

IBM z/VSE



# Release Guide

*Version 4 Release 3*



IBM z/VSE



# Release Guide

*Version 4 Release 3*

**Note!**

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

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 SC33-8300-04.

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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

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## 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.

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## z/VSE Information

z/VSE information is accessible using screen readers with the BookServer/Library Server versions of z/VSE books in the Internet library at:

<http://www.ibm.com/systems/z/os/zos/bkserv/vse.html>

One exception is command syntax that is published in railroad track format. If required, screen-readable copies of z/VSE books with that syntax information are separately available in HTML zipped file form upon request to [s390id@de.ibm.com](mailto:s390id@de.ibm.com).



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## About This Book

This manual provides details of the enhancements and changes implemented with IBM® z/VSE Version 4 Release 3 (z/VSE 4.3).

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## Who Should Use This Book

This manual is intended for those z/VSE users who need to be aware of important information provided with z/VSE 4.3.

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## How to Use This Book

The book contains one chapter:

- “What Is New With z/VSE 4.3?” on page 1

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## Where to Find More Information

Whenever appropriate, the book refers to other z/VSE manuals that provide further details on a specific topic.

The z/VSE home page provides additional z/VSE information:

### **z/VSE Home Page**

z/VSE has a home page on the World Wide Web, which offers up-to-date information about VSE-related products and services, new z/VSE functions, and other items of interest to VSE users.

You can find the z/VSE home page at

<http://www.ibm.com/systems/z/os/zvse/>

You can also find VSE User Examples (in zipped format) at

<http://www.ibm.com/systems/z/os/zvse/downloads/samples.html>



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## What Is New With z/VSE 4.3?

z/VSE 4.3 aims to continue the strategy that was defined for previous releases. This means:

- **Protect** customers' investments in the z/VSE platform,
- **Integrate** z/VSE into the overall IT environment, and
- **Extend** existing z/VSE application solutions by exploiting and leveraging *Linux on System z* (or any other application platform).

Linux on System z is central to z/VSE's strategy of enabling open standard e-business technologies to support new, more rapidly growing workloads. The *Linux Fast Path* (described in this chapter) has now been provided to help meet this strategy.

Using the *z/VSE connectors*, you can also integrate z/VSE resources with any Java-capable platform of your choice (that is, not only System z).

This chapter provides a brief description of the items and changes introduced with z/VSE 4.3.

It contains these main topics:

- "Support for IBM System z Servers and Features" on page 2
  - "Servers Supported by z/VSE 4.3" on page 2
  - "Support for the Linux Fast Path" on page 2
  - "Support for the Queue-I/O Assist Function" on page 3
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## Support for IBM System z Servers and Features

z/VSE 4.3 is designed to support the latest IBM System z servers and features. It offers the value of innovative IBM zEnterprise™ 196 and System z10™ technology.

### Servers Supported by z/VSE 4.3

z/VSE 4.3 supports these **IBM System z** servers:

- **IBM zEnterprise 196** (z196).
- **IBM System z10 Enterprise Class** (z10 EC).
- **IBM System z10 Business Class** (z10 BC).
- **IBM System z9® Enterprise Class** (z9 EC).
- **IBM System z9 Business Class** (z9 BC).
- **IBM eServer™<sup>1</sup> zSeries®** servers:
  - **zSeries 890** (z890)
  - **zSeries 990** (z990)
  - **zSeries 800** (z800)
  - **zSeries 900** (z900)

For further details, see “Hardware Support” in the *z/VSE Planning*, SC33-8301.

### Support for the Linux Fast Path

The Linux Fast Path exploits the *z/VM-mode LPAR* available with IBM System z10 and zEnterprise 196. The *z/VM-mode LPAR* means:

- You can install z/VSE and Linux on System z in z/VM guests that are defined in the *same LPAR*.
- Within the same LPAR, Linux on System z will primarily run on the faster/cheaper IFL (Integrated Linux Facility) processors, whereas z/VSE will run on standard processors.

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1. The IBM eServer brand consists of the established IBM e-business logo with the descriptive term "server" following it.

#### Notes:

1. It is *not* a technical requirement that you run the Linux Fast Path in a z/VM-mode LPAR.
2. If you do not run the Linux Fast Path in a z/VM-mode LPAR, Linux on System z will run on a standard CP. This might result in higher software costs.

For further details, see “Running z/VSE With a Linux Fast Path” in the *z/VSE Planning*, SC33-8301.

## Support for the Queue-I/O Assist Function

The z/VM function *queue-I/O assist* (QIOASSIST) provides performance improvements for V=V guests using real adapters and real networking devices that use the Queued Direct I/O (QDIO) facility.

z/VSE exploits the queue-I/O assist function for:

- OSA Express devices (CHPID type **OSD**).
- HyperSockets™ devices (CHPID type **IQD**).

After you have enabled the queue-I/O assist function, each `DEFINE LINK,TYPE=OSAX` command will *automatically* exploit the queue-I/O assist function.

For further details, see “Exploiting the Queue-I/O Assist Function” in the *z/VSE Planning*, SC33-8301.

## Dynamic Starting/Stopping of CPUs

CPUs that were not online at IPL can be started "dynamically". These can be CPUs that were:

- in a “standby” state at IPL.
- added to the z/VSE LPAR profile after IPL.

