENT SYS012,,1,0,7550,10        /* ON TRACK 7550 AND SIZE OF 10   */
// ASSGN SYS012,130                  /* ASSIGNMENT FOR THE HISTORY     */
// EXEC MSHP,SIZE=1024K
ARCHIVE 5686-CF7-05-81C
ARCHIVE CF781C
RESOLVES 'VSE/VSAM VERSION 7.1.0'
COMPRISES 5686-CF7-05 -
PHASES = ( $$$COC66 -
           $$BACLOS -
           $SVAVSAM -
           . . .    -
           IDC*     -
           IIP*     -
           IKQ*   ) -
MACROS = ( BLDVRP   -
           DLVRP    -
           ENDREQ   -
           ERASE    -
           . . .    -
           SHOWCAT  -
           TCLOSE   -
           WRTBFR ) TYPE=A ;
COMPRISES 5686-CF7-05 -
MACROS = ( HDCF781C) TYPE=Z ;
RESIDENCE PRODUCT=CF781C PRODUCTION=PRODPPS.PRVSM610 ;
/*
/&
```

Figure 19. Extent Information for the History File Using Job Control

History Information for a Feature of a Product

If you compare this sample to the job of the base product on the previous page, you will notice that the history information for a feature of a product requires only this one additional statement:

```
REQUIRES PRE=CF781C         /* PRE-REQUISITE BASIC PRODUCT */
```

```
// JOB VCM710 HISTORY FILE
// DLBL IJSYSHF,'VCM.H01.HISTORY.FILE' /* DEFINE HIST. FOR VSAM FEAT.*/
// EXTENT SYS012,,1,0,7560,10          /* ON TRACK 7560, SIZE OF 10  */
// ASSGN SYS012,130                    /* ASSIGNMENT FOR HIST.FILE   */
// EXEC MSHP,SIZE=1024K
ARCHIVE 5686-CF7-03-81G
ARCHIVE CF781G
RESOLVES 'VSE/VSAM VERSION 7.1.0 COMMON MACROS'
REQUIRES PRE=CF781C ;                  /* VSE/VSAM VERSION 7.1.0     */
COMPRISES 5686-CF7-03 -
MACROS = ( ACB      -
           EXLST    -
           . . .    -
           SHOWCB   -
           TESTCB   ) TYPE=A ;
COMPRISES 5686-CF7-03 -
MACROS = ( HDCF781G) TYPE=Z ;
RESIDENCE PRODUCT=CF781G PRODUCTION=PRODPPS.PRVCM710 ;
/*
/&
```

Figure 20. Creating History Information for a Feature of a Product

History Information for a Product Consisting of Multiple Components Installed Together

```
// JOB VSECF71 HISTORY FILE
// DLBL IJSYSHF,'VSE/AF.NEW.HIST',99/365,SD
// EXTENT SYS012,SYS380,1,0,1560,45
// ASSGN SYS012,380
// EXEC MSHP,SIZE=1024K
CREATE HIST SYSTEM
ARCHIVE 5686-CF7-01-81C ;
ARCHIVE 5686-CF7-02-81C ;
ARCHIVE 5686-CF7-03-81C ;
ARCHIVE 5686-CF7-04-81C ;
ARCHIVE 5686-CF7-05-81C ;
ARCHIVE 5686-CF7-06-81C ;
ARCHIVE 5686-CF7-07-81C ;
ARCHIVE 5686-CF7-08-81C ;
ARCHIVE 5686-CF7-09-81C ;
ARCHIVE CF781C          /* LEVEL ID FOR VSE/CF VERSION 7.1.0 */ ;
RESOLVES 'VSE CENTRAL FUNCTIONS VERSION 7.1.0' ;
COMPRISES 5686-CF7-02 -                        /* OK */
PHASES   = ( $$ABERRF  -
             $$ABERRG  -
             $$ABERRK  -
             $$ABERRL  -
             $$ABERRM  -
             $$ABERRN  -
             $$ABERRO  -
             . . .     -
             IJDANCHX  -
             IJDPR3  -
             IJH*    -
             IJJ*     )  ;
COMPRISES 5686-CF7-02 -
MODULES  = ( $$ABEREF  -
             $$ABERRG  -
             $$ABERRK  -
             . . .     -
             IJJGSD*  -
             IJJGV*   -
             IJJH*    -
             IJJT*    -
             IJJX*    -
             IJND*   ) ;
COMPRISES 5686-CF7-02 -                        /* OK */
MACROS   = ( CDMOD    -
             CHECK    -
             . . .    -
             . . .    -
             TRUNC    -
             WRITE  )     TYPE=E ;
COMPRISES 5686-CF7-02 -                        /* OK */
MACROS   = ( BOMTAC   -
             IJJT$SEC )   TYPE=A ;
```

Figure 21. History Information for a Product with Multiple Components Installed Together (Part 1 of 2)

```
COMPRISES 5686-CF7-04 -                        /* OK */
PHASES   = ( $$ABERAN -
             $$ABERRS -
             . . .    -
             $$BOOR01 ) -
MODULES  = ( $$ABERAN -
             $$ABERRS -
             . . .    -
             $$BOMR01 -
             $$BOOR01 ) -
MACROS   = ( DFR      -
             DISEN    -
             . . .    -
             RESCN    -
             SETDEV    ) TYPE=A ;COMPRISES 5686-CF7-06  -
PHASES   = ( $$$CO81C -
             $$A$*    -
             $$ABERA1 -
             . . .    -
             SAFORMEM -
             SSERV       ) ;
COMPRISES 5686-CF7-06    -                     /* OK */
MODULES  = ( $$$CO81C -
             $$A$IPL* -
             . . .    -
             VMCF$BCP -
             VMCFCP     ) ;
COMPRISES 5686-CF7-06   -
MACROS   = ( APL      -
             APPCVM   -
             . . .    -
             MSAT     -
             MVCOM     ) TYPE=A ;
COMPRISES 5686-CF7-06  -
MACROS   = ( NPGR     -
             NPGRLST  -
             . . .    -
             XPOST    -
             XWAIT     )   TYPE=E ;
COMPRISES 5686-CF7-06  -
MACROS   = ( HDCF781C  )   TYPE=Z ;
COMPRISES 5686-CF7-07 -                        /* OK */
PHASES   = ( MSHP*      -
             PTF*     ) -
MODULES  = ( IKR*     ) ;
COMPRISES 5686-CF7-08 -
PHASES   = ( BLN*     -
             BLX*     -
             INFO*    ) -
MODULES  = ( BLN*     -
             IJBXA*   -
             BLX*     ) -
MACROS   = ( BLN*    )   TYPE=T ;
COMPRISES 5686-CF7-08 -
MACROS   = ( BLN*    )   TYPE=M ;
COMPRISES 5686-CF7-08 -
MACROS   = ( BLN*    )   TYPE=N ;
RESIDENCE PRODUCT=CF781C PRODUCTION=IJSYSR1.SYSLIB -
                         GENERATION=GENLIB1.G1$007 ;
/*
/&
```

Figure 21. History Information for a Product with Multiple Components Installed Together (Part 2 of 2)

History Information for a Product Consisting of Multiple Components Installed Selectively

```
// JOB DEFHIST
* ********************************************************************
* DEFINE HISTORY FOR QMF/VSE 7.2.0 LANGUAGES                         *
* ********************************************************************
// DLBL QMF720,'QMF.VSE.LIBRARY.R720'
// EXTENT ,QMF72A
// EXTENT ,QMF72B
// ASSGN SYS021,DISK,VOL=QMF72T,SHR
// EXEC MSHP,SIZE=1024K
 /*    DEFINE HISTORY FOR QMF FRENCH                                 */
  CREATE HISTORY SYSTEM
  DEFINE HISTORY SYSTEM UNIT=SYS021 EXTENT=0935:15 -
        ID='QMF/VSE 7.2.0 FRENCH.HISTORY'
  ARCHIVE 5648-061-07-2NU            /* FULLY-QUALIFIED COMPONENT-ID */
  ARCHIVE 0612NU                     /* PRODUCT-IDENTIFIER           */
    RESOLVES 'MQF/VSE 7.2.0 FRENCH - 5648-061'
    COMPRISES 5648-061-07 -
         PHASES=(DSQ*,DXE*)                    -
         MODULES=(DSQ*)                        -
         MACROS=(DSQ*,DXE*,DXY*) TYPE=A
    COMPRISES 5648-061-07                      -
         MACROS=(DSQ*,DXE*,HD*) TYPE=Z
    REQUIRES PRE=0612NR              /* PRE-REQUISITE BASIC PRODUCT  */
  RESIDENCE PRODUCT=0612NU PRODUCTION=QMF720.PR$2NU
 /*    DEFINE HISTORY FOR QMF FRENCH                                 */
  CREATE HISTORY SYSTEM
  DEFINE HISTORY SYSTEM UNIT=SYS021 EXTENT=0950:15 -
       ID='QMF/VSE 7.2.0 JAPANESE.HISTORY'
  ARCHIVE 5648-061-10-2NX            /* FULLY-QUALIFIED COMPONENT-ID */
  ARCHIVE 0612NX                     /* PRODUCT-IDENTIFIER           */
    RESOLVES 'QMF/VSE 7.2.0 JAPANESE - 5648-061'
    COMPRISES 5648-061-10 -
         PHASES=(DSQ*,DXE*)                    -
         MODULES=(DSQ*)                        -
         MACROS=(DSQ*,DXE*,DXY*) TYPE=A
    COMPRISES 5648-061-10                      -
         MACROS=(DSQ*,DXE*,HD*) TYPE=Z
    REQUIRES PRE=0612NR              /* PRE-REQUISITE BASIC PRODUCT  */
  RESIDENCE PRODUCT=0612NX PRODUCTION=QMF720.PR$2NX

/*
/&
```

Figure 22. History Information for a Product Consisting of Multiple Components Installed Selectively

Adding, Changing and Restoring History Information

Adding Information to an Existing History File

This job removes the default product ID generated by MSHP during the installation of the product on the z/VSE system. The product ID is then re-archived to permit the addition of the new RESOLVES statement that contains the 16 character tapefile ID. The sublibrary in the RESIDENCE statement should use the name of the sublibrary that contains the product.

```
* $$ JOB JNM=NEWHIST,DISP=D,CLASS=0
// JOB NEWHIST  CORRECT THE HISTORY FILE
// DLBL IJSYSHF,'history.filename',99/365,SD
// EXTENT SYSxxx,vvvvvv,1,0,sss,nnnn
// ASSGN SYSxxx,DISK,VOL=vvvvvv,SHR
// EXEC MSHP,SIZE=1024K
  REMOVE    prod-id
  ARCHIVE   prod-id
  RESOLVES 'tape.file.id ord.number product release'
  COMPRISES    component ID        -
    PHASES  = (generic names,...)  -
    MODULES = (generic names,...)  -
    MACROS  = (generic names,...) TYPE=A
  RESIDENCE PRODUCT=prod-id PRODUCTION=lib.sublib
/*
/&
* $$ EOJ
```

Figure 23. Adding Information to an Existing History File

Removing Product and Component Identifiers

When removing product and component identifiers, you can either include both REMOVE statements in one job, or submit two separate jobs as shown below.

```
// JOB REMOVE PRODID
// EXEC MSHP,SIZE=1024K
REMOVE 09916O
/*
/&
// JOB REMOVE COMP
// EXEC MSHP,SIZE=1024K
REMOVE 5648-099-01-16O
/*
/&
```

Figure 24. Removing Product and Component Identifiers

Changing Entries in an Existing Product History

This job first archives new product information into a new defined history file. With the MERGE step those parts of the product definition that are not defined are taken over from the old product history.

```
// JOB UPDATE HISTORY          /* UPDATE HISTORY FOR PROGRAM PRODUCT */
// DLBL IJSYSHF,'NEW.2NR.HISTORY.FILE'  /* DEFINE NEW HISTORY FILE   */
// EXTENT SYS013,,1,0,7750,10  /* ON TRACK 7550 and SIZE OF 10       */
// ASSGN SYS012,130            /* ASSIGMENT FOR THE AUX HISTORY      */
// ASSGN SYS013,130            /* ASSIGMENT FOR THE NEW HISTORY      */
// EXEC MSHP,SIZE=1024K
  CREATE HISTORY SYSTEM        /* CONTROL STATEMENT FOR CREATION     */
  ARCHIVE 5648-061-07-2NU      /* COMPONENT ID AND RELEASE-NO        */
  ARCHIVE 0612NU               /* NEW MSHP PRODUCT IDENTIFIER        */
  RESOLVES 'QMF.VSE 7.2.0 FRENCH' /* COMMENT FOR RETRACE PRODUCT     */
  REQUIRES PERE=(0612NR)       /* UPDATE OF PREREQUISITES            */
  COMPRISES 5648-061-07      - /* COMPONENT THAT IS COMPRISED        */
  PHASES = (DSQ*             - /* DEFINITION OF THE PHASES, MODULES, */
            DXE*)            - /* MACROS CONTAINED IN THIS PROGRAM   */
  MODULES = (DSQ*)           - /* PRODUCT.                           */
  MACROS = (QSQ*             -
            DXE*             -
            DXY*) TYPE=A
  COMPRISES 5648-061-07      -
  MACROS = (DSQ*             -
            DXE*             -
            DXY*) TYPE=Z
  MERGE HISTORX              - /* MERGE OLD SYSTEM ENTRIES TO THE NEW*/
  AUXILIARY SYSTEM             /* HISTORY WITH THE UPDATED ENTRIES.  */
  DEFINE HISTORY AUXILIARY   - /* DETAIL STATEMENT FOR 'OLD' HISTORY */
  EXTENT=7220:45             - /* ON TRACK 7720 AND A SIZE OF        */
  ID='2NU.PRD.HISTORY.FILE'  - /* 45 TRACKS. PROVIDE AN IDENTIFIER   */
  UNIT=SYS012                - /* AND WHERE THE HISTORA RESIDES      */
/*
/&
```

Figure 25. Changing Entries in an Existing Product History

Restoring the History File

```
// JOB RESTORE HISTORY FILE       /* JOB TO RESTORE MSHP HISTORY         */
// ASSGN SYS006,280               /* ASSIGNMENT FOR TAPE UNIT 280        */
// MTC REW,SYS006                 /* REWIND TAPE                         */
// MTC FSF,SYS006,2               /* TAPE POSITIONING AT HISTORY FILE    */
// EXEC MSHP,SIZE=1024K
RESTORE HISTORY SYSTEM            /* MSHP FUNCTION STATEMENT             */
 DEFINE HISTORY SYSTEM         -  /* DETAIL STATEMENT FOR SYSTEM HISTORY */
  EXTENT=7550:10               -  /* ON TRACK 7550 AND A LENGTH OF       */
  ID='SYSTEM.HISTORY.FILE'     -  /* 10 TRACKS . PROVIDE AN IDENTIFIER   */
  UNIT=SYS012                    /* AND WHERE THE HISTORY SHOULD BE     */
/*                               /* RESTORED.                           */
// MTC REW,SYS006                 /* REWIND TAPE
/&
```

Figure 26. Restoring the History File

Backup of a Product or Feature

Back up the Production and Generation Part of a Product

General Format:

```
* $$ JOB  JNM=BCKNEW,CLASS=0,DISP=D
// JOB BCKNEW   BACKUP PRODUCT IN NEW FORMAT
// DLBL lib,'product.library.name',99/365
// EXTENT ,vvvvvv,1,0,sss,nnnn
// DLBL IJSYSHF,'history.file.name',99/365,SD
// EXTENT SYSxxx,vvvvvv,1,0,sss,nnnn
// ASSGN SYSxxx,DISK,VOL=vvvvvv,SHR
// ASSGN SYS006,cuu               /* of the tape unit               */
// MTC REW,SYS006
// MTC WTM,SYS006,2               /* Optional. To ensure that new   */
// MTC REW,SYS006                 /* tapes are initialized.         */
// EXEC MSHP,SIZE=1024K
 BACKUP PROD=(prod-id) ID='tapefile-id' HEADER=prod-id PROD GENE
/*
// MTC REW,SYS006
/&
* $$ EOJ
```

Figure 27. Backing Up a Product or Feature

The distribution tape created through this backup operation now has the format described in Table 7 on page 82.

Back up the Production Part of a Product or Feature

```
// JOB BACKUP DITTO/ESA 1.3.0 FOR VSE
// PAUSE TAPE ON 280 MOUNTED?         ---> PRESS ENTER, IF MOUNTED.
// ASSGN SYS006,280
// MTC REW,SYS006
// EXEC MSHP,SIZE=1024K
BACKUP PRODUCT=099360 ID='DITTO/ESA..1.3.0' HEADER=HD099360 PROD
/*
// MTC REW,SYS006
/*
/&
```

Figure 28. Backing Up the Production Part of a Product

Back up a Product or Feature for Selective Installation

```
// JOB BACKUP QMF
// PAUSE TAPE ON 570 MOUNTED?          ---> PRESS ENTER, IF MOUNTED.
// ASSGN SYS021,DISK,VOL=QMF72A,SHR    /* QMF/VSE HISTORY FILE     */
// ASSGN SYS006,570,D0                 /* SYS006 DISTRIBUTION TAPE */
// MTC REW,SYS006
// EXEC MSHP,SIZE=1024K
   BACKUP PRODUCT=0612NR             - /* QMF/VSE BASE / US ENGLISH */
          ID='QMF/VSE....7.2.0'      -
          HEADER=HD0612NR            -
          PRODUCTION
   BACKUP PRODUCT=0612NU             - /* QMF/VSE FRENCH            */
          ID='QMF/VSE.F..7.2.0'      -
          HEADER=HD0612NU            -
          PRODUCTION
   BACKUP PRODUCT=0612NV             - /* QMF/VSE GERMAN            */
          ID='QMF/VSE.G..7.2.0'      -
          HEADER=HD0612NV            -
          PRODUCTION
   BACKUP PRODUCT=0612NX             - /* QMF/VSE JAPANESE          */
          ID='QMF/VSE.K..7.2.0'      -
          HEADER=HD0612NX            -
          PRODUCTION
/*
// MTC RUN,SYS006
/*
/&
```

Figure 29. Backing Up a Product or Feature for Selective Installation

Installing a Product or Feature

Installing a Product with a Production Part

```
* $$ JOB JNM=INSNEW,CLASS=0,DISP=D
// JOB INSNEW  INSTALL A NEW FORMATTED TAPE
// DLBL lib,'product.library.name',99/365
// EXTENT ,vvvvvv,1,0,sss,nnnn
// DLBL IJSYSHF,'history.file.name',99/365,SD
// EXTENT SYSxxx,vvvvvv,1,0,sss,nnnn
// ASSGN SYSxxx,DISK,VOL=vvvvvv,SHR
// ASSGN SYS006,cuu                          /* CUU OF TAPE UNIT */
// MTC REW,SYS006
// EXEC MSHP,SIZE=1024K
 INSTALL PRODUCT FROMTAPE -
ID='tapefile-id' PROD INTO=lib.sublib
/*
/&
* $$ EOJ
```

Figure 30. Installing a Product with a Production Part

Installing a Product with a Production and Generation Part

```
// JOB INSTALL PROGRAM PRODUCT    /* INSTALL PROGRAM PRODUCT            */
// ASSGN SYS006,280               /* ASSIGNMENT FOR TAPE UNIT           */
// MTC REW,SYS006                 /* POSITIONING OF THE TAPE            */
// EXEC MSHP,SIZE=1024K
INSTALL PRODUCT FROMTAPE       -  /* CONTROL STATEMENT FOR MSHP         */
  ID = 'prodname...V.R.M'      -  /* SPECIFY IDENTIFIER FOR MSHP        */
  PRODUCTION INTO=prodlib      -  /* SPECIFY PRODUCTION LIBRARY         */
  GENERATION INTO=genlib          /* SPECIFY GENERATION LIBRARY         */
/*
// MTC REW,SYS006                 /* REWIND DISTRIBUTION TAPE           */
/&
```

Figure 31. Installing a Product with a Production and Generation Part

Installing a Product with Selected Parts

The first INSTALL statement installs the required base product; the later step(s) install the selected part(s). Note that the base product is installed before the part requiring the base product. Also, the sequence corresponds to the sequence as backed up to tape.

```
// JOB INSTALL QMF/VSE 7.2.0      /* INSTALL QMF/VSE BASE AND FRENCH */
// PAUSE TAPE ON 280 MOUNTED?     ---> PRESS ENTER, IF MOUNTED.
// ASSGN SYS006,28                /* ASSIGNMENT FOR TAPE UNIT        */
// MTC REW,SYS006                 /* POSITIONING OF TAPE             */
// EXEC MSHP,SIZE=1024K
INSTALL PRODUCT FROMTAPE       -  /* CONTROL STATEMENT FOR MSHP      */
  ID='QMF/VSE....7.2.0'        -  /* TAPE FILE ID OF BASE PRODUCT    */
  PRODUCTION INTO=PRD2.QMF720     /* SPECIFY PRODUCTION LIBRARY      */
INSTALL PRODUCT FROMTAPE       -  /* CONTROL STATEMENT FOR MSHP      */
  ID='QMF/VSE.F..7.2.0'        -  /* TAPE FILE ID OF SELECTED LANG.  */
  PRODUCTION INTO=PRD2.QMF720     /* SPECIFY PRODUCTION LIBRARY      */
COMPATIBLE WITH=(0612NR)
/*
// MTC REW,SYS006                 /* REWIND DISTRIBUTION TAPE        */
/*
/&
```

Figure 32. Installing a Product with Selected Parts

Installing a Product from a Stacked Tape

```
// JOB INSTALL FROM STACKED TAPE
* INSTALL QMF/VSE 7.2.0 BASE / US ENGLISH, INSTALL
* FRENCH, GERMAN AND JAPANESE LANGUAGE SUPPORT FROM A Z/VSE OPTIONAL
* PRODUCT TAPE INTO DIFFERENT LIBRARIES
// PAUSE STACKED TAPE 280 MOUNTED?     --> PRESS ENTER, IF MOUNTED.
// ASSGN SYS006,280               /* ASSIGNMENT FOR TAPE UNIT        */
// MTC REW,SYS006                 /* POSITIONING OF TAPE             */
// EXEC MSHP,SIZE=1024K,PARM='PIDSTACKED'
INSTALL PRODUCT FROMTAPE        - /* CONTROL STATEMENT FOR MSHP      */
  ID='QMF/VSE....7.2.0'         - /* TAPE FILE ID OF BASE PRODUCT    */
  PRODUCTION INTO=PRD2.QMF720     /* SPECIFY PRODUCTION LIBRARY      */
INSTALL PRODUCT FROMTAPE        - /* CONTROL STATEMENT FOR MSHP      */
  ID='QMF/VSE.F..7.2.0'         - /* TAPE FILE ID OF FRENCH LANGUAGE */
  PRODUCTION INTO=PRD2.QMF720F    /* SPECIFY PRODUCTION LIBRARY      */
COMPATIBLE WITH=(0662NR)          /* BASE PRODUCT DEPENDENCY         */
INSTALL PRODUCT FROMTAPE        - /* CONTROL STATEMENT FOR MSHP      */
  ID='QMF/VSE.G..7.2.0'         - /* TAPE FILE ID OF GERMAN LANGUAGE */
  PRODUCTION INTO=PRD2.QMF720G    /* SPECIFY PRODUCTION LIBRARY      */
COMPATIBLE WITH=(0662NR)          /* BASE PRODUCT DEPENDENCY         */
INSTALL PRODUCT FROMTAPE        - /* CONTROL STATEMENT FOR MSHP      */
  ID='QMF/VSE.G..7.2.0'         - /* TAPE FILE ID OF JAPANSE LANGUAGE*/
  PRODUCTION INTO=PRD2.QMF720K    /* SPECIFY PRODUCTION LIBRARY      */
COMPATIBLE WITH=(0662NR)          /* BASE PRODUCT DEPENDENCY         */
/*
// MTC RUN,SYS006                 /* REWIND AND UNLOAD STACKED TAPE  */
/*
/&
```

Figure 33. Installing from a Stacked Tape

Chapter 11. Library Member Types

Library members with a type other than OBJ or PHASE are serviced by MSHP as macros only if a one-character type or PROC or HTML is used. The following list shows the member types allocated for specific use. If product-related data is to be shipped in the product's library, a member type must be chosen that does not conflict with any listed here.

A -
Assembler copy books

B -
VTAM® source books

C -
COBOL copy books or C/370 source programs

D -
Document Composition Facility image libraries for DCF/DLF VSE NCP Assembler copy books

E -
Edited macros (This member type cannot be changed by an APAR fix if you use the new High Level Assembler for VSE. It is recommended not to use this member type, use A-books instead.) Also refer to step “3” on page 78.

F -
NCP assembler macros edited

G -
ATMS conversion macros for DCF/DLF VSE

H -
GML-tags for DCF/DLF VSE or C/370 standard header files

I -
ICCF library (DTSFILE) members [1]

M -
SPF and other dialog message members

N -
SPF and other dialog panel members

P -
PL/1 copy books

R -
RPG copy books

S -
SPF and other dialog skeleton members

T -
SPF and other dialog table members

U -
Unattended node support members

V -
Text repository file (VSE/SP Unique Code only)

W -
PC-code for downloading

[1] The product-related data must be shipped in the format required for the appropriate sublibrary, that is, data shipped in the I-sublibrary must be of type ICCF DTSFILE member and contain the necessary DTSUTIL control statements (ADD MEMBER, PURGE MEMBER, AND END OF MEMBER control statements).

Y -
Information books

Z -
Sample programs, installation books

HTML -
Hyper Type Markup Language (Web)

PROC -
VSE Procedures

Chapter 12. APAR Fix (ZAP)

```
// JOB MSHPZAP
// EXEC MSHP,SIZE=1024K
 CORRECT 5686-010-01-A12:PL54321
 REQUIRES PRE=UD12345
 RESOLVES 'HARDWAIT AT INITIALIZE'
 AFFECTS PHASE=EGQMAIN
 ALTER 468 58E0E004 : 41E00FFF
/*
/&
```

Figure 34. APAR Fix (ZAP) for a Phase

In the following sample a module is corrected, then the linkage editor called to relink the module(s). This results in a corrected phase. Please note that in addition to the JCL required for a ZAP for a phase, also a work file must be assigned to SYS004.

```
// JOB MSHPZAP
// EXEC MSHP,SIZE=1024K
 CORRECT 5686-010-01-A12:PL54321
 RESOLVES 'HARDWAIT AT INITIALIZE'
 AFFECTS MODULE=EGQMAIN
 ALTER 468 58E0E004 : 41E00FFF
 INVOLVES  LINK=EGQLNK
/*
/&
```

Figure 35. APAR Fix (ZAP) for a Module

For further examples, see z/VSE System Upgrade and Service.

The next sample ZAPs a macro. Please note that in addition to the JCL required for a simple ZAP for a phase, work files must be assigned to SYS002, SYS003, SYS004.

```
// JOB MSHPZAP
// EXEC MSHP,SIZE=1024K
 CORRECT 5688-143-00-CD1:HB55555
 RESOLVES 'FIX TEXT'
 AFFECTS MACRO=FIJxxxx TYPE=C
 REPLACE : 041910
 A55555     MOVE WS-DOCNO           TO NUMB-FIELD IN SIA2.    041910
/$
 REPLACE : 047010
 A55555     MOVE WS-DOCNO           TO NUMB-FIELD IN SIA2.    047010
/$
/*
/&
```

Figure 36. APAR Fix (ZAP) for a Macro

All samples are REVOKABLE ZAPs, the default parameter on the CORRECT statement. This means the ZAP can be removed using the UNDO statement of MSHP. For more information refer to “Revoking PTFs and APARs” on page 102.

If a ZAP requires additional space, phases and modules can be expanded. However, this expansion remains even if the ZAP is revoked later.