Using the HMC/SE “Logical Processor Add” task, you can add CPUs to the LPAR after IPL. This feature is available with IBM System z10 and zEnterprise 196.

In addition, CPUs that are online can be stopped "dynamically".

For details of how to use the `SYSDEF TD` command to dynamically start/stop CPUs, refer to the *z/VSE System Control Statements*, SC33-8305.

## Support for 1 MB Frames for Dataspaces

The 1 MB frame support (also referred to as “large page support” or “1 MB page support”) allows 1 MB of virtual storage to be backed with 1 MB frames in processor storage. This means, the virtual storage can be viewed as being “fixed” because paging does not occur. The 1 MB frame support is available:

- with IBM System z10 and zEnterprise 196.
- in LPAR mode only.

z/VSE now uses 1 MB frame support for *data spaces*. Long-running applications accessing data spaces frequently might benefit from improved CPU utilization. 1 MB frame support for data spaces might help you to exploit large processor storage to a greater extent. z/VSE implements this support *transparently*:

- In order to take advantage of z/VSE's 1 MB frame support, you are *not* required to perform any actions.

- z/VSE decides internally when and how data spaces will be backed with 1 MB frames. Therefore, a data space can consist of both “fixed” and “pageable” virtual storage.
- If the z/VSE system runs out of processor storage, one or more 1 MB frames used for backing data spaces will be made available again for use by the system. This is true for the time during which the data space application is active. To avoid this occurring in the future, you can increase the amount of processor storage before the next re-IPL of your z/VSE system.

Data space support in z/VSE is enabled via the SYSDEF DSPACE command. The default size of a data space (DFSIZE) is 960 KB. All data spaces that you define with a maximum size of *at least 960 KB* will benefit from 1 MB frame support providing sufficient processor storage is currently available.

The use of 1 MB frames for data spaces is displayed via the QUERY DSPACE and MAP REAL commands.

For further details about these commands, refer to the *z/VSE System Control Statements*, SC33-8305.

## Static Power Save Mode - SYSEVENT QVS

To facilitate energy savings, the *static power save mode* on IBM zEnterprise 196 servers allows you to reduce the power consumption of the zEnterprise 196 during runtime when full performance is not required.

The SYSEVENT QVS macro has been modified to match the corresponding z/OS changes in support of static power save mode. The format number of the output has been incremented to 2 and a new byte is defined to indicate the current status of capacity on the machine (nominal or reduced).

## Support for the Crypto Express3 Card

z/VSE supports the Crypto Express3 card (a secure coprocessor) in both coprocessor and accelerator modes.

The Crypto Express3 card is available with IBM System z10 and zEnterprise 196. This Crypto Express3 generation of cryptographic cards will provide faster SSL acceleration.

The Crypto Express3 card is recognized during the startup of the Security Server partition (default FB) in the same way as other supported cards.

### Notes:

1. z/VSE uses the Crypto Express3 card with the *same functionality* as Crypto Express2. New functions and key lengths are *not* exploited.
2. Crypto Express3 support is also available with z/VSE 4.2 and PTF(s).

## Support for the FICON Express8 Adapter

The FICON<sup>®</sup> Express8 adapter supports a link rate of 8 Gigabits per second (Gbps), and will auto-negotiate 2 or 4 Gbps.

FICON Express8 offer two modes of operation:

- Native FICON and FICON Channel-to-Channel (CTC) traffic (CHPID type **FC**).
- Fibre Channel Protocol traffic (CHPID type **FCP**) for access to SCSI disks.



The FICON Express8 features are exclusive to IBM System z10 and zEnterprise 196. The exploitation of FICON Express8 is transparent to applications. FICON Express8 (in both modes) is supported by *z/VSE 4.1 and later*.

## Support for Device Addresses up to X'FFFF'

*z/VSE* now supports device addresses (that is, *physical addresses*) of up to X'FFFF'. This support is implemented as follows:

- *z/VSE* applications, messages, commands, and so on, do not address a device by the *physical address* (**pcuu**), but instead by the *VSE address* (**cuu**).
- VSE addresses are in the range from X'000' to X'FFF'.
- To each physical address (pcuu) there is a corresponding VSE address (cuu).
- If the physical address is less than or equal to X'FFF', the VSE address (cuu) is equal to the physical address (pcuu).
- If the physical address is higher than X'FFF' (and therefore outside the range of VSE addresses), the physical address (pcuu) and VSE address (cuu) will be different.

CP commands (under *z/VM*<sup>®</sup>) always use *physical addresses*.

*z/VSE* jobs, commands, dialogs, and messages use *VSE addresses*. However, in specified cases (for example, when using the QUERY IO command) *physical addresses* might be used.

The QUERY IO command has also been enhanced so you can obtain the VSE address of a device that corresponds to a physical address . You can similarly use the QUERY IO command to obtain the physical address of a device that corresponds to a VSE address.

Because *z/VSE* supports physical addresses of up to X'FFFF', personnel in the computing center must no longer provide a *z/VSE*-specific configuration. This is especially helpful in mixed IT environments where *z/VSE* is used together with one or more of the following operating systems:

- *z/VM*
- Linux on System z
- *z/OS*.

For further details about using extended physical device address support (including the use of the QUERY IO command), see “Device Address Support Of Up to X'FFFF'” in the *z/VSE Planning*, SC33-8301.