```
// JOB  ZAPPUB2
// EXEC  MSHP
   CORRECT 1234-098-01-VB1 : BI12345 REVOKABLE
   RESOLVES 'MORE THAN 254 I/O DEVICES'
   AFFECTS  PHASE=BMM1 EXPAND=100
*  the EXPAND value is decimal
   ALTER  004080 00000000 : 41E00FFF
   ALTER  004084  . . .   :   . . .
*  assuming 004080 is right at the end of old module or phase
/*
/&
```

Figure 37. APAR Fix (ZAP) Expanding a Phase

Chapter 13. Programming Temporary Fix (PTF)

PTF for Phases

```
// JOB UG00207
*  PROBLEM DESCRIPTIONS:
*    GB00163 - INCORRECT DATA WHEN RUNNING ON
*              SYSTEM EQUIPPED WITH PR/SM FEATURE
*    GB00166 - 3380-K HANDLED AS IBM 3380-E
*    GB00167 - SUPPORT FOR IBM 0671 DASD
*
*  COMPONENT: 5796-PLQ-00-230
*
*  APARS FIXED: GB00163, GB00166, GB00167
*
*  SPECIAL CONDITIONS:
*    COPYRIGHT; (C) COPYRIGHT IBM CORP. 1990
*      LICENSED MATERIAL - PROPERTY OF IBM
*    ENHANCEMENT; VSE/PT SUPPORTS NOW VSE SYSTEMS RUNNING IN AN LPAR
*      ON A MACHINE EQUIPPED WITH THE PR/SM FEATURE
*    ENHANCEMENT; VSE/PT SUPPORTS DASD 0671-MOD4,0671-MOD8
*
*  COMMENTS:
*    NONE;
*
*
// PAUSE EOB OR CANCEL
// EXEC MSHP,SIZE=1024K
 APPLY  5796-PLQ-00-230:UG00207;
  REQUIRES PRE=PLQ230;
  RESOLVES 'PR/SM,3380-K,0671' APARS=(GB00163,GB00166,GB00167);
  AFFECTS                  -
  PHASES =  (  VSEPTSP      -
               VSEPTDA )    -
               VSEPTSA );
  DATA;
 PHASE VSEPTSP,S+X'.......'
 ................PHASE VSEPTSP
 PHASE VSEPTDA,S+X'.......'
 ................PHASE VSEPTDA
 PHASE VSEPTSA,S+X'.......'
 ................PHASE VSEPTSA
/$
/*
/&
```

Figure 38. PTF for Phases

PTF for Modules

```
// JOB UL52789
// OPTION CATAL
*  COMPONENT: 5666-338-01-D75
*  APARS FIXED: PL43691
*  SPECIAL CONDITIONS:
*    COPYRIGHT:            (C) COPYRIGHT IBM CORP.1988
*              LICENSED MATERIAL - PROPERTY OF IBM
*  COMMENTS:
*    CROSS REFERENCE-MODULE/MACRO NAMES TO APARS
*     DDDFO194  PL43691
*
*    CROSS REFERENCE-APARS TO MODULE/MACRO NAMES
*     PL43691   DDDFO194
*
*    THE FOLLOWING MODULES AND/OR MACROS ARE AFFECTED BY THIS PTF:
*
*    MODULES
*     DDDFO194
*
*    LISTEND
// PAUSE EOB OR CANCEL
// EXEC MSHP,SIZE=1024K
APPLY 5666-338-01-D75:UL52789;
REQUIRES PRE=338D75;
REQUIRES PRE=UL47064;
RESOLVES APARS=PL43691;
AFFECTS MODULES=DDDFO194;
INVOLVES LINK=(DDDLEDIT,DDDLSTOR);
DATA;
 ........DDDFO194.OBJ
/$
/*
/&
```

Figure 39. PTF for Modules

PTF for Macros

MSHP recognizes only three types of library members: modules (OBJ), phases (PHASE), and macros (one character extension or PROC or HTML, refer to Chapter 11, “Library Member Types,” on page 119). The following example shows how DisplayWrite/370 CLISTs are serviced as macros. It also shows that the cover letter or comment cards in the PTF may contain instructions that must be read and followed before the fix can be active.

CLISTs of DisplayWrite/370 are shipped as members of a VSE library. When customizing the product, a VSAM file is defined and loaded with the CLISTs from where they are used by DisplayWrite/370. CLISTs can also be updated by a PTF, but this requires a special job to be run after PTF application for updating the VSAM file for the fix to be effective.

```
// JOB UL93576
// OPTION CATAL
*  COMPONENT: 5686-022-34-A43
*  APARS FIXED: PL78703
*  SPECIAL CONDITIONS:
*    COPYRIGHT:            (C) COPYRIGHT IBM CORP.1990
*               LICENSED MATERIAL - PROPERTY OF IBM
*    ACTION:
*      AFTER APPLYING THIS PTF THE FOLLOWING ACTIONS MUST BE TAKEN:
*      1. TRANSFER CLIST DOCUMENT 'DKLARAB' INTO THE DISPLAYWRITE/370
*         VSAM CLUSTER 'DDD210.DDDMAST'.
*         FOR THIS PURPOSE USE THE MODIFIED JOB 'DDDJGLUE.Z' SUPPLIED
*         WITH DW/370 V2.1.0  AND  SPECIFY THE CLIST DOCUMENT NAME IN
*         THE PARAMETER FIELD OF THE EXEC STATEMENT.
*           //   EXEC PGM=DDDDGLUE,SIZE=512K,PARM='DKLARAB'
*      2. IF YOU WORK WITH COMPILED VERSIONS OF THE CLIST DOCUMENTS,
*         REFER TO CHAPTER 5, 'ACTIVATING A COMPILED CLIST DOCUMENT'
*         IN THE DISPLAYWRITE/370 INSTALLATION AND ADMINISTRATION
*         GUIDE, PERFORM STEP 3, 4 AND 5 TO COMPILE AND LOAD THE
*         NEW COPY OF DKLARAB INTO THE DDDCLIX MODULE.
*  COMMENTS:
*    CROSS REFERENCE-MODULE/MACRO NAMES TO APARS
*     DKLARAB   PL78703
*    CROSS REFERENCE-APARS TO MODULE/MACRO NAMES
*     PL78703   DKLARAB
*    THE FOLLOWING MODULES AND/OR MACROS ARE AFFECTED BY THIS PTF:
*    MACROS
*     DKLARAB
*    LISTEND
// PAUSE EOB OR CANCEL
// EXEC MSHP,SIZE=1024K
APPLY 5686-022-34-A43:UL93576 ;
REQUIRES PRE=(022A10,022A43);
SUPERSEDES (UL87283);
RESOLVES APARS=(PL75044,PL78703);
AFFECTS MACROS=(DKLARAB) TYPE=X;
AFFECTS MACROS=(IESVTABC) TYPE=PROC;
AFFECTS MACROS=(IESxxxxx) TYPE=HTML;
DATA;
 ........DKLARAB.X
 ........IESVTABC.PROC
 ........IESxxxxx.HTML
/$
/*
/&
```

Figure 40. PTF for Macros

PTF for Synchronizing Service

A PTF for a base product may require a fix in one or more of its features at the same time, so that all products are at the same level. This is achieved by corequisite PTFs.

General description

A PTF for the supervisor of VSE Central Functions requires synchronization. While the compiled supervisors are contained in the VSE Central Functions production system, the supervisor macros (used for compilation) are kept in the VSE Central Functions generation feature, which is a separate product. A PTF replacing a supervisor in the VSE Central Functions production part must, therefore, make sure that the appropriate macros in the generation part are also replaced. The generation feature need, however, not be installed since it is a separate, optional product.

Solution

Using VSE Central Functions 7.1, 5686-CF7, as an example, this is how PTFs are synchronized:

The supervisor part is component 6 of VSE Central Functions. Thus, the applicable component identifier is 5686-CF7-06. The CLC for the production system is 81C; the CLC for the generation feature is 15J. The product ID for the production system is CF781C, and for the generation feature CF781J. The fully-qualified component ID for the defective component is 5686-CF7-06-81C in the production system and 5686-CF7-06-81J in the generation feature.

Two PTFs are needed: one called UD12345 for component 5686-CF7-06-81C of the base product; the other PTF UD54321 for the component 5686-CF7-06-81J of the feature.

The PTF for the feature applies to one environment only and is described by the REQUIRES group with these conditions:

```
PRE= CF781J     the product it fixes must be present
PRE= CF781C     the feature's base product must be present
CO = UD12345    the corresponding PTF for the base must be applied
                together with it.
```

The REQUIRES groups of the PTF for the base product must describe two different environments, one with, one without the feature.

```
PRE= CF781C     the product it fixes must be present
PRE= CF/81J     the feature must be present
CO = UD54321    the corresponding PTF for the feature must be
                applied together with it, it is a corequisite PTF.
```

or

```
PRE= CF781C     the product it fixes must be present
NOT= CF781J     the feature must not be present, so no corequisite
                PTF is required.
```

The complete REQUIRES groups for both PTFs:

```
in PTF UD12345                      in PTF UD54321

APPLY 5686-CF7-06-81C : UD12345     APPLY 5686-CF7-06-81J : UD54321
REQUIRES PRE = CF781C               REQUIRES PRE = CF781J
REQUIRES PRE = CF781J               REQUIRES PRE = CF781C
REQUIRES CO  = UD54321              REQUIRES CO  = UD12345
OR
REQUIRES PRE = 81C
REQUIRES NOT = 81J
RESOLVES APAR = XX11111             RESOLVES APAR = XX11111
```

Superseding PTF and Associated Requires-Groups

This example shows how the REQUIRES groups for a PTF have to be built if a PTF *supersedes* another PTF.

This scenario deals with a product 5660-012, on release level G40. Its product ID is 012G40. It consists of one component only; the fully qualified component ID is 5660-012-01-G40. It contains the macro BTMOD and several modules M1 to M9.

Now, macro BTMOD needs a fix, to be delivered by PTF numbered UD44444. It is not the first PTF built for the product.

PTF UD11111 replaced modules M1, M7, and M9.
PTF UD22222 replaced modules M6 and M9, and macro BTMOD.
PTF UD33333 replaced macro BTMOD only.
PTF UD44444 replaces again BTMOD only.

Clearly, PTF UD44444 makes PTF UD33333 superfluous, in MSHP terms, it *supersedes* PTF UD33333. But how are the preceding PTFs influencing the last PTF, UD44444?

When PTF UD33333, the superseded one, was shipped it had integrated in BTMOD a fix delivered by its predecessor PTF UD22222. This PTF, in its turn, had not only fixed BTMOD, but also the modules M6 and M9. Module M9 was fixed before by PTF UD11111, together with module M1 and M7. This means, all the fixed modules must be available together with BTMOD, because the code in the new macro BTMOD requires it. This is again ensured by constructing the correct REQUIRES group for UD44444. To do this we look at the REQUIRES groups of its predecessors.

UD11111
REQUIRES PRE=012G40

UD22222
REQUIRES PRE=012G40 REQUIRES PRE=UD11111

UD33333
REQUIRES PRE=012G40 REQUIRES PRE=UD22222

UD44444
REQUIRES PRE=012G40 REQUIRES PRE=UD22222 SUPERSEDES (UD33333)

Of course, it is easy to construct much more complicated REQUIRES groups if more than one component and/or product have to be synchronized, because of a more complex component structure with features on top of the product. This easier example is sufficient to show the rule:

The *superseding* PTF picks up the REQUIRES group(s) of its predecessor in addition to its own - except for pre-reqs already covered. Here: UD11111 is not repeated since it is REQUIREd by UD22222.

REQUIRES-Groups if Several Products Affected

This example shows how the REQUIRES groups for PTFs have to be built if one module is contained in different products. This will keep you from ever implementing such a construction.

The scenario deals with four products, one of them a base product, the other three features on top of this base product. Each of the products contain among other modules MODA, the base product contains in addition also a module called MODB.

An explanation of such a construction could be that module MODA includes more or different functions if included in one of the features, whereas the module with the same name in the base is a stub only. A description of the four products and their relation in MSHP terms is given below.

Base product
is identified by the fully qualified component ID=5660-012-01-G40 and product ID=012G40. It contains among others the modules MODA and MODB. Its installation does not require anything special.

Feature 1
is identified by the fully qualified component ID=5660-012-02-G50 and product ID=012G50. It contains among others the module MODA also contained in the base product. The feature requires the base product, but is mutually exclusive with the second feature (012G60). Coded in its history information is REQUIRES PRE=012G40 REQUIRES NOT=012G60

Feature 2
is identified by the fully qualified component ID=5660-012-03-G60 and product ID=012G60. It contains among others the module MODA. The feature requires the base product, but is mutually exclusive with the first feature (012G50). Coded in its history information is REQUIRES PRE=012G40 REQUIRES NOT=012G50

Feature 3
is identified by the fully qualified component ID=5660-012-03-G70 and product ID=012G70. It contains among others the module MODA. The feature requires the base product, is mutually exclusive with the first feature (012G50), and replaces feature 2 (012G60). Coded in its history information is REQUIRES PRE=012G40 REQUIRES NOT=012G50

The replacement of feature 2 is achieved by having the same component ID with different CLC. When installing this feature 3 on top of feature 2, MSHP recognizes this, and issues the message:

G70 supersedes G60. Enter KEEP or DELETE.

If the answer is DELETE, the information for feature 2 is overwritten with the information for feature 3.

Now, this ubiquitous module MODA needs a fix, to be delivered by PTF. In addition, module MODB, contained in the base product only, also needs a PTF.

Since PTFs are built per component, one must check how the four different products can be serviced without applying a PTF to an environment it does not belong to. Below is shown, by help of a truth table, how the PTFs' REQUIRE statements must be coded in order to prevent such a disaster.

The truth table below shows the four products per column and a 1 indicates its presence. Each row shows one environment. Some of these combinations cannot occur because of the different PRE-requisites explained above. This is called an "invalid environment".

Table 14. Truth Table for Finding the Correct REQUIRES Group

012G40	012G50	012G60	012G70	Required PTF
1	0	0	0	PTF1 REQUIRES PRE=(012G40) REQUIRES NOT=(012G50,012G60,012G70) REQUIRES CO=(PTF5) AFFECTS MODULES=(MODA)
1	0	0	1	PTF2 REQUIRES PRE=(012G70) REQUIRES NOT=(012G50,012G60) REQUIRES CO=(PTF5) AFFECTS MODULES=(MODA)
1	0	1	0	PTF3 REQUIRES PRE=(012G60) REQUIRES NOT=(012G50,012G70) REQUIRES CO=(PTF5) AFFECTS MODULES=(MODA)
1	0	1	1	invalid environment (no PTF)
1	1	0	0	PTF4 REQUIRES PRE=(012G50) REQUIRES NOT=(012G60,012G70) REQUIRES CO=(PTF5) AFFECTS MODULES=(MODA)
1	1	0	1	invalid environment (no PTF)
1	1	1	0	invalid environment (no PTF)
1	1	1	1	invalid environment (no PTF)

Four PTFs are needed to fix MODA, one for each product. The REQUIRES groups are shown in the truth table. A fifth PTF is required to supply the corrected MODB for the base product. Its REQUIRE groups describe the four different environments explained in the truth table:

```
PTF5
  REQUIRES PRE=(012G40)
  REQUIRES NOT=(012G50,012G60,012G70)
  REQUIRES CO=(PTF1)
  OR
  REQUIRES PRE=(012G40,012G70)
  REQUIRES NOT=(012G50,012G60)
  REQUIRES CO=(PTF2)
  OR
  REQUIRES PRE=(012G40,012G60)
  REQUIRES NOT=(012G50,012G70)
  REQUIRES CO=(PTF3)
  OR
  REQUIRES PRE=(012G40,012G50)
  REQUIRES NOT=(012G60,012G70)
  REQUIRES CO=(PTF4)
  AFFECTS MODULES=(MODB)
```

Of course, MODB could have been included in PTF1, which fixes the base component. Nevertheless, a separate PTF5 would be required for the remaining three environments, since the other PTFs are not applied to the base component.

Sample for a Complex PTF Structure

The following samples show two PTFs that have a corequisite relationship. Also shown is the use of the SUPERSEDES statement and the use of REQUIRES groups for two products.

```
// JOB UD90367
// OPTION CATAL
*  COMPONENT: 5686-03-206(032DB6)
*  APARS FIXED: DY43306
*  SPECIAL CONDITIONS:
*    COPYRIGHT:            (C) COPYRIGHT IBM CORP.1993
*               LICENSED MATERIAL - PROGRAM PROPERTY OF IBM
*    PLEASE NOTE THAT THIS PTF HAS COREQUISITES.
*  COMMENTS:
*    CROSS REFERENCE-MODULE/MACRO NAMES TO APARS
*     .....
*    CROSS REFERENCE-APARS TO MODULE/MACRO NAMES
*     ......
*
// PAUSE EOB OR CANCEL
// EXEC MSHP
APPLY 5686-032-06-DB6:UD90367 INDIRECT;
REQUIRES PRE=(032DB6);
REQUIRES NOT=(032DB7);
REQUIRES PRE=(UD49152,UD49206,UD48839);
OR
REQUIRES PRE=(032DB6,032DB7);
REQUIRES PRE=(UD49152,UD49206,UD48839);
REQUIRES CO=(UD90368);
SUPERSEDES (UD48894,UD49112,UD49163,UD49221);
RESOLVES APARS=(DY43103,DY43207,DY43275,DY43295,DY43306);
AFFECTS PHASES=($$A$SUPM,$$A$SUPV,$$A$SUPX,$$A$SUP3,$IJBAR,           -
         $IJBDCMD,$IJBHDUP,......),                                   -
        MACROS=(EXTRACT,GETFLD,IJJLBSER,LBSERV,MAPEXTR,               -
         MODCTB,......) TYPE=E;
DATA;
 CATALOG   EXTRACT.E  EOD=YY    REPLACE=YES
...macro EXTRACT
 CATALOG   GETFLD.E  EOD=YY    REPLACE=YES
...macro GETFLD
 CATALOG   IJJLBSER.E  EOD=YY    REPLACE=YES
...macro IJJLBSER
 CATALOG   LBSERV.E  EOD=YY    REPLACE=YES
...macro LBSERV
 CATALOG   MAPEXTR.E  EOD=YY    REPLACE=YES
...macro MAPEXTR
 CATALOG   MODCTB.E  EOD=YY    REPLACE=YES
...macro MODCTB
 CATALOG    ......
...macro ......
/$
DATA;
 PHASE $$A$SUPM,+X'000000'
...phase $$A$SUPM
 PHASE $$A$SUPV,+X'000000'
...phase $$A$SUPV
 PHASE $$A$SUPX,+X'000000'
...phase $$A$SUPX
 PHASE $$A$SUP3,+X'000000'
...phase $$A$SUP3
 PHASE $IJBAR,S+X'000000',SVAPFIX
...phase $IJBAR
 PHASE $IJBDCMD,S+X'000000',SVA
...phase $IJBDCMD
 PHASE $IJBHDUP,S+X'000000',SVA
...phase $IJBHDUP
 PHASE ......
...phase ......
/$
/*
/&
```

Figure 41. PTF for a Base Part of a Component

```
// JOB UD90368
// OPTION CATAL
*  COMPONENT: 5686-03-206(032DB7)
*  APARS FIXED: DY43306
*  SPECIAL CONDITIONS:
*    COPYRIGHT:            (C) COPYRIGHT IBM CORP.1993
*               LICENSED MATERIAL - PROGRAM PROPERTY OF IBM
*    PLEASE NOTE THAT THIS PTF HAS COREQUISITES.
*    ACTION:
*      IN CASE YOU DRIVE YOUR OWN SUPERVISOR YOU HAVE TO RE-ASSEMBLE IT
*      AFTER APPLYING THIS SERVICE.
*      TO GET THE FIXES ACTIVE YOU HAVE TO IPL AFTER SUCCESSFUL
*      ASSEMBLY.
*  COMMENTS:
*    CROSS REFERENCE-MODULE/MACRO NAMES TO APARS
*     .....
*
*    CROSS REFERENCE APARS TO MODULE/MACRO NAMES
*     .....
*
*    THE FOLLOWING MODULES AND/OR MACROS ARE AFFECTED BY THIS PTF:
*
*    MACROS
*     .....
*
*    LISTEND
// PAUSE EOB OR CANCEL
// EXEC MSHP
APPLY 5686-032-06-DB7:UD90368;
REQUIRES PRE=(032DB6,032DB7);
REQUIRES PRE=(UD49222);
REQUIRES CO=(UD90367);
RESOLVES APARS=(DY43306);
AFFECTS MACROS=(DISP,MAPPCE,MAPPUBX,MAPSAACM,MAPTIB,                -
       ......) TYPE=E;
DATA;
 CATALOG   DISP.E  EOD=YY    REPLACE=YES
...macro DISP
 CATALOG   MAPPCE.E  EOD=YY    REPLACE=YES
...macro MAPPCE
 CATALOG   MAPPUBX.E  EOD=YY    REPLACE=YES
...macro MAPPUBX
 CATALOG   MAPSAACM.E  EOD=YY    REPLACE=YES
...macro MAPSAACM
 CATALOG   MAPTIB.E  EOD=YY    REPLACE=YES
...macro MAPTIB
 CATALOG   ......
...macro ......
/$
/*
/&
```

Figure 42. PTF for a Generation Part of a Component

Chapter 14. Shipping PC Code with VSE

Shipping Workstation Code with z/VSE

The workstation file transfer to/from the VSE libraries in VSE significantly simplifies the procedure to distribute workstation products with the z/VSE system. Theoretically, the product owner could simply send the files from the workstation to a z/VSE library as a binary string of data, and the user would download the files from the VSE library to his workstation; this could be done with SEND or RECEIVE as shown in the following example, or with the equivalent function of the emulator that is used.

```
SEND    c\product.EXE c: product EXEBIN (FILE=LIB BINARY L=lib S=sublib
RECEIVE c\product.EXE c: product EXEBIN (FILE=LIB BINARY L=lib S=sublib
```

If the workstation product is to be **serviced** on z/VSE using **MSHP PTFs**, then the following restrictions apply:

- The workstation files must be stored in the VSE library in fixed-80 logical record format.
- The members in the VSE library can only have a one-character member type.

Fixed-80 record format can easily be achieved with the LRECL option of the SEND command.

The one-character member type is an MSHP restriction. (Chapter 11, “Library Member Types,” on page 119 lists the member types allocated for specific use.) Unfortunately it forbids a one-to-one mapping of the member names unless the workstation files have unique file names independent of the file extension. It is the product owner's responsibility to devise a suitable naming scheme for the workstation and VSE library members.

Packaging Workstation Code into a Product Library

The following sample procedure assumes that:

- The workstation product is to be serviced with MSHP and fixed-80 record format is required.
- The product code exists on a workstation attached to a z/VSE.
- The product is installed in sublibrary **PWS.PROD**.
- Product members are stored with member type **X** (refer to Chapter 11, “Library Member Types,” on page 119 for reserved member types).

Proceed as follows:

1. Switch to the host session and sign on to the z/VSE system.
2. Prepare the host session for file transfer (PF6 or fast path 386 from Main Selection Panel).
3. Send product members to the VSE library, for example:

```
SEND  file1.CMD  c: file1  X  (FILE=LIB  L=PWS  S=PROD  BINARY  LRECL=80
SEND  file2.EXE  c: file2  X  (FILE=LIB  L=PWS  S=PROD  BINARY  LRECL=80
SEND  file3.ZIP  c: file3  X  (FILE=LIB  L=PWS  S=PROD  BINARY  LRECL=80
```

The result of the these commands is three files FILE1.X, FILE2.X, and FILE3.X in VSE library PWS.PROD.

Note that this format of the SEND commands applies to all kinds of workstation files, that is, ASCII text files, binary files, compressed files, etc.

Also note that, if the size of the PWS file is not a multiple of 80, the last record is padded with ASCII blanks X'20'. When such a file is received back to the workstation, it will contain these extra blanks. These blanks can be removed by a separate program if they cause problems. Please let us know if you find any problems with these extra blank characters at the end of a file.

4. Prepare the product tape as described in Chapter 7, “Creating Installation Tapes,” on page 77.

Note: It is recommended to send ASCII text in binary form to avoid code page conversion problems.

The Download Procedure

1. Switch to the host session and sign on to the z/VSE system.
2. Prepare the host session for file transfer (PF6 or fast path 386 from Main Selection Panel).
3. Download the product members with the corresponding RECEIVE commands, for example:

```
RECEIVE  file1.CMD  c: file1  X  (FILE=LIB  L=PWS  S=PROD  BINARY
RECEIVE  file2.EXE  c: file2  X  (FILE=LIB  L=PWS  S=PROD  BINARY
RECEIVE  file3.ZIP  c: file3  X  (FILE=LIB  L=PWS  S=PROD  BINARY
```

   The RECEIVE commands are identical with the SEND commands except for the LRECL option that does not apply.

This facility is part of the VSE Workstation File Transfer Support --formerly called Intelligent Workstation Support (IWS)-- which is a CICS application and is included in z/VSE.

Automatic Download

The steps described previously can easily be put into a procedure and automated:

1. Load download procedure (which loads the other files).
2. Run download procedure.

Chapter 15. Job for Customizing

For a discussion of this sample, please refer to “Writing Customizing Jobs” on page 92.

```
..* $$ JOB JNM=IPZINST,DISP=D,CLASS=0
..* $$ PRT DISP=D,CLASS=A
..* $$ PUN DISP=I,CLASS=A
// JOB IPZINST
* ************************************************************
* ** THE JOB IPZINST                                        **
* **  o  INSTALLS THE VSAM CLUSTERS OF DM/VSE               **
* **                                                        **
* **  o  SUBMITS THE FOLLOWING JOBS:                        **
* **     IPZCAFCT - CATALOGS FCT ENTRIES FOR                **
* **                SELECTED DICTIONARIES                   **
* **     IPZCMFCT - CATALOGS FCT ENTRIES FOR MIGRATION      **
* **                                                        **
* **  o  ASSEMBLES AND LINKS CICS BMS MAPS AND              **
* **     THE DM/VSE DISOSS MIGRATION PROGRAM AND            **
* **     LOADS DM/VSE SAMPLE PANELS.                        **
* ************************************************************
* ** IF YOU DON'T INSTALL DM/VSE THE FIRST TIME             **
* ** MAKE SURE THAT THE FOLLOWING FILES ARE CLOSED:         **
* **     DDD*                                               **
/. C     DDDMAST  DDDPDOC  DDDWDOC  DDDRCO   DDDSLG         **
/. C     DDDTRA   DDD2DOC  DDDL3GX                          **
* **     EKL*                                               **
/. C     EKLAFRI  EKLBPOR  EKLDANS  EKLDEUT  EKLDSCH        **
* **     DKL*                                               **
/. C     DKLFONT                                            **
* **     IPZ*                                               **
/. C     IPZDFLT  IPZREST                                   **
* ************************************************************
// PAUSE PRESS ENTER TO CONTINUE
```

Figure 43. Job for Customizing (Part 1 of 5)

```
/. C  ************************************************************
/. C  *  THE FOLLOWING MODIFICATIONS M U S T BE DONE BEFORE RUNNING *
/. C  *  THE JOB IPZINST:                                          *
/. C  *  --  IN EACH LINE DELETE THE STRING '..' WHEN IT APPEARS IN *
/. C  *      THE FIRST TWO COLUMNS.                                *
/. C  *      (SEARCH FOR ..* AND ../)                              *
/. C  *  --  REPLACE THE STRING '-V001-' BY ONE OR MORE VSAM VOLUME *
/. C  *      IDS OWNED BY THE VSAM CATALOG THAT CONTAINS THE       *
/. C  *      VSAM FILES OF DM/VSE.                                 *
/. C  *  --  MODIFY THE FOLLOWING PARAMETERS IF NECESSARY:         *
/. C  *                                                            *
/. C  *      ------------------------------------------------------*
/. C  *      |PARAMETER | PARAMETER| DEFAULT  | DESCRIPTION      |*
/. C  *      |NAME      | TYPE     | VALUE    |                  |*
/. C  *      |----------|----------|----------|------------------|*
/. C  *      |LIB       | SETPARM  | PRD2     | LIBRARY NAME     |*
/. C  *      |----------|----------|----------|------------------|*
/. C  *      |SUBLIB    | SETPARM  | PROD     | SUBLIBRARY NAME  |*
/. C  *      |----------|----------|----------|------------------|*
/. C  *      |TAPE      | SETPARM  | 180      | TAPE UNIT ADDRESS|*
/. C  *      |----------|----------|----------|------------------|*
/. C  *      |CATNAME   | SETPARM  | VSESPUC  | CATALOG NAME     |*
/. C  *      ------------------------------------------------------*
/. C  *                                                            *
/. C  *  --  MODIFY THE FOLLOWING VALUES IF NECESSARY:             *
/. C  *                                                            *
/. C  *      ------------------------------------------------------*
/. C  *      |USED VALUE           |WHERE VALUE IS USED          |*
/. C  *      |---------------------|-----------------------------|*
/. C  *      |PRD2.PROD            | LIBR COMMANDS,              |*
/. C  *      |                     | LIBDEF STATEMENTS           |*
/. C  *      |---------------------|-----------------------------|*
/. C  *      |VSESP.USER.CATALOG   | VSAM CATALOG ID             |*
/. C  *      ------------------------------------------------------*
/. C  *                                                            *
/. C  *  --  MODIFY THE SETPARM PARAMETERS LISTED IN THE PARAMETER  *
/. C  *      LIST (USER SELECTION) TO YOUR NEEDS.                  *
/. C  ************************************************************
/. C  * NOTE:                                                     *
/. C  * -->  "PRD2.PROD" IS ASSUMED TO BE THE LIBRARY WHERE YOU    *
/. C  *      RESTORE THE CONTENTS OF THE TAPE DM/VSE120 BASE1OF3   *
/. C  *      AND DM/VSE120 BASE3OF3.                               *
/. C  *      IF YOU USE A DIFFERENT SUBLIBRARY MODIFY              *
/. C  *        o  THE LIB AND SUBLIB PARAMETER (USER SELECTION)    *
/. C  *      LOCATE "PRD2.PROD" AND MODIFY                         *
/. C  *        o  ONE LIBR STATEMENT TO CATALOG IPZFCTM6/7 (PART1.6)*
/. C  *        o  ONE LIBR STATEMENT TO CATALOG DDDLEX16/17 (PART 6)*
/. C  * -->  ALL DM/VSE FILES WILL BE CREATED IN VSAM MANAGED SPACE.*
/. C  *      IF YOU USE DIFFERENT VSAM CATALOGS MODIFY THE JOB     *
/. C  *      IPZINST TO YOUR NEEDS.  (FOR EXAMPLE, DLBL, SETPARM   *
/. C  *      (STATEMENTS AND THE VSAM CATALOG ID                   *
/. C  *       IN VSAM STATEMENTS).                                 *
/. C  ************************************************************
```

Figure 43. Job for Customizing (Part 2 of 5)