## Option to Allocate I/O Control-Blocks Above 16 MB Line

The IODEV parameter in the *Tailor IPL Procedure: Supervisor Parameters* dialog specifies the number of Input/Output (I/O) devices the z/VSE supervisor will support. The IODEV parameter also determines the shared addressing area in which various I/O control blocks will be allocated by the z/VSE supervisor.

To remove a constraint that previously existed in z/VSE performance, you can now instruct the z/VSE supervisor to allocate various Input/Output (I/O) control blocks in the *31-bit* shared area (below the 2 GB line) instead of in the previous *24-bit* shared area (below the 16 MB line). This makes space available in the 24-bit shared area for other uses, and might improve z/VSE I/O performance.

For further details, see “Allocating I/O Control Blocks Above 16 MB Line” in the *z/VSE Planning*, SC33-8301.

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## Exploitation of IBM System Storage DS8000 Series Technology

### IBM DS8000 Full Disk Encryption

Full Disk Encryption provides the ability to encrypt data “at rest” on an IBM System Storage<sup>®</sup> DS8000<sup>®</sup> series storage controller. The Full Disk Encryption disk drive sets are optional for the DS8000 series.

IBM DS8000 Disk Encryption is *transparent* to applications.

You can use the AR (Attention Routine) VOLUME command to identify *Full Disk Encryption* disk drives. If the display from this command shows an \*E or EB in the CODE column, this indicates that this is a Full Disk Encryption disk drive. This command is also available with z/VSE 4.2 and PTF(s).

For details, see “Job Control and Attention Routine” in the *z/VSE System Control Statements*, SC33-8305.

**Note:** DS8000 Disk Encryption is also available with z/VSE 4.1 and later.

### IBM DS8000 Solid State Disk (SSD) Support

z/VSE provides SSD (Solid<sup>®</sup> State Disk) support which is transparent to z/VSE applications.

For performance considerations, refer to the IBM System Storage Homepage:  
<http://www.ibm.com/systems/storage/disk/ds8000/index.html>

**Note:** SSD support is also available with z/VSE 4.1 and later.

### Indication of Whether a Volume is Space-Efficient

*IBM FlashCopy<sup>®</sup> SE* (Space Efficient) is an optional licensed hardware feature on the IBM System Storage DS8000 series.

You can use the AR (Attention Routine) command VOLUME cuu to identify Space Efficient volumes. If a volume is a Space Efficient volume, SE (Space Efficient) is included in the STATUS column of the resulting display.

For further details, see “Job Control and Attention Routine” in the *z/VSE System Control Statements*, SC33-8305.

**Note:** FlashCopy SE support is also available with z/VSE 4.2 and PTF(s).

## Support for FlashCopy Consistency Groups

Using the FlashCopy *Consistency Group* support, you can take a FlashCopy across *multiple volumes* of the IBM System Storage DS8000 series. This is useful when applications have their data spread over multiple volumes.

Consistency groups help create a consistent Point-in-Time copy across multiple volumes, thus managing the consistency of *dependent writes*.

To ensure that order of dependent writes to the FlashCopy source volume is consistent with the data on the target volume, you can use the FlashCopy FREEZE and THAW parameters.

For details of how Consistency Groups are used, see “Performing a FlashCopy” in the *z/VSE Administration*, SC33-8304.

## FCOPY Options NOCOPY and DDSR to Establish/Remove a NOCOPY Relationship

The *Copy a Volume* dialog (from Administrator Fast Path 377) now offers the:

- **NOCOPY** option to establish a NOCOPY relationship.
- **DDSR** option to remove a previously-established NOCOPY relationship.

The *Copy Disk to Disk* dialog (Fast Path 3771) that uses FCOPY has been extended to include the NOCOPY option.

A new dialog *Remove FlashCopy Relation* (Fast Path 3773) implements the DDSR function to remove a previously-established NOCOPY relationship.

For details of the DDSR option, see “Copying a Volume or Specific Files” in the *z/VSE Administration*, SC33-8304.

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## Exploitation of IBM System Storage Tape Technology

**Note!**

For details of all the tape devices described below, see “Tape Device Support” in the *z/VSE Planning*, SC33-8301.

### Support for the IBM TS7700 Virtualization Engine Release 1.7

The IBM TS7700 Virtualization Engine Release 1.7 supports these capabilities:

- IBM TS7720 Virtualization Engine disk-only configuration, with new disk cache models that provide up to **70 TB** disk cache capacity.
- Larger disk cache models that provide over **13 TB** capacity for new TS7740 configurations.
- Integrated library manager.
- New Grid adapters.
- TS1130 Model E06 Tape Drive.

**Note:** TS7700 Virtualization Engine support is available from z/VSE 4.1 and later.

### WORM Support for the IBM TS7700 Virtualization Engine

WORM cartridges are designed to provide non-alterable, non-rewritable tape media for long-term records retention.

- When the tape drive detects a WORM cartridge, the tape drive prevents overwrite or changes to existing customer data.
- New data can be appended to existing data until the capacity of the cartridge is reached.

The TS7700 Virtualization Engine provides support for WORM cartridges via its logical tape volumes (3490E). This support is available with the TS7700 Release 1.6 and later.