```
/. C
/. C  ****************************************************************
/. C  ****************************************************************
/. C  *                                                              *
/. C  *  START OF PARAMETER LIST   (USER SELECTION)                  *
/. C  *                                                              *
/. C  ****************************************************************
/. C  ****************************************************************
/. C
/. C  * ------------------------------------------------------------*
/. C  * CHANGE THE PARAMETERS TO YOUR NEEDS.                        *
/. C  * ------------------------------------------------------------*
/. C  LIB.SUBLIB CONTAINS DM/VSE (DM/VSE120 BASE1OF3 AND BASE3OF3)
/. C  THE LIB AND SUBLIB PARAMETER ARE ALSO USED FOR THE
/. C  LIBR COMMANDS IN PART3 (LANGUAGE SELECTION).
// SETPARM LIB=PRD2              LIBRARY
// SETPARM SUBLIB=PROD           SUBLIBRARY
/. C
/. C  FOLLOWING LIBDEF STATEMENTS ARE ACTIVE FOR THE ENTIRE JOB
// LIBDEF *,SEARCH=&LIB..&SUBLIB
// LIBDEF PHASE,CATALOG=&LIB..&SUBLIB
/. C
// SETPARM TAPE=180               TAPE UNIT ADDRESS (USED FOR THE TAPE
/. C                              DM/VSE120 BASE2OF3)
// SETPARM CATNAME=VSESPUC        CATALOG NAME FOR VSAM CLUSTER
/. C
/. C  * ------------------------------------------------------------*
/. C  * SELECT THE DM/VSE INSTALLATION LEVEL:                       *
/. C  * TYPE 0   IF THIS IS THE FIRST INSTALLATION OF DM/VSE       *
/. C  * TYPE 110 IF YOU HAVE ALREADY INSTALLED DM/VSE 1.1.0        *
/. C  * TYPE 111 IF YOU HAVE ALREADY INSTALLED DM/VSE 1.1.1        *
/. C  * TYPE 112 IF YOU HAVE ALREADY INSTALLED DM/VSE 1.1.2        *
/. C  * TYPE 120 IF YOU HAVE ALREADY INSTALLED DM/VSE 1.2.0        *
/. C  * ------------------------------------------------------------*
/. C
// SETPARM ILEVEL=0               DM/VSE INSTALLATION LEVEL
/. C
/. C  * ------------------------------------------------------------*
/. C  * SELECT THE CICS/DOS/VS INSTALLATION LEVEL:                  *
/. C  * TYPE 6   IF YOU INSTALL DM/VSE ON A VSE/SP WITH CICS 1.6    *
/. C  * TYPE 7   IF YOU INSTALL DM/VSE ON A VSE/SP WITH CICS 1.7    *
/. C  * ------------------------------------------------------------*
/. C
// SETPARM JLEVEL=7              CICS/DOS/VS INSTALLATION LEVEL
/. C
/. C  * ------------------------------------------------------------*
```

Figure 43. Job for Customizing (Part 3 of 5)

```
/. C  * SELECT THE LANGUAGE BY TYPING YES/NO.                          *
/. C  * US ENGLISH IS REQUIRED AND ALWAYS INSTALLED.                  *
/. C  * EACH LANGUAGE SELECTION CAUSES AUTOMATICALLY A DICTIONARY    *
/. C  * SELECTION.                                                    *
/. C  * NOTE: YOU CAN LOAD A LANGUAGE ONLY IF THE SETPARM PARAMETER *
/. C  *       "PART3" IS SET TO YES.                                  *
/. C  *       TAKE CARE WHEN RELOADING A LANGUAGE,                    *
/. C  *       FOR EXAMPLE, MODIFICATIONS OF CLISTS AREL LOST.         *
/. C  * ------------------------------------------------------------*
/. C
// SETPARM BPORT=NO               BRAZIL       LANGUAGE SELECTION
// SETPARM DANSK=NO               DANISH       LANGUAGE SELECTION
// SETPARM DEUTS=NO               GERMAN       LANGUAGE SELECTION
/. C  * ------------------------------------------------------------*
/. C  * SELECT DICTIONARIES BY TYPING YES/NO                         *
/. C  * (US ENGLISH IS ALWAYS INSTALLED)                            *
/. C  * NOTE: YOU CAN LOAD A DICTIONARY ONLY IF SETPARM PARAMETER   *
/. C  *       "PART4" IS SET TO YES.                                  *
/. C  *       A SELECTION OF DICTIONARIES CAUSES THE JOB IPZCAFCT    *
/. C  *       TO CATALOG IPZFCT2.A OR IPZFCT3.A (FCT ENTRIES).       *
/. C  *       IF A DICTIONARY IS SELECTED THE CORRESPONDING          *
/. C  *       FCT ENTRY IS ADDED ELSE DROPPED.                       *
/. C  * ------------------------------------------------------------*
// SETPARM BPOR=NO                BRAZIL       DICTIONARY
// SETPARM DANS=NO                DANISH       DICTIONARY
// SETPARM DEUT=NO                GERMAN       DICTIONARY
/. C
/. C  * ------------------------------------------------------------*
/. C  *                                                             *
/. C  * SELECT THE PART(S) YOU WANT TO PROCESS BY TYPING YES/NO     *
/. C  * ------------------------------------------------------------*
/. C  * SETPARM  | DESCRIPTION OF THE SETPARM PARAMETER             *
/. C  * PARAMETER|                                                  *
/. C  * ------------------------------------------------------------*
/. C  *   PART1  | BASIC INSTALLATION OF DM/VSE                     *
/. C  *          | 1.1 DELETES AND ADDS STANDARD LABELS FOR         *
/. C  *          |     THE VSAM FILES OF DM/VSE                     *
/. C  *          | 1.2 DELETES VSAM CLUSTERS OF DM/VSE AND          *
/. C  *          |     PREPARES MIGRATION                           *
/. C  *          | 1.3 DEFINES VSAM CLUSTERS FOR MASTER FILE AND    *
/. C  *          |     LOADS BASIC LANGUAGE CLIST DOCUMENTS         *
/. C  *          | 1.4 DEFINES AND LOADS THE RESTORE FILE           *
/. C  *          | 1.5 DEFINES AND INITIALIZES THE SAMPLE DATA SET  *
/. C  *          | 1.6 CREATES JOB TO CATALOG FCT MIGRATION ENTRIES *
/. C  * ------------------------------------------------------------*
/. C  *   PART2  | DELETES, DEFINES, AND INITIALIZES                *
/. C  *          | DW/370 WORKING CLUSTERS                          *
/. C  * ------------------------------------------------------------*
/. C  *   PART3  | LOADS LANGUAGE DOCUMENTS                        *
/. C  * ------------------------------------------------------------*
/. C  *   PART4  | PREPARES AND LOADS LANGUAGE DICTIONARIES         *
/. C  *          | FROM TAPE DM/VSE120 BASE2OF3                     *
/. C  * ------------------------------------------------------------*
```

Figure 43. Job for Customizing (Part 4 of 5)

```
/. C  *   PART5  | DEFINES AND LOADS FONT TABLES                    *
/. C  * ---------------------------------------------------------*
/. C  *   PART6  | CREATES A JOB STREAM TO CATALOG THE FCT ENTRIES  *
/. C  *          | FOR SELECTED DICTIONARIES AND MIGRATION          *
/. C  * ---------------------------------------------------------*
/. C  *   PART7  | ASSEMBLES AND LINKS DW/370 PROVIDED CICS BMS MAPS*
/. C  * ---------------------------------------------------------*
/. C  *   PART8  | LINKS DM/VSE DISOSS MIGRATION PROGRAM IPZDISSV   *
/. C  *          | AND LOADS THE SAMPLE PANELS OF DM/VSE            *
/. C  * ---------------------------------------------------------*
/. C
// SETPARM PART1=YES              BASIC INSTALLATION
// SETPARM PART2=YES              DW/370 WORKING CLUSTER
// SETPARM PART3=YES              LANGUAGE DOCUMENTS
// SETPARM PART4=YES              LANGUAGE DICTIONARIES
// SETPARM PART5=YES              FONTS
// SETPARM PART6=YES              BUILD DM/VSE FCT ENTRIES
// SETPARM PART7=YES              ASSEMBLE AND LINK CICS BMS MAPS
// SETPARM PART8=YES              LINK DM/VSE DISOSS MIGRATION PROG
/. C
/. C  ************************************************************
/. C  ************************************************************
/. C  *                                                          *
/. C  *  END OF PARAMETER LIST     (USER SELECTION)              *
/. C  *                                                          *
/. C  ************************************************************
/. C  ************************************************************
/. C
/. C  ************************************************************
/. C  ************************************************************
/. C  *                                                          *
/. C  *  START OF THE INSTALLATION PROCEDURE                     *
/. C  *                                                          *
/. C  ************************************************************
/. C  ************************************************************
/. C
/. C  * ---------------------------------------------------------*
/. C  * SET DICTIONARY SETPARM STATEMENTS CORRESPONDING TO THE    *
/. C  * LANGUAGE SELECTION                                       *
/. C  * ---------------------------------------------------------*
IF BPORT = YES THEN
// SETPARM BPOR=YES
IF DANSK = YES THEN
// SETPARM DANS=YES
IF DEUTS = YES THEN
// SETPARM DEUT=YES
/. C  * ---------------------------------------------------------*
/. C  * CHECK SETPARM PARAMETERS:                                 *
/. C  * IF THE SETPARMS ARE NOT ASSIGNED TO VALID VALUES         *
/. C  * THE JOB IS TERMINATED AND A MESSAGE IS WRITTEN.          *
/. C  * ---------------------------------------------------------*
```

Figure 43. Job for Customizing (Part 5 of 5)

Glossary

This glossary includes terms and definitions for IBM z/VSE.

The following cross-references are used in this glossary:

1. See refers the reader from a term to a preferred synonym, or from an acronym or abbreviation to the defined full form.
2. See also refers the reader to a related or contrasting term.

A

Access Control Logging and Reporting

An IBM licensed program to log all attempts of access to protected data and to print selected formatted reports on such attempts.

access control table (DTSECTAB)

A table that is used by the system to verify a user's right to access a certain resource.

access list

A table in which each entry specifies an address space or data space that a program can reference.

access method

A program, that is, a set of commands (macros) to define files or addresses and to move data to and from them; for example VSE/VSAM or VTAM.

account file

A disk file that is maintained by VSE/POWER containing accounting information that is generated by VSE/POWER and the programs running under VSE/POWER.

addressing mode (AMODE)

A program attribute that refers to the address length that a program is prepared to handle on entry. Addresses can be either 24 bits, 31 bits, or 64 bits in length. In 24 bit addressing mode, the processor treats all virtual addresses as 24-bit values; in 31 bit addressing mode, the processor treats all virtual addresses as 31-bit values and in 64-bit addressing mode, the processor treats all virtual addresses as 64-bit values. Programs with an addressing mode of ANY can receive control in either 24 bit or 31 bit addressing mode. 64 bit addressing mode cannot be used as program attribute.

administration console

In z/VSE, one or more consoles that receive all system messages, except for those that are directed to one particular console. Contrast this with the user console, which receives only those messages that are directed to it, for example messages that are issued from a job that was submitted with the request to echo its messages to that console. The operator of an administration console can reply to all outstanding messages and enter all system commands.

alternate block

On an FBA disk, a block that is designated to contain data in place of a defective block.

alternate index

In systems with VSE/VSAM, the index entries of a given base cluster that is organized by an alternate key, that is, a key other than the prime key of the base cluster. For example, a personnel file preliminary ordered by names can be indexed also by department number.

alternate library

An interactively accessible library that can be accessed from a terminal when the user of that terminal issues a connect or switch library request.

alternate track

A library, which becomes accessible from a terminal when the user of that terminal issues a connect or switch (library) request.

AMODE

Addressing mode.

APA

All points addressable.

APAR

Authorized Program Analysis Report.

appendage routine

A piece of code that is physically located in a program or subsystem, but logically and extension of a supervisor routine.

application profile

A control block in which the system stores the characteristics of one or more application programs.

application program

A program that is written for or by a user that applies directly to the user's work, such as a program that does inventory control or payroll. See also batch program and online application program.

AR/GPR

Access register and general-purpose register pair.

ASC mode

Address space control mode.

ASI (automated system initialization) procedure

A set of control statements, which specifies values for an automatic system initialization.

attention routine (AR)

A routine of the system that receives control when the operator presses the Attention key. The routine sets up the console for the input of a command, reads the command, and initiates the system service that is requested by the command.

automated system initialization (ASI)

A function that allows control information for system startup to be cataloged for automatic retrieval during system startup.

autostart

A facility that starts VSE/POWER with little or no operator involvement.

auxiliary storage

Addressable storage that is not part of the processor, for example storage on a disk unit. Synonymous with external storage.

B

B-transient

A phase with a name beginning with $$B and running in the Logical Transient Area (LTA). Such a phase is activated by special supervisor calls.

bar

2 GigyByte (GB) line

basic telecommunications access method (BTAM)

An access method that permits read and write communication with remote devices. BTAM is not supported on z/VSE.

BIG-DASD

A subtype of Large DASD that has a capacity of more than 64 K tracks and uses up to 10017 cylinders of the disk.

block

Usually, a block consists of several records of a file that are transmitted as a unit. But if records are very large, a block can also be part of a record only. On an FBA disk, a block is a string of 512 bytes of data. See also a control block.

block group

In VSE/POWER, the basic organizational unit for fixed-block architecture (FBA) devices. Each block group consists of a number of 'units of transfer' or blocks.

C

CA splitting

Is the host part of the VSE JavaBeans, and is started using the job STARTVCS, which is placed in the reader queue during installation of z/VSE. Runs by default in dynamic class R. In VSE/VSAM, to double a control area dynamically and distribute its CIs evenly when the specified minimum of free space get used up by more data.

carriage control character

The fist character of an output record (line) that is to be printed; it determines how many lines should be skipped before the next line is printed.

catalog

A directory of files and libraries, with reference to their locations. A catalog may contain other information such as the types of devices in which the files are stored, passwords, blocking factors. To store a library member such as a phase, module, or book in a sublibrary. See also VSE/VSAM catalog.

cell pool

An area of virtual storage that is obtained by an application program and managed by the callable cell pool services. A cell pool is located in an address space or a data space and contains an anchor, at least one extent, and any number of cells of the same size.

central location

The place at which a computer system's control device, normally the systems console in the computer room, is installed.

chained sublibraries

A facility that allows sublibraries to be chained by specifying the sequence in which they must be searched for a certain library member.

chaining

A logical connection of sublibraries to be searched by the system for members of the same type (phases or object modules, for example).

channel command word (CCW)

A doubleword at the location in main storage that is specified by the channel address word. One or more CCWs make up the channel program that directs data channel operations.

channel program

One or more channel command words that control a sequence of data channel operations. Execution of this sequence is initiated by a start subchannel instruction.

channel scheduler

The part of the supervisor that controls all input/output operations.

channel subsystem

A feature of z/Architecture that provides extensive additional channel (I/O) capabilities to IBM Z.

channel to channel attachment (CTCA)

A function that allows data to be exchanged

1. Under the control of VSE/POWER between two virtual VSE machines running under VM or
2. Under the control of VTAM between two processors.

character-coded request

A request that is encoded and transmitted as a character string. Contrast with *field-formatted request*.

checkpoint

1. A point at which information about the status of a job and the system can be recorded so that the job step can be restarted later.
2. To record such information.

CICS (Customer Information Control System)

An IBM program that controls online communication between terminal users and a database. Transactions that are entered at remote terminals are processed concurrently by user-written application programs. The program includes facilities for building, using, and servicing databases.

CICS ECI

The CICS External Call Interface (ECI) is one possible requester type of the *CICS business logic interface* that is provided by the CICS Transaction Server for z/VSE. It is part of the CICS client and allows workstation programs to CICS function on the z/VSE host.

CICS EXCI

The EXternal CICS Interface (EXCI) is one possible requester type of the *CICS business logic interface* that is provided by the CICS Transaction Server for z/VSE. It allows any BSE batch application to call CICS functions.

CICS system definition data set (CSD)

A VSAM KSDS cluster that contains a resource definition record for every record defined to CICS using resource definition online (RDO).

CICS Transaction Server for z/VSE

A z/VSE base program that controls online communication between terminal users and a database. This is the successor system to CICS/VSE.

CICS TS

CICS Transaction Server

CICS/VSE

Customer Information Control System/VSE. No longer shipped on the Extended Base Tape and no longer supported, cannot run on z/VSE 5.1 or later.

class

In VSE/POWER, a group of jobs that either come from the same input device or go to the same output device.

CMS

Conversational monitor system running on z/VM.

common library

A library that can be interactively accessed by any user of the (sub)system that owns the library.

communication adapter

A circuit card with associated software that enables a processor, controller, or other device to be connected to a network.

communication region

An area of the supervisor that is set aside for transfer of information within and between programs.

component

1. Hardware or software that is part of a computer system.
2. A functional part of a product, which is identified by a component identifier.
3. In z/VSE, a component program such as VSE/POWER or VTAM.
4. In VSE/VSAM, a named, cataloged group of stored records, such as the data component or index component of a key-sequenced file or alternate index.

component identifier

A 12-byte alphanumeric string, uniquely defining a component to MSHP.

conditional job control

The capability of the job control program to process or to skip one or more statements that are based on a condition that is tested by the program.

connect

To authorize library access on the lowest level. A modifier such as "read" or "write" is required for the specified use of a sublibrary.

connection pooling

Introduced with an z/VSE 5.1 update to manage (reuse) connections of the z/VSE database connector in CICS TS.

connector

In the context of z/VSE, a connector provides the middleware to connect two platforms: Web Client and z/VSE host, middle-tier and z/VSE host, or Web Client and middle-tier.

connector (e-business connector)

A piece of software that is provided to connect to heterogeneous environments. Most connectors communicate to non-z/VSE Java-capable platforms.

container

Is part of the JVM of application servers such as the IBM WebSphere Application Server, and facilitates the implementation of servlets, EJBs, and JSPs, by providing resource and transaction management resources. For example, an EJB developer must not code against the JVM of the application server, but instead against the interface that is provided by the container. The main role of a container is to act as an intermediary between EJBs and clients, Is the host part of the VSE JavaBeans, and is started using the job STARTVCS, which is placed in the reader queue during the installation of z/VSE. Runs by default in dynamic class R. and also to manage multiple EJB instances. After EJBs have been written, they must be stored in a container residing on an application server. The container then manages all threading and client-interactions with the EJBs, and co-ordinate connection- and instance pooling.

control interval (CI)

A fixed-length area of disk storage where VSE/VSAM stores records and distributes free space. It is the unit of information that VSE/VSAM transfers to or from disk storage. For FBA it must be an integral multiple to be defined at cluster definition, of the block size.

control program

A program to schedule and supervise the running of programs in a system.

conversational monitor system (CMS)

A virtual machine operating system that provides general interactive time sharing, problem solving, and program development capabilities and operates under the control of z/VM.

count-key-data (CKD) device

A disk device that store data in the record format: count field, key field, data field. The count field contains, among others, the address of the record in the format: cylinder, head (track), record number, and the length of the data field. The key field, if present, contains the record's key or search argument. CKD disk space is allocated by tracks and cylinders. Contrast with *FBA disk device. See also extended count-key-data device.*

cross-partition communication control

A facility that enables VSE subsystems and user programs to communicate with each other; for example, with VSE/POWER.

cryptographic token

Usually referred to simply as a *token*, this is a device, which provides an interface for performing cryptographic functions like generating digital signatures or encrypting data.

cryptography

1. A method for protecting information by transforming it (encrypting it) into an unreadable format, called ciphertext. Only users who possess a secret key can decipher (or decrypt) the message into plaintext.
2. The transformation of data to conceal its information content and to prevent its unauthorized use or undetected modification .

D

data block group

The smallest unit of space that can be allocated to a VSE/POWER job on the data file. This allocation is independent of any device characteristics.

data conversion descriptor file (DCDF)

With a DCDF, you can convert individual fields within a record during data transfer between a PC and its host. The DCDF defines the record fields of a particular file for both, the PC and the host environment.

data import

The process of reformatting data that was used under one operating system such that it can subsequently be used under a different operating system.

Data Interfile Transfer, Testing, and Operations (DITTO) utility

An IBM program that provides file-to-file services for card I/O, tape, and disk devices. The latest version is called DITTO/ESA for VSE.

Data Language/I (DL/I)

A database access language that is used with CICS.

data link

In SNA, the combination of the link connection and the link stations joining network noes, for example, a z/Architecture channel and its associated protocols. A link is both logical and physical.

data security

The protection of data against unauthorized disclosure, transfer, modification, or destruction, whether accidental or intentional .

data set header record

In VSE/POWER abbreviated as DSHR, alias NDH or DSH. An NJE control record either preceding output data or, in the middle of input data, indicating a change in the data format.

data space

A range of up to 2 gigabytes of contiguous virtual storage addresses that a program can directly manipulate through z/Architecture instructions. Unlike an address space, a data space can hold only user data; it does not contain shared areas, or programs. Instructions do not execute in a data space. Contrast with address space.

data terminal equipment (DTE)

In SNA, the part of a data station that serves a data source, data sink, or both.

database connector

Is a function introduced with z/VSE 5.1.1, which consists of a client and server part. The client provides an API (CBCLI) to be used by applications on z/VSE, the server on any Java capable platform connects a JDBC driver that is provided by the database. Both client and server communicate via TCP/IP.

Database 2 (Db2)

An IBM rational database management system.

Db2-based connector

Is a feature introduced with VSE/ESA 2.5, which includes a customized Db2 version, together with VSAM and DL/I functionality, to provide access to Db2, VSAM, and DL/I data, using Db2 Stored Procedures.

Db2 Runtime only Client edition

The Client Edition for z/VSE comes with some enhanced features and improved performance to integrate z/VSE and Linux on z Systems.

Db2 Stored Procedure

In the context of z/VSE, a Db2 Stored Procedure is a Language Environment (LE) program that accesses Db2 data. However, from VSE/ESA 2.5 onwards you can also access VSAM and DL/I data using a Db2 Stored Procedure. In this way, it is possible to exchange data between VSAM and Db2.

DBLK

Data block.

DCDF

Data conversion descriptor file.

deblocking

The process of making each record of a block available for processing.

dedicated (disk) device

A device that cannot be shared among users.

device address

1. The identification of an input/output device by its device number.
2. In data communication, the identification of any device to which data can be sent or from which data can be received.

device driving system (DDS)

A software system external to VSE/POWER, such as a CICS spooler or PSF, that writes spooled output to a destination device.

Device Support Facilities (DSF)

An IBM supplied system control program for performing operations on disk volumes so that they can be accessed by IBM and user programs. Examples of these operations are initializing a disk volume and assigning an alternative track.

device type code

The four- or five-digit code that is used for defining an I/O device to a computer system. See also ICKDSF

dialog

In an interactive system, a series of related inquiries and responses similar to a conversation between two people. For z/VSE, a set of panels that can be used to complete a specific task; for example, defining a file.

dialog manager

The program component of z/VSE that provides for ease of communication between user and system.

digital signature

In computer security, encrypted data, which is appended to or part of a message, that enables a recipient to prove the identity of the sender.

Digital Signature Algorithm (DSA)

The Digital Signature Algorithm is the US government-defined standard for digital signatures. The DSA digital signature is a pair of large numbers, computed using a set of rules (that is, the DSA) and a set of parameters such that the identity of the signatory and integrity of the data can be verified. The DSA provides the capability to generate and verify signatures.

directory

In z/VSE the index for the program libraries.

direct access

Accessing data on a storage device using their address and not their sequence. This is the typical access on disk devices as opposed to magnetic tapes. Contrast with *sequential access*.

disk operating system residence volume (DOSRES)

The disk volume on which the system sublibrary IJSYSRS.SYSLIB is located including the programs and procedures that are required for system startup.

disk sharing

An option that lets independent computer systems uses common data on shared disk devices.

disposition

A means of indicating to VSE/POWER how a job input or output entry is to be handled: according to its local disposition in the RDR/LST/PUN queue or its transmission disposition when residing in the XMT queue. A job might, for example, be deleted or kept after processing.

distribution tape

A magnetic tape that contains, for example, a preconfigured operating system like z/VSE. This tape is shipped to the customer for program installation.

DITTO/ESA for VSE

Data Interfile Transfer, Testing, and Operations utility. An IBM program that provides file-to-file services for disk, tape, and card devices.

DSF

Device Support Facilities.

DSH (R)

Data set header record.

dummy device

A device address with no real I/O device behind it. Input and output for that device address are spooled on disk.

duplex

Pertaining to communication in which data can be sent and received at the same time.

DU-AL (dispatchable unit - access list)