### Support for the IBM TS7720 Virtualization Engine

The IBM TS7720 Virtualization Engine is a new member of the TS7700 Virtualization Engine family that is:

- a *disk-cache only* configuration (it does *not* attach to a “physical” tape library),
- configured with different server and disk cache models than the TS7740.

To support the use of the TS7720, z/VSE provides this additional information:

- Using the QT cuu command, you can see if a member of the TS7700 family is a disk-only (tapeless) TS7720 Virtualization Engine. The parameter DISK-ONLY is displayed together with the other details.
- The JCL LIBSERV LQUERY command and the LBSERV LQUERY macro call can be used to obtain information about the percentage of cache that is currently being used.

**Note:** TS7720 Virtualization Engine support is also available with z/VSE 4.2 and PTF(s).

## Support for the IBM TS7680 ProtecTIER Deduplication Gateway for System z

The IBM TS7680 ProtecTIER® Deduplication Gateway for System z (referred to simply as the TS7680) provides users with an optimal disk-based solution for System z applications that traditionally use tape, and is designed to simplify tape processing operations.

Like the IBM System Storage TS7720 Virtualization Engine, the TS7680 provides a *disk-only virtual tape solution*. It does this by emulating an IBM tape library and 3592 Model J1A tape drives.

The TS7680 therefore offers:

- High performance inline deduplication.
- Scalability up to 1 PB of useable capacity per system.
- 256 virtual tape drives per two-node cluster.
- Up to one million logical volumes per system.
- Multiple disk configuration options.
- Simplified deployment.

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## Security Enhancements

### BSM Security Enhancements

These are the main enhancements in the areas of BSM (Basic Security Manager) security.

- The dialogs for adding or changing a user profile have been modified so that z/VSE automatically links to LDAP-related panels. For details, see “Maintaining User Profiles via Dialogs” in the *z/VSE Administration*, SC33-8304.
- You can now generate BSM Cross Reference reports. When deleting a user-ID, these reports help administrators identify and delete the related profile definitions in the BSM control file (BSTCNTL). For details, see “Generating BSM Cross Reference Reports” in the *z/VSE Administration*, SC33-8304.
- The BSM now supports resource classes for use with the *WebSphere MQ for z/VSE*. For details, see “WebSphere MQ for z/VSE Resource Classes” in the *z/VSE Administration*, SC33-8304.
- Dialog enhancement have been made that simplify the connecting of a user-ID to one or more user groups, as well as removing the connections of a user-ID to one or more user groups. For example, for a specific user-ID you can remove *all* connections from this user-ID to user groups via *one PF key*. For details, see “Connecting a User to Groups via Option 8” and “Removing User Connects to Groups via Option 9” in the *z/VSE Administration*, SC33-8304.
- You can now use five resource profiles (for the FACILITY resource class) to protect operands contained in JCL statements. For details, see “Using BSM Dialogs to Protect JCL Operands” in the *z/VSE Administration*, SC33-8304.
- You can now use SMF (System Management Facility) records together with the DMF (Data Management Facility) to log access attempts to resources protected by DTSECTAB. For details, see “Using SMF/DMF to Log Access Attempts to DTSECTAB Resources” in the *z/VSE Administration*, SC33-8304.

## LDAP Enhancements

The previous restriction, that z/VSE did not support the use of an LDAP long-user-ID and long password in the ID statement of batch jobs, has now been removed.

To use an LDAP sign-on in a *batch job*, you can now include a statement in your batch job containing the USER and PWD parameters. These parameters specify either the:

- Long LDAP user-ID and password (if the user is LDAP-enabled).
- Short VSE user-ID and password (if the user is not LDAP-enabled).

In addition, a dialog has been provided that simplifies the maintenance of LDAP user-IDs in the LDAP mapping file.

For further details, see “Maintaining User Profiles in an LDAP Environment” in the *z/VSE Administration*, SC33-8304.

## New Commands to Manage Hardware Cryptography

You can use the *APEAI command* to enable AP (Adjunct Processor)-queue interrupts. The AP-queue adapter-interruption facility is a new function of IBM z10 and zEnterprise 196. However, this facility is only available when running *in an LPAR* (that is, not when running under z/VM).

When performing cryptographic operations on Crypto Express2 and Crypto Express3 cards, the calling program is notified via a hardware interrupt when a response is ready for de-queueing from a card. When the APEAI command is executed, AP-queue interrupts will be enabled for *all* APs assigned to the current LPAR,

You can use the *APDAI command* to disable AP-queue interrupts for *all* APs assigned to the current LPAR.

For details, see “Using Hardware Crypto Commands” in the *z/VSE Administration*, SC33-8304.

---

## Other Enhancements to z/VSE Base Programs

### e-business Connectors Enhancements

These are the main enhancements provided with z/VSE 4.3:

- The current versions of these products are supported:
  - Windows (for example, Windows Vista) together with the related security concepts.
  - Java, together with the related SSL functionality.
  - TCP/IP.
  - WebSphere®.
- These are the enhancements to the *VSAM Redirector Connector*:
  - You can activate the *VSAM Redirector trace* via the *VSAM SNAP dump trace*.
  - Enhanced support is provided for *CICS® subtasking* used together with the VSAM Redirector.
- The *Java-Based Connector* now supports *implied decimal positions* with decimal data types such as PACKED and ZONED.
- The *WebSphere MQ for z/VSE* has replaced the MQSeries® for VSE/ESA. This change mainly affects the chapter “Installing the VSAM Redirector Connector” in the *z/VSE e-business Connectors User’s Guide*, SC33-8310.
- Information has been provided that describes how you can use the Encryption Facility for z/VSE to encrypt/decrypt *record-based data*. For details, refer to the chapter “Implementing the Encryption Facility for z/VSE” in the *z/VSE e-business Connectors User’s Guide*, SC33-8310.