The access list that is associated with a z/VSE main task or subtask. A program uses the DU-AL associated with its task and the PASN-AL associated with its partition. See also “PASN-AL (primary address space number - access list)” on page 160.

dynamic class table

Defines the characteristics of dynamic partitions.

dynamic partition

A partition that is created and activated on an 'as needed' basis that does not use fixed static allocations. After processing, the occupied space is released. Dynamic partitions are grouped by class, and jobs are scheduled by class. Contrast with *static partition*.

dynamic space reclamation

A librarian function that provides for space that is freed by the deletion of a library member to become reusable automatically.

E

ECI

See “CICS ECI” on page 143.

emulation

The use of programming techniques and special machine features that permit a computer system to execute programs that are written for another system or for the use of I/O devices different from those that are available.

emulation program (EP)

An IBM control program that allows a channel-attached 3705 or 3725 communication controller to emulate the functions of an IBM 2701 Data Adapter Unit, or an IBM 2703 Transmission Control.

end user

1. A person who makes use of an application program.
2. In SNA, the ultimate source or destination of user data flowing through an SNA network. Might be an application program or a terminal operator.

Enterprise Java Bean

An EJB is a distributed bean. "Distributed" means, that one part of an EJB runs inside the JVM of a web application server, while the other part runs inside the JVM of a web browser. An EJB either represents one data row in a database (entity bean), or a connection to a remote database (session bean). Normally, both types of an EJB work together. This allows to represent and access data in a standardized way in heterogeneous environments with relational and non-relational data. See also *JavaBean*.

entry-sequenced file

A VSE/VSAM file whose records are loaded without respect to their contents and whose relative byte addresses cannot change. Records are retrieved and stored by addressed access, and new records are added to the end of the file.

Environmental Record Editing and Printing (EREP) program

A z/VSE base program that makes the data that is contained in the system record file available for further analysis.

EPI

See *CICS EPI.*

ESCON Channel (Enterprise Systems Connection Channel)

A serial channel, using fiber optic cabling, that provides a high-speed connection between host and control units for I/O devices. It complies with the ESA/390 and IBM Z I/O Interface until z114. The zEC12 processors do not support ESCON channels.

exit routine

1. Either of two types of routines: installation exit routines or user exit routines. Synonymous with exit program.
2. See *user exit routine*.

extended addressability

The ability of a program to use 31 bit or 64 bit virtual storage in its address space or outside the address space.

extended recovery facility (XRF)

In z/VSE, a feature of CICS that provides for enhanced availability of CICS by offering one CICS system as a backup of another.

External Security Manager (ESM)

A priced vendor product that can provide extended functionality and flexibility that is compared to that of the Basic Security Manager (BSM), which is part of z/VSE.

F

FASTCOPY

See "VSE/Fast Copy" on page 171.

fast copy data set program (VSE/Fast Copy)

See "VSE/Fast Copy" on page 171.

fast service upgrade (FSU)

A service function of z/VSE for the installation of a refresh release without regenerating control information such as library control tables.

FAT-DASD

A subtype of Large DASD, it supports a device with more than 4369 cylinders (64 K tracks) up to 64 K cylinders.

FCOPY

See *VSE/Fast Copy.*

fence

A separation of one or more components or elements from the remainder of a processor complex. The separation is by logical boundaries. It allows simultaneous user operations and maintenance procedures.

fetch

1. To locate and load a quantity of data from storage.

2. To bring a program phase into virtual storage from a sublibrary and pass control to this phase.
3. The name of the macro instruction (FETCH) used to accomplish 2. See also *loader.*

Fibre Channel Protocol (FCP)

A combination of hardware and software conforming to the Fibre Channel standards and allowing system and peripheral connections via FICON and FICON Express feature cards on IBM zSeries processors. In z/VSE, zSeries FCP is employed to access industry-standard SCSI disk devices.

fragmentation (of storage)

Inability to allocate unused sections (fragments) of storage in the real or virtual address range of virtual storage.

FSU

Fast service upgrade.

FULIST (FUnction LIST)

A type of selection panel that displays a set of files and/or functions for the choice of the user.

G

generation

See *macro generation.*

generation feature

An IBM licensed program order option that is used to tailer the object code of a program to user requirements.

GETVIS space

Storage space within partition or the shared virtual area, available for dynamic allocation to programs.

guest system

A data processing system that runs under control of another (host) system. On the mainframe z/VSE can run as a guest of z/VM.

H

hard wait

The condition of a processor when all operations are suspended. System recovery from a hard wait is impossible without performing a new system startup.

hash function

A hash function is a transformation that takes a variable-size input and returns a fixed-size string, which is called the hash value. In cryptography, the hash functions should have some additional properties:

- The hash function should be easy to compute.
- The hash function is one way; that is, it is impossible to calculate the 'inverse' function.

- The hash function is collision-free; that is, it is impossible that different input leads to the same hash value.

hash value

The fixed-sized string resulting after applying a *hash function* to a text.

High-Level Assembler for VSE

A programming language providing enhanced assembler programming support. It is a base program of z/VSE.

home interface

Provides the methods to instantiate a new EJB object, introspect an EJB, and remove an EJB instantiation., as for the remote interface is needed because the deployment tool generates the implementation class. Every Session bean's home interface must supply at least one *create()* method.

host mode

In this operating mode, a PC can access a VSE host. For programmable workstation (PWS) functions, the Move Utilities of VSE can be used.

host system

The controlling or highest level system in a data communication configuration.

host transfer file (HTF)

Used by the Workstation File Transfer Support of z/VSE as an intermediate storage area for files that are sent to and from IBM personal computers.

HTTP Session

In the context of z/VSE, identifies the web-browser client that calls a servlet (in other words, identifies the connection between the client and the middle-tier platform).

I

ICCF

See *VSE/ICCF.*

ICKDSF (Device Support Facilities)

A z/VSE base program that supports the installation, use, and maintenance of IBM disk devices.

include function

Retrieves a library member for inclusion in program input.

index

1. A table that is used to locate records in an indexed sequential data set or on indexed file.
2. In, an ordered collection of pairs, each consisting of a key and a pointer, used by to sequence and locate the records of a key-sequenced data set or file; it is organized in levels of index records. See also *alternate index.*

input/output control system (IOCS)

A group of IBM supplied routines that handle the transfer of data between main storage and auxiliary storage devices.

integrated communication adapter (ICA)

The part of a processor where multiple lines can be connected.

integrated console

In z/VSE, the service processor console available on IBM Z that operates as the z/VSE system console. The integrated console is typically used during IPL and for recovery purposes when no other console is available.

Interactive Computing and Control Facility (ICCF)

An IBM licensed program that serves as interface, on a time-slice basis, to authorized users of terminals that are linked to the system's processor.

interactive partition

An area of virtual storage for the purpose of processing a job that was submitted interactively via VSE/ICCF.

Interactive User Communication Vehicle (IUCV)

Programming support available in a VSE supervisor for operation under z/VM. The support allows users to communicate with other users or with CP in the same way they would with a non-preferred guest.

intermediate storage

Any storage device that is used to hold data temporarily before it is processed.

IOCS

Input/output control system.

IPL

Initial program load.

irrecoverable error

An error for which recovery is impossible without the use of recovery techniques external to the computer program or run.

IUCV

Interactive User Communication Vehicle.

J

JAR

Is a platform-independent file format that aggregates many files into one. Multiple applets and their requisite components (.class files, images, and sounds) can be bundled in a JAR file, and then downloaded to a web browser using a single HTTP transaction (much improving the download speed). The JAR format also supports compression, which reduces the files size (and further improves the

download speed). The compression algorithm that is used is fully compatible with the ZIP algorithm. The owner of an applet can also digitally sign individual entries in a JAR file to authenticate their origin.

Java application

A Java program that runs inside the JVM of your web browser. The program's code resides on a local hard disk or on the LAN. Java applications might be large programs using graphical interfaces. Java applications have unlimited access to all your local resources.

Java bytecode

Bytecode is created when a file containing Java source language statements is compiled. The compiled Java code or "bytecode" is similar to any program module or file that is ready to be executed (run on a computer so that instructions are performed one at a time). However, the instructions in the bytecode are really instructions to the *Java Virtual Machine*. Instead of being interpreted one instruction at a time, bytecode is instead recompiled for each operating-system platform using a just-in-time (JIT) compiler. Usually, this enables the Java program to run faster. Bytecode is contained in binary files that have the suffix**.CLASS**

Java servlet

See *servlet.*

JHR

Job header record.

job accounting interface

A function that accumulates accounting information for each job step, to be used for charging the users of the system, for planning new applications, and for supervising system operation more efficiently.

job accounting table

An area in the supervisor where accounting information is accumulated for the user.

job catalog

A catalog made available for a job by means of the file name IJSYSUC in the respective DLBL statement.

job entry control language (JECL)

A control language that allows the programmer to specify how VSE/POWER should handle a job.

job step

In 1 of a group of related programs complete with the JCL statements necessary for a particular run. Every job step is identified in the job stream by an EXEC statement under one JOB statement for the whole job.

job trailer record (JTR)

As VSE/POWER parameter JTR, alias NJT. An NJE control record terminating a job entry in the input or output queue and providing accounting information.

K

key

In VSE/VSAM, one or several characters that are taken from a certain field (key field) in data records for identification and sequence of index entries or of the records themselves.

key sequence

The collating sequence either of records themselves or of their keys in the index or both. The key sequence is alphanumeric.

key-sequenced file

A VSE/VSAM file whose records are loaded in key sequence and controlled by an index. Records are retrieved and stored by keyed access or by addressed access, and new records are inserted in the file in key sequence.

KSDS

Key-sequenced data sets. See *key-sequenced file.*

L

label

1. An identification record for a tape, disk, or diskette volume or for a file on such a volume.
2. In assembly language programming, a named instruction that is generally used for branching.

label information area

An area on a disk to store label information that is read from job control statements or commands. Synonymous with *label area*.

Language Environment for z/VSE

An IBM software product that is the implementation of Language Environment on the VSE platform.

language translator

A general term for any assembler, compiler, or other routine that accepts statements in one language and produces equivalent statements in another language.

Large DASD

A DASD device that

1. Has a capacity exceeding 64 K tracks and
2. Does not have VSAM space created prior to VSE/ESA 2.6 that is owned by a catalog.

LE/VSE

Short form of Language Environment for z/VSE.

librarian

The set of programs that maintains, services, and organizes the system and private libraries.

library block

A block of data that is stored in a sublibrary.

library directory

The index that enables the system to locate a certain sublibrary of the accessed library.

library member

The smallest unit of a data that can be stored in and retrieved from a sublibrary.

line commands

In VSE/ICCF, special commands to change the declaration of individual lines on your screen. You can copy, move, or delete a line declaration, for example.

linkage editor

A program that is used to create a phase (executable code) from one or more independently translated object modules, from one or more existing phases, or from both. In creating the phase, the linkage editor resolves cross-references among the modules and phases available as input. The program can catalog the newly built phases.

linkage stack

An area of protected storage that the system gives to a program to save status information for a branch and stack or a stacking program call.

link station

In SNA, the combination of hardware and software that allows a node to attach to and provide control for a link.

loader

A routine, commonly a computer program, that reads data or a program into processor storage. See also *relocating loader*.

local shared resources (LSR)

A VSE/VSAM option that is activated by three extra macros to share control blocks among files.

lock file

In a shared disk environment under VSE, a system file on disk that is used by the sharing systems to control their access to shared data.

logical partition

In LPAR mode, a subset of the server unit hardware that is defined to support the operation of a system control program.

logical record

A user record, normally pertaining to a single subject and processed by data management as a unit. Contrast with *physical* record, which may be larger or smaller.

logical unit (LU)

1. A name that is used in programming to represent an I/O device address. *physical unit (PU), system services control point (SSCP), primary logical unit (PLU), and secondary logical unit (SLU).*
2. In SNA, a port through which a user accesses the SNA network,
   a. To communicate with another user and
   b. To access the functions of the SSCP. An LU can support at least two sessions. One with an SSCP and one with another LU and might be capable of supporting many sessions with other LUs.

logical unit name

In programming, a name that is used to represent the address of an input/output unit.

logical unit 6.2

A SNA/SDLC protocol for communication between programs in a distributed processing environment. LU 6.2 is characterized by

1. A peer relationship between session partners,
2. Efficient utilization of a session for multiple transactions,
3. Comprehensive end-to-end error processing, and
4. A generic Application Programming Interface (API) consisting of structured verbs that are mapped into a product implementation.

logons interpret interpret routine

In VTAM, an installation exit routine, which is associated with an interpret table entry, that translates logon information. It also verifies the logon.

LPAR mode

Logically partitioned mode. The CP mode that is available on the Configuration (CONFIG) frame when the PR/SM feature is installed. LPAR mode allows the operator to allocate the hardware resources of the processor unit among several logical partitions.

M

macro definition

A set of statements and instructions that defines the name of, format of, and conditions for generating a sequence of assembler statements and machine instructions from a single source statement.

macro expansion

See *macro generation*

macro generation

An assembler operation by which a macro instruction gets replaced in the program by the statements of its definition. It takes place before assembly. Synonymous with *macro expansion*.

macro (instruction)

1. In assembler programming, a user-invented assembler statement that causes the assembler to process a set of statements that are defined previously in the macro definition.

2. A sequence of VSE/ICCF commands that are defined to cause a sequence of certain actions to be performed in response to one request.

maintain system history program (MSHP)

A program that is used for automating and controlling various installation, tailoring, and service activities for a VSE system.

main task

The main program within a partition in a multiprogramming environment.

master console

In z/VSE, one or more consoles that receive all system messages, except for those that are directed to one particular console. Contrast this with the *user* console, which receives only those messages that are specifically directed to it, for example messages that are issued from a job that was submitted with the request to echo its messages to that console. The operator of a master console can reply to all outstanding messages and enter all system commands.

maximum (max) CA

A unit of allocation equivalent to the maximum control area size on a count-key-data or fixed-block device. On a CKD device, the max CA is equal to one cylinder.

memory object

Chunk of virtual storage that is allocated above the bar (2 GB) to be created with the IARV64 macro.

message

In VSE, a communication that is sent from a program to the operator or user. It can appear on a console, a display terminal or on a printout.

MSHP

See maintain system history program.

multitasking

Concurrent running of one main task and one or several subtasks in the same partition.

MVS

Multiple Virtual Storage. Implies MVS/390, MVS/XA, MVS/ESA, and the MVS element of the z/OS (OS/390) operating system.

N

NetView

A z/VSE optional program that is used to monitor a network, manage it, and diagnose its problems.

network address

In SNA, an address, consisting of subarea and element fields, that identifies a link, link station, or NAU. Subarea nodes use network addresses; peripheral nodes use local addresses. The boundary function in the subarea node to which a peripheral node is attached transforms local addresses to network addresses and vice versa. See also *network name*.

network addressable unit (NAU)

In SNA, a logical unit, a physical unit, or a system services control point. It is the origin or the destination of information that is transmitted by the path control network. Each NAU has a network address that represents it to the path control network. See also *network name, network address*.

Network Control Program (NCP)

An IBM licensed program that provides communication controller support for single-domain, multiple-domain, and interconnected network capability. Its full name is ACF/NCP.

network definition table (NDT)

In VSE/POWER networking, the table where every node in the network is listed.

network name

1. In SNA, the symbolic identifier by which users refer to a NAU, link, or link station. See also *network address*.
2. In a multiple-domain network, the name of the APPL statement defining a VTAM application program. This is its network name, which must be unique across domains.

node

1. In SNA, an end point of a link or junction common to several links in a network. Nodes can be distributed to host processors, communication controllers, cluster controllers, or terminals. Nodes can vary in routing and other functional capabilities.
2. In VTAM, a point in a network that is defined by a symbolic name. Synonymous with *network node*. See *major node and minor node*.

node type

In SNA, a designation of a node according to the protocols it supports and the network addressable units (NAUs) it can contain.

O

object module (program)

A program unit that is the output of an assembler or compiler and is input to a linkage editor.

online application program

An interactive program that is used at display stations. When active, it waits for data. Once input arrives, it processes it and send a response to the display station or to another device.

operator command

A statement to a control program, issued via a console or terminal. It causes the control program to provide requested information, alter normal operations, initiate new operations, or end existing operations.

optional licensed program

An IBM licensed program that a user can install on VSE by way of available installation-assist support.

output parameter text block (OPTB)

in VSE/POWER's spool-access support, information that is contained in an output queue record if a * $$ LST or * $$ PUN statement includes any user-defined keywords that have been defined for autostart.

P

page data set (PDS)

One or more extents of disk storage in which pages are stored when they are not needed in processor storage.

page fixing

Marking a page so that it is held in processor storage until explicitly released. Until then, it cannot be paged out.

page I/O

Page-in and page-out operations.

page pool

The set of page frames available for paging virtual-mode programs.

panel

The complete set of information that is shown in a single display on terminal screen. Scrolling back and forth through panels like turning manual pages. See also *selection panel*.

partition balancing

A z/VSE facility that allows the user to specify that two or more or all partitions of the system should receive about the same amount of time on the processor.

PASN-AL (primary address space number - access list)

The access list that is associated with a partition. A program uses the PASN-AL associated with its partition and the DU-AL associated with its task (work unit). See also *DU-AL*.

Each partition has its own unique PASN-AL. All programs running in this partition can access data spaces through the PASN-AL. Thus a program can create a data space, add an entry for it in the PASN-AL, and obtain the ALET that indexes the entry. By passing the ALET to other programs in the partition, the program can share the data space with other programs running in the same partition.

PDS

Page data sets.

phase

The smallest complete unit of executable code that can be loaded into virtual storage.

physical record

The amount of data that is transferred to or from auxiliary storage. Synonymous with *block*.

PNET

Programming support available with VSE/POWER; it provides for the transmission of selected jobs, operator commands, messages, and program output between the nodes of a network.

POWER

See *VSE/POWER*.

pregenerated operating system

An operating system such as z/VSE that is shipped by IBM mainly in object code. IBM defines such key characteristics as the size of the main control program, the organization, and size of libraries, and required system areas on disk. The customer does not have to generate an operating system.

preventive service

The installation of one or more PTFs on a VSE system to avoid the occurrence of anticipated problems.

primary address space

In z/VSE, the address space where a partition is executed. A program in primary mode fetches data from the primary address space.

primary library

A VSE library owned and directly accessible by a certain terminal user.

printer/keyboard mode

Refers to 1050 or 3215 console mode (device dependent).

Print Services Facility (PSF)/VSE

An access method that provides support for the advanced function printers.

private area

The virtual space between the shared area (24 bit) and shared area (31 bit), where (private) partitions are allocated. Its maximum size can be defined during IPL. See also *shared area*.

private memory object

Memory object (chunk of virtual storage) that is allocated above the 2 GB line (bar) only accessible by the partition that created it.

private partition

Any of the system's partitions that are not defined as shared. See also *shared partition*.

production library

1. In a pre-generated operating system (or product), the program library that contains the object code for this system (or product).
2. A library that contains data that is needed for normal processing. Contrast with *test library*.

programmer logical unit

A logical unit available primarily for user-written programs. See also *logical unit name*.

program temporary fix (PTF)

A solution or by-pass of one or more problems that are documented in APARs. PTFs are distributed to IBM customers for preventive service to a current release of a program.

PSF/VSE

Print Services Facility/VSE.

PTF

See *Program temporary fix*.

Q

Queue Control Area (QCA)

In VSE/POWER, an area of the data file, which might contain:

- Extended checkpoint information
- Control information for a shared environment.

queue file

A direct-access file that is maintained by VSE/POWER that holds control information for the spooling of job input and job output.

R

random processing

The treatment of data without respect to its location on disk storage, and in an arbitrary sequence that is governed by the input against which it is to be processed.

real address area

In z/VSE, processor storage to be accessed with dynamic address translation (DAT) off

real address space

The address space whose addresses map one-to-one to the addresses in processor storage.

real mode

In VSE, a processing mode in which a program might not be paged. Contrast with *virtual mode*.

recovery management support (RMS)

System routines that gather information about hardware failures and that initiate a retry of an operation that failed because of processor, I/O device, or channel errors.

refresh release

An upgraded VSE system with the latest level of maintenance for a release.

relative-record file

A VSE/VSAM file whose records are loaded into fixed-length slots and accessed by the relative-record numbers of these slots.

release upgrade

Use of the FSU functions to install a new release of z/VSE.

relocatable module

A library member of the type object. It consists of one or more control sections cataloged as one member.

relocating loader

A function that modifies addresses of a phase, if necessary, and loads the phase for running into the partition that is selected by the user.

remote interface

In the context of z/VSE, the remote interface allows a client to make method calls to an EJB although the EJB is on a remote z/VSE host. The container uses the remote interface to create client-side stubs and server-side proxy objects to handle incoming method calls from a client to an EJB.

remote procedure call (RPC)

1. A facility that a client uses to request the execution of a procedure call from a server. This facility includes a library of procedures and an external data representation.
2. A client request to service provider in another node.

residency mode (RMODE)

A program attribute that refers to the location where a program is expected to reside in virtual storage. RMODE 24 indicates that the program must reside in the 24-bit addressable area (below 16 megabytes), RMODE ANY indicates that the program can reside anywhere in 31-bit addressable storage (above or below 16 megabytes).

REXX/VSE

A general-purpose programming language, which is particularly suitable for command procedures, rapid batch program development, prototyping, and personal utilities.

RMS

Recovery management support.

RPG II

A commercially oriented programming language that is specifically designed for writing application programs that are intended for business data processing.

S

SAM ESDS file

A SAM file that is managed in VSE/VSAM space, so it can be accessed by both SAM and VSE/VSAM macros.

SCP

System control programming.

SDL

System directory list.

search chain

The order in which chained sublibraries are searched for the retrieval of a certain library member of a specified type.

second-level directory

A table in the SVA containing the highest phase names that are found on the directory tracks of the system sublibrary.

Secure Sockets Layer (SSL)

A security protocol that allows the client to authenticate the server and all data and requests to be encrypted. SSL was developed by Netscape Communications Corp. and RSA Data Security, Inc..

segmentation

In VSE/POWER, a facility that breaks list or punch output of a program into segments so that printing or punching can start before this program has finished generating such output.

selection panel

A displayed list of items from which a user can make a selection. Synonymous with *menu*.

sense

Determine, on request or automatically, the status or the characteristics of a certain I/O or communication device.

sequential access method (SAM)

A data access method that writes to and reads from an I/O device record after record (or block after block). On request, the support performs device control operations such as line spacing or page ejects on a printer or skip some tape marks on a tape drive.

service node

Within the VSE unattended node support, a processor that is used to install and test a master VSE system, which is copied for distribution to the unattended nodes. Also, program fixes are first applied at the service node and then sent to the unattended nodes.

service program

A computer program that performs function in support of the system. See with *utility program*.

service refresh

A form of service containing the current version of all software. Also referred to as a *system refresh*.

service unit

One or more PTFs on disk or tape (cartridge).

shared area

In z/VSE, shared areas (24 bit) contain the Supervisor areas and SVA (24 bit) and shared areas (31 bit) the SVA (31 bit). Shared areas (24 bit) are at the beginning of the address space (below 16 MB), shared area (31 bit) at the end (below 2 GB).

shared disk option

An option that lets independent computer systems use common data on shared disk devices.

shared memory objects

Chunks of virtual storage allocated above the 2 GB line (bar), that can be shared among partitions.

shared partition

In z/VSE, a partition that is allocated for a program (VSE/POWER, for example) that provides services and communicates with programs in other partitions of the system's virtual address spaces. In most cases shared partitions are no longer required.

shared spooling

A function that permits the VSE/POWER account file, data file, and queue file to be shared among several computer systems with VSE/POWER.

shared virtual area (SVA)

In z/VSE, a high address area that contains a list system directory list (SDL) of frequently used phases, resident programs that are shared between partitions, and an area for system support.

SIT (System Initialization Table)

A table in CICS that contains data used the system initialization process. In particular, the SIT can identify (by suffix characters) the version of CICS system control programs and CICS tables that you have specified and that are to be loaded.

skeleton

A set of control statements, instructions, or both, that requires user-specific information to be inserted before it can be submitted for processing.

socksified

See *socks-enabled*.

Socks-enabled

Pertaining to TCP/IP software, or to a specific TCP/IP application, that understands the *socks protocol*. "Socksified" is a slang term for socks-enabled.

socks protocol

A protocol that enables an application in a secure network to communicate through a firewall via a *socks server*.

socks server

A circuit-level gateway that provides a secure one-way connection through a firewall to server applications in a nonsecure network.

source member

A library member containing source statements in any of the programming languages that are supported by VSE.

split

To double a specific unit of storage space (CI or CA) dynamically when the specified minimum of free space gets used up by new records.

spooling

The use of disk storage as buffer storage to reduce processing delays when transferring data between peripheral equipment and the processor of a computer. In z/VSE, this is done under the control of VSE/POWER.

Spool Access Protection

An optional feature of VSE/POWER that restricts individual spool file entry access to user IDs that have been authenticated by having performed a security logon.

spool file

1. A file that contains output data that is saved for later processing.
2. One of three VSE/POWER files on disk: queue file, data file, and account file.

SSL

See Secure Sockets Layer.

stacked tape

An IBM supplied product-shipment tape containing the code of several licensed programs.

standard label

A fixed-format record that identifies a volume of data such as a tape reel or a file that is part of a volume of data.

stand-alone program

A program that runs independently of (not controlled by) the VSE system.

startup

The process of performing IPL of the operating system and of getting all subsystems and applications programs ready for operation.

start option

In VTAM, a user-specified or IBM specified option that determines conditions for the time a VTAM system is operating. Start options can be predefined or specified when VTAM is started.

static partition

A partition, which is defined at IPL time and occupying a defined amount of virtual storage that remains constant. See also *dynamic partition*.

storage director

An independent component of a storage control unit; it performs all of the functions of a storage control unit and thus provides one access path to the disk devices that are attached to it. A storage control unit has two storage directors.

storage fragmentation

Inability to allocate unused sections (fragments) of storage in the real or virtual address range of virtual storage.

suballocated file

A VSE/VSAM file that occupies a portion of an already defined data space. The data space might contain other files. See also *unique file*.

sublibrary

In VSE, a subdivision of a library. Members can only be accessed in a sublibrary.

sublibrary directory

An index for the system to locate a member in the accessed sublibrary.

submit

A VSE/POWER function that passes a job to the system for processing.

SVA

See shared virtual area.

Synchronous DataLink Control (SDLC)

A discipline for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges might be duplex or half-duplex over switched or non-switched links. The configuration of the link connection might be point-to-point, multipoint, or loop.

SYSRES

See system residence volume.

system control programming (SCP)

IBM supplied, non-licensed program fundamental to the operation of a system or to its service or both.

system directory list (SDL)

A list containing directory entries of frequently used phases and of all phases resident in the SVA. The list resides in the SVA.

system file

In z/VSE, a file that is used by the operating system, for example, the hardcopy file, the recorder file, the page data set.

System Initialization Table (SIT)

A table in CICS that contains data that is used by the system initialization process. In particular, the SIT can identify (by suffix characters) the version of CICS system control programs and CICS tables that you have specified and that are to be loaded.

system recorder file

The file that is used to record hardware reliability data. Synonymous with *recorder file*.

system refresh

See *service refresh*.

system refresh release

See *refresh release*.

system residence file (SYSRES)

The z/VSE system sublibrary IJSYSRS.SYSLIB that contains the operating system. It is stored on the system residence volume DORSES.

system residence volume (SYSRES)

The disk volume on which the system sublibrary is stored and from which the hardware retrieves the initial program load routine for system startup.

system sublibrary

The sublibrary that contains the operating system. It is stored on the system residence volume (SYSRES).

T

task management

The functions of a control program that control the use, by tasks, of the processor and other resources (except for input/output devices).

time event scheduling support

In VSE/POWER, the time event scheduling support offers the possibility to schedule jobs for processing in a partition at a predefined time once repetitively. The time event scheduling operands of the * $$ JOB statement are used to specify the wanted scheduling time.

TLS

See Transport Layer Security.

track group

In VSE/POWER, the basic organizational unit of a file for CKD devices.

track hold

A function that protects a track that is being updated by one program from being accessed by another program.

transaction

1. In a batch or remote batch entry, a job or job step. 2. In CICS TS, one or more application programs that can be used by a display station operator. A given transaction can be used concurrently from one or more display stations. The execution of a transaction for a certain operator is also referred to as a task.
2. A given task can relate only to one operator.

transient area

An area within the control program that is used to provide high-priority system services on demand.

Transport Layer Security

The newest SSL cryptographic protocol. It provides additional strength to privacy and data integrity.

Turbo Dispatcher

A facility of z/VSE that allows to use multiprocessor systems (also called CEC: Central Electronic Complexes). Each CPU within such a CEC has accesses to be shared virtual areas of z/VSE: supervisor, shared areas (24 bit), and shared areas (31 bit). The CPUs have equal rights, which means that any CPU might receive interrupts and work units are not dedicated to any specific CPU.

U

UCB

Universal character set buffer.

universal character set buffer (UCB)

A buffer to hold UCS information.

UCS

Universal character set.

user console

In z/VSE, a console that receives only those system messages that are specifically directed to it. These are, for example, messages that are issued from a job that was submitted with the request to echo its messages to that console. Contrast with *master console*.

user exit

A programming service that is provided by an IBM software product that can be requested during the execution of an application program for the service of transferring control back to the application program upon the later occurrence of a user-specified event.

V

variable-length relative-record data set (VRDS)

A relative-record data set with variable-length records. See also *relative-record data set*.

variable-length relative-record file

A VSE/VSAM relative-record file with variable-length records. See also *relative-record file*.

VIO

See virtual I/O area.

virtual address

An address that refers to a location in virtual storage. It is translated by the system to a processor storage address when the information stored at the virtual address is to be used.

virtual addressability extension (VAE)

A storage management support that allows to use multiple virtual address spaces.

virtual address space

A subdivision of the virtual address area (virtual storage) available to the user for the allocation of private, nonshared partitions.

virtual disk

A range of up to 2 gigabytes of contiguous virtual storage addresses that a program can use as workspace. Although the virtual disk exists in storage, it appears as a real FBA disk device to the user program. All I/O operations that are directed to a virtual disk are intercepted and the data to be written to, or read from, the disk is moved to or from a data space.

Like a data space, a virtual disk can hold only user data; it does not contain shared areas, system data, or programs. Unlike an address space or a data space, data is not directly addressable on a virtual disk. To manipulate data on a virtual disk, the program must perform I/O operations.

Starting with z/VSE 5.2, a virtual disk may be defined in a shared memory object.

virtual I/O area (VIO)

An extension of the page data set; used by the system as intermediate storage, primarily for control data.

virtual mode

The operating mode of a program, where the virtual storage of the program can be paged, if not enough processor (real) storage is available to back the virtual storage.

virtual partition

In VSE, a division of the dynamic area of virtual storage.

virtual storage

Addressable space image for the user from which instructions and data are mapped into processor storage locations.

virtual tape

In z/VSE, a virtual tape is a file (or data set) containing a tape image. You can read from or write to a virtual tape in the same way as if it were a physical tape. A virtual tape can be:

- A VSE/VSAM ESDS file on the z/VSE local system.
- A remote file on the server side; for example, a Linux, UNIX, or Windows file. To access such a remote virtual tape, a TCP/IP connection is required between z/VSE and the remote system.

volume ID

The volume serial number, which is a number in a volume label that is assigned when a volume is prepared for use by the system.

VRDS

Variable-length relative-record data sets. See *variable-length relative record file*.

VSAM

See *VSE/VSAM*.

VSE (Virtual Storage Extended)

A system that consists of a basic operating system and any IBM supplied and user-written programs that are required to meet the data processing needs of a user. VSE and hardware it controls form a complete computing system. Its current version is called z/VSE.

VSE/Advanced Functions

A program that provides basic system control and includes the supervisor and system programs such as the Librarian and the Linkage Editor.

VSE Connector Server

Is the host part of the VSE JavaBeans, and is started using the job STARTVCS, which is placed in the reader queue during installation of z/VSE. Runs by default in dynamic class R.

VSE/DITTO (VSE/Data Interfile Transfer, Testing, and Operations Utility)

An IBM licensed program that provides file-to-file services for disk, tape, and card devices.

VSE/ESA (Virtual Storage Extended/Enterprise Systems Architecture)

The predecessor system of z/VSE.

VSE/Fast Copy

A utility program for fast copy data operations from disk to disk and dump/restore operations via an intermediate dump file on magnetic tape or disk.

VSE/FCOPY (VSE/Fast Copy Data Set program)

An IBM licensed program for fast copy data operations from disk to disk and dump/restore operations via an intermediate dump file on magnetic tape or disk. There is also a stand-alone version: the FASTCOPY utility.

VSE/ICCF (VSE/Interactive Computing and Control Facility)

An IBM licensed program that serves as interface, on a time-slice basis, to authorized users of terminals that are linked to the system's processor.

VSE/ICCF library

A file that is composed of smaller files (libraries) including system and user data, which can be accessed under the control of VSE/ICCF.

VSE JavaBeans

Are JavaBeans that allow access to all VSE-based file systems (VSE/VSAM, Librarian, and VSE/ICCF), submit jobs, and access the z/VSE operator console. The class library is contained in the *VSEConnector.jar* archive. See also *JavaBeans*.

VSE library

A collection of programs in various forms and storage dumps stored on disk. The form of a program is indicated by its member type such as source code, object module, phase, or procedure. A VSE library consists of at least one sublibrary, which can contain any type of member.

VSE/POWER

An IBM licensed program that is primarily used to spool input and output. The program's networking functions enable a VSE system to exchange files with or run jobs on another remote processor.

VSE/VSAM (VSE/Virtual Storage Access Method)

An IBM access method for direct or sequential processing of fixed and variable length records on disk devices.

VSE/VSAM catalog

A file containing extensive file and volume information that VSE/VSAM requires to locate files, to allocate and deallocate storage space, to verify the authorization of a program or an operator to gain access to a file, and to accumulate use statistics for files.

VSE/VSAM managed space

A user-defined space on disk that is placed under the control of VSE/VSAM.

W

wait for run subqueue

In VSE/POWER, a subqueue of the reader queue with dispatchable jobs ordered in execution start time sequence.

wait state

The condition of a processor when all operations are suspended. System recovery from a hard wait is impossible without performing a new system startup. See *hard wait*.

Workstation File Transfer Support

Enables the exchange of data between IBM Personal Computers (PCs) linked to a z/VSE host system where the data is kept in intermediate storage. PC users can retrieve that data and work with it independently of z/VSE.

work file

A file that is used for temporary storage of data being processed.

Numerics

24-bit addressing

Provides addressability for address spaces up to 16 megabytes.

31-bit addressing

Provides addressability for address spaces up to 2 gigabytes.

64-bit addressing

Provides addressability for address spaces up to 2 gigabytes and above.

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