### System Monitoring Via the VSE Monitoring Agent

IBM has developed an *application framework*, which is based upon common standards such as TCP/IP and SNMP, to enable you to monitor your z/VSE systems using *standard monitoring interfaces*. This application framework includes an *open interface*, which enables you to use your own programs to collect other data.

It is important to monitor your z/VSE systems since core applications (CICS, COBOL, VSAM, and so on) running on the z/VSE host are usually critical to the company’s operations. In addition, these core applications usually represent an enormous investment of past resources.

The application framework consists of *three* logical layers:

- A *client*, which can be a workstation, server, wireless telephone, or Personal Digital Assistant (PDA) where monitoring software installed.
- The *VSE Monitoring Agent*, which lies at the center of the application framework and which:
  - processes requests from clients
  - controls access to business logic and data.
- *Plug-ins*, which provide access to:
  - z/VSE data
  - other data via your own programs.

z/VSE therefore provides:

- The VSE Monitoring Agent, which is a batch application running in a z/VSE (static or dynamic) partition and which responds to all SNMP Version 1 requests.
- An SNMP trap client, which can be used for monitoring purposes by sending SNMP Version 1 “traps” to SNMP monitors.



For further details about the VSE Monitoring Agent, see “Collecting Data Using the VSE Monitoring Agent” in the *z/VSE e-business Connectors User’s Guide*, SC33-8310,

## CICS Performance Enhancements

The area of z/VSE 24-bit storage that is located *below* the 16 Megabyte line represents a limited resource. For customers that have heavy and growing CICS workloads, this limited resource might be a constraint on CICS performance.

Therefore, to improve CICS performance these members have been moved from 24-bit storage into 31-bit storage:

- system code and buffers
- a part of the Input/Output control blocks
- VSAM buffers and phases.

These enhancements should also benefit customers who wish to consolidate their z/VSE systems.

Another enhancement that affects CICS performance relates to the use of 1 MB frames for dataspace. See “Support for 1 MB Frames for Dataspace” on page 3.

## VSE/POWER Enhancements

The following is a summary of the enhancements provided by VSE/POWER 8.3:

- To prevent “looping” jobs from exhausting the VSE/POWER data file, these jobs can be cancelled automatically when their output reaches a specified limit. The defined limit can be applied to LST and PUT spooling to both disk and tape. The limit is defined using the new JECL parameter RBF (Records Before Flush). For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.
- When a TCP/IP connection between two nodes is to be established, a passive TCP/IP connection must be active on at least one of these nodes. If severe errors occur for this passive connection, the passive TCP/IP connection is stopped and the following message is issued:

```
1RTYI TCP/IP: NEW CONNECTION REQUESTS FROM REMOTE NODES CAN NO LONGER BE PROCESSED
```

Using the command `PSTART TCPIP,PASSIVE`, you can now restart the passive TCP/IP connection *without* stopping and restarting all TCP/IP connections and the TCP/IP interface itself. For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.

- The PDISPLAY command (formats 1 and 2) now supports the CQNUM operand. You can use this operand to address a queue entry by its internal queue number. For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.
- A fixed-format output-generation message is now available, together with the existing job completion and generation messages. In order to meet the increased number of potentially-issued fixed format messages, the default queue size of fixed format message has been increased from 20 to 50, and its maximal value - from 99 to 255. To reflect these changes, the JCMQ operand (JCMQ=*nnn*) of the SET autostart statement now supports three positions instead of two. For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.
- Previously, the CSYSID operand could only address queue entries belonging to a *specific* system. Now, using the CSYSID=N you can address *all* queue entries which do not belong to a specific system. CSYSID=N is available for PDISPLAY and all queue-manipulation commands. For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.



- The PDISPLAY command (format 8) now supports the TIME operand. You can use this operand to display the start date and time of a job or jobs running in a specified partition or partitions. For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.
- A new format 3 of the \* \$\$ PUN JECL statement allows you to redirect punch output to a VSE/AF library member. For details, refer to the *VSE/POWER Administration and Operation*, SC33-8314.
- Previously, VSE/POWER did not provide SAS (Spool Access Support) applications with notifications of job outputs (as it does for job-generation and job-completion events). Now, VSE/POWER issues the fixed-format message 1Q5RI to notify SAS applications of output-generation events. For details, refer to the *VSE/POWER Application Programming*, SC34-2601.
- Previously, using the selection criteria of SAS GCM you could retrieve all event messages, all messages from jobs with a specific job name, and all messages from job with a specific job name and job number. Now, you can *additionally* retrieve all messages of specific types (JCM, JGM or OGM), all messages of specific types from jobs with a specific job name, and all messages of specific types from jobs with a specific job name and job number. For details, refer to the *VSE/POWER Application Programming*, SC34-2601.

## VSE/VSAM Enhancements

These are the main enhancements introduced with VSE/VSAM 8.3:

- Three new parameters have been implemented for the RECMAP command:
  - CLUSTER NAMES, which is used to list all map names and related cluster names that belong to a specified catalog, sorted by cluster names.
  - MAP NAMES, which is used to list all map names that belong to a specified catalog, sorted by map names.
  - DECIMAL POS, which is used to specify the position of the decimal point for decimal numbers.

For details, refer to the *VSE/VSAM Commands*, SC33-8315.

- Virtual storage constraint-relief enhancements:
  - VSE/VSAM modules have been relocated from the 24-bit to 31-bit SVA storage area.
  - VSE/VSAM internal control blocks have been moved from 24-bit to 31-bit partition GETVIS.
  - VSE/VSAM storage is now acquired from GETVIS sub-pools, therefore allowing real-time monitoring of GETVIS usage.
  - User-generated VSE/VSAM control blocks (RPL, ACB, EXLST), as well as action macros, can now be located-in / executed-from 31-bit partition GETVIS.

For details, refer to the *VSE/VSAM User's Guide and Application Programming*, SC33-8316.

- DLBL statement enhancements:
  - You can now specify allocated space in blocks and cylinders for VSE/VSAM Managed-SAM clusters.
  - You can now use the BUFDAT=RMODE31 parameter to allocate buffers in 31-bit partition GETVIS, without the need to recompile legacy applications.

For details, refer to the *VSE/VSAM User's Guide and Application Programming*, SC33-8316.

- SHOWCB enhancements:
  - The SHOWCB macro supports the following set of new fields/attributes for the ACB macro: ATRB, BLREC, NCIS, NSLOT, SSRBA, SHAREOP, and SYMU.

- Local versions (for the current work session) of most statistics are also available.
- You can use two new fields (ASTRNUM and STRTOT) to monitor VSAM LSR datasets.

For details, refer to the *VSE/VSAM User's Guide and Application Programming*, SC33-8316.

- The VSAM Redirector Connector running under CICS will now be invoked in a separate z/VSE subtask. It supports VSE/VSAM EXCPAD, which allows synchronous transaction processing while it is waiting for remote file data.
- Trace enhancements:
  - The OPEN, OPEN error, CLOSE, and managed-SAM control block traces have been re-configured.
  - The in-core wrap trace (0013) has been split into three distinct traces, therefore providing different levels of detail.
  - The in-core wrap trace can also be dumped to SYSLST, therefore providing continuous monitoring of internal VSE/VSAM activity.
  - A new control block trace has been implemented for the VSAM Redirector Connector.

For details, refer to the *VSE/VSAM User's Guide and Application Programming*, SC33-8316.

## Language Environment Enhancements

This is a summary of the enhancements and changes available with LE/VSE Version 1 Release 4 Modification Level 7:

- The *Linux Fast Path* function is new with z/VSE 4.3 (as described in “Support for the Linux Fast Path” on page 2). LE/VSE provides the *LE/C TCP/IP Socket API Multiplexer* which is used together with the Linux Fast Path. For details of how to configure the LE/C TCP/IP Socket API Multiplexer, see “TCP/IP Callable Functions” in the *LE/VSE C Run-Time Library Reference*, SC33-6689.
- Information has been provided about the use of the BEAR (“breaking event address register”) when analyzing dumps. For details, see “Using LE/VSE Debugging Facilities” in the *LE/VSE Debugging Guide and Run-Time Messages*, SC33-6681.
- Additional functionality has also been provided for debugging in the situation where a nonexistent routine has been called. For details, see “Debugging C Routines” in the *LE/VSE Debugging Guide and Run-Time Messages*, SC33-6681.
- LE/VSE now supports *PL/I multitasking*. For details, see “PL/I Multitasking Under LE/VSE” in the *LE/VSE Programming Guide*, SC33-6684.
- A new callable service *CEE5MC2—Get International Currency as String* has been introduced. You can use it to obtain the default currency symbol for a specified country symbol. For details, see “LE/VSE Callable Services” in the *LE/VSE Programming Reference*, SC33-6685.
- The international currency symbol for each country or region has been added to “Appendix A. IBM-Supplied Country/Region Code Defaults” in the *LE/VSE Programming Reference*, SC33-6685.

## EZA TCP/IP Interface Support for IPv6

TCP/IP-based network connectivity is a critical component in today's business environment. Furthermore, the limitations of the *Internet Protocol Version 4* (referred to simply as *IPv4*) together with increasing regulatory requirements have driven the need to support IPv6 (16-byte) TCP/IP addresses in z/VSE.

It has become apparent that IPv4 TCP/IP addresses are limited and are becoming exhausted with the rapidly expanding internet use.

The key IPv6 enhancement is the expansion of the IP address space from 32-bit addresses (4-byte) as used in IPv4 to *128-bit addresses* (16-byte) as used in IPv6. As a result, there will be a virtually unlimited number of IP addresses available for the foreseeable future. This addressing capability, together with simplified address configuration and management, makes IPv6 a critical component in the evolution of e-business (network connectivity) and the next-generation internet.

The *EZA TCP/IP programming interface* consists of the:

- EZASMI macro
- EZASOKET Call Interface.

This interface has been extended so you can use it together with IPv6.

**Note:** Check the documentation that accompanies the TCP/IP product you are using to see if this TCP/IP product includes and supports EZA IPv6 extensions.

The EZA programming interface now provides these EZA function calls:

- FREEADDRINFO
- GETADDRINFO
- GETNAMEINFO
- NTOP
- PTON

In addition to the above EZA functions:

- Certain parameters for *existing* EZA functions have been extended so they can be used with IPv6.
- The utility program EZACIC09 has been provided for your use. This utility program is helpful for COBOL programmers when processing information that has been returned from a GETADDRINFO function call.

IBM provides extensions that can be used with IPv6/VSE. They include the:

- EZASMI macro interface
- EZASOKET call interface

**Note:** These extensions and external interfaces might describe more functionality than is actually provided by the IPv6/VSE program. Therefore, you should check the individual function descriptions for any such exceptions.

For details of these enhancements, refer to the *z/VSE TCP/IP Support*, SC34-2604.

---

## Enhancements to z/VSE Optional Programs

### Encryption Facility With the OpenPGP Standard

The Encryption Facility for z/VSE (V1.1) was first introduced with z/VSE Version 4 Release 1 Modification Level 1. It is an optional, priced feature of VSE Central Functions Version 8. It is a host-based software solution designed to encrypt sensitive data before transferring it to tape for archival purposes, or to exchange with remote locations or business partners.

The *Encryption Facility for z/VSE OpenPGP (V1.2)* now supports the *OpenPGP standard*.

OpenPGP is a standard message format for ensuring the integrity of data that can be exchanged between trusted partners. It is designed to help provide data integrity through:

- Data encryption using either a randomly-generated symmetric session key or a password.
- OpenPGP certificates for the exchange of public key information.

OpenPGP support is designed to offer even more choice and flexibility for exchanging data with business partners. For example, it does not require that your business partners purchase new storage hardware, have a mainframe, or run z/VSE.

The Encryption Facility for z/VSE OpenPGP complies with selected OpenPGP (RFC 4880) features, and is designed to be compatible with other products that are OpenPGP-compliant. This support is designed to allow you to exchange an encrypted, compressed file between your internal data centers using the Encryption Facility for z/VSE OpenPGP and any remote site, external business partner, or vendor who has an OpenPGP-compliant client, regardless of server or operating system.

With OpenPGP support added to Encryption Facility for z/VSE, you now have a choice of *two* formats.

- *System z format*, introduced with the Encryption Facility for z/VSE V1.1.
- *OpenPGP format*, introduced with the Encryption Facility for z/VSE V1.2.

For further details, see “Implementing the Encryption Facility for z/VSE OpenPGP” in the *z/VSE Administration*, SC33-8304.

**Note:** Encryption Facility for z/VSE OpenPGP support is also available with z/VSE 4.2 and PTF(s).

### IBM WebSphere MQ for z/VSE

*IBM WebSphere MQ for z/VSE™* Version 3.0 (V3.0) is a new member of the WebSphere MQ family of messaging products. It is designed to help provide:

- improved interoperability on both distributed and mainframe platforms,
- potential performance enhancements.

WebSphere MQ for z/VSE is designed to enhance manageability through WebSphere MQ Explorer, as well as currency, and performance enhancements for the IBM z/VSE platform. It integrates with *IBM WebSphere MQ* in solutions for:

- Reliable application connectivity

- SOA connectivity with a proven messaging backbone
- A universal, multipurpose data transport

IBM WebSphere MQ for z/VSE V3.0 is a replacement for *MQSeries for VSE/ESA V2.1*.

For details of how to:

- install WebSphere MQ for z/VSE V3.0,
  - migrate from MQSeries for VSE/ESA V2.1 to WebSphere MQ for z/VSE V3.0,
- refer to the *WebSphere MQ for z/VSE System Management Guide*, GC34-6981.

**Note:** WebSphere MQ for z/VSE support is also available with z/VSE 4.2 and PTF(s).

## IBM Rational COBOL Runtime for z/VSE V7.5.0

*IBM Rational® COBOL Runtime for z/VSE V7.5* is designed to execute applications developed with the EGL (Enterprise Generation Language) capability of Rational Business Developer.

EGL, IBM's latest business language, frees developers to focus on the business problem rather than on the details of the target execution platforms and associated middleware. EGL is ideal for business-oriented development teams who value ease of learning and high productivity, but need to quickly deliver modern applications and services.

Rational COBOL Runtime for z/VSE provides the libraries to enable EGL code, generated as COBOL, to run on the z/VSE platform.

Using the new extension to Rational Business Developer, COBOL code can be generated and deployed in z/VSE as:

- Traditional 3270 CICS applications,
- Traditional batch applications,
- Application programs capable of being invoked from an EGL Web or Web 2.0 front-end, or from an EGL service on a distributed application server.

Rational COBOL Runtime for z/VSE 7.5 is the replacement for *VisualAge® Generator Server V1.2*.

For details of how to install Rational COBOL Runtime for z/VSE 7.5, refer to the *Rational COBOL VSE Runtime for z/VSE V7.5.0 Program Directory*, GC10-8803.

For details how to integrate Rational COBOL Runtime for z/VSE V7.5 in an IT infrastructure, refer to the document "Multiplatform Development and VSE" which you can find in the "Solutions" section of the *z/VSE Home Page* (see "Where to Find More Information" on page ix).

**Note:** IBM Rational COBOL Runtime for z/VSE V7.5 support is also available with z/VSE Version 4 Release 2 Modification Level 1, providing you install the appropriate PTF(s).

## DOS/VS RPG II Support for the CICS TS

DOS/VS RPG II support for the CICS Transaction Server for VSE/ESA (CICS TS) allows RPG programs that were implemented for CICS/VSE V2.3 to run with the

CICS TS. This support is necessary because from z/VSE 4.3 onwards, z/VSE will no longer offer CICS/VSE V2.3 (Program Number 5686-026) as part of the z/VSE package.

DOS/VS RPG II support for the CICS TS is also available with z/VSE 4.2. To use the DOS/VS RPG II support, you must install PTF UK58484 (for APAR PM16528) which is supplied together with these information APARs:

- II14447 (information/steps for enabling on z/VSE 4.2)
- II14452 (information/steps for enabling on z/VSE 4.3)

For further details, see “Using RPG II With the CICS Transaction Server” in the *z/VSE Administration*, SC33-8304.

## Support for IPv6/VSE

*IPv6/VSE* is a native implementation of Transmission Control Protocol/Internet Protocol (TCP/IP) and provides an *IPv6 solution* for z/VSE. The IPv6/VSE (5686-BS1) program has been licensed from *Barnard Software, Incorporated*.

Using IPv6/VSE, the IP address space is expanded from 32-bit addresses (4-byte) as used in IPv4 to *128-bit addresses* (16-byte) as used in IPv6. As a result, there is a virtually unlimited number of IP addresses available for the foreseeable future.

This addressing capability, together with simplified address configuration and management, makes IPv6 a critical component in the evolution of e-business (network connectivity) and the next-generation internet.

IPv6/VSE provides:

- an IPv6 TCP/IP stack
- IPv6 application programming interfaces (APIs)
- IPv6-enabled applications.

The *IPv6 TCP/IP stack of IPv6/VSE* can be run concurrently with an IPv4 TCP/IP stack within *one z/VSE system*. This is referred to as *dual stack support*. The IPv6 TCP/IP stack runs in a separate partition using its own stack ID.

Dual stack support addresses both performance and reliability aspects:

- Existing IPv4 applications continue to run unchanged using the IPv4 TCP/IP stack, thus protecting and leveraging existing investments.
- New IPv6-enabled applications can be gradually introduced using the IPv6 stack of IPv6/VSE.

## Storage Constraint Relief in 24-bit Area of CICS/DLI Partition

z/VSE 4.3 includes a new release (Version 1 Release 12.1) of DL/I VSE.

The Version 1 Release 12.1 of DL/I VSE provides storage constraint relief in the 24-bit area of a CICS/DLI partition.

In a CICS/DLI online environment, the following DL/I resources can be allocated in 31-bit storage *above the 16 MB line*:

- Load PSBs and their transaction working copies.
- HD ESDS buffers.
- DL/I action modules and user exit routines.



Using the DLZACT online generation macro, you can instruct DL/I to allocate PSBs and HD buffers above the 16 MB line. All DL/I control blocks not included in the PSB will be allocated below the 16 MB line.

To allocate PSBs and/or HD buffers above the 16 MB line, you use the DLZACT TYPE=CONFIG control statement. To allocate:

- PSBs above the 16 MB line, you set parameter PSBLOC=ANY.
- HD buffers above the 16 MB line, you set parameter HMODE=ANY.

Starting with DL/I Release 1.12, when running in an *online* environment DL/I also loads its action modules above the 16 MB line. When running in a *batch* environment, DL/I continues to load its action modules below the 16 MB line.

The DL/I action modules might also be loaded into the SVA-high. In this case, the action modules will be accessed via the SVA (both in the online and batch environments).

**Note:** Vendor-supplied programs that have *not* been enabled for 31-bit addressing *might not work!* In such situations, contact your appropriate Vendor.

For further details, refer to the *DL/I Release Guide*, SC33-6211-06.

## Dump Handling Enhancements

These are the main enhancements in the area of dump handling:

- How to upload a dump from tape that is larger than (approximately) 1 GB is now described.
- The use of the PARM parameter together with DOSVSDMP is now described.
- The SDAID trace now displays 16 floating point registers and one floating point control register.

For details of these enhancements, refer to the *z/VSE Diagnosis Tools*, SC33-8313.

---

## Items Dropped With z/VSE 4.3

### CICS/VSE No longer Offered As Part of z/VSE

From z/VSE 4.3 onwards, z/VSE will no longer offer CICS/VSE V2.3 (Program Number 5686-026) as part of the z/VSE package.

This means, the CICS co-existence environment is *no longer supported*.

If you use DOS/VS RPG II with CICS/VSE and wish to continue using DOS/VS RPG II in a *CICS Transaction Server* environment, you must perform the migration steps described in "Using RPG II With the CICS Transaction Server" in the *z/VSE Administration*, SC33-8304.

### DL/I V1.10 and V1.11 No Longer Supported

From z/VSE 4.3 onwards, there is no support for:

- *DL/I V1.10*
- *DL/I V1.11*

Both of the above programs have the Program Number 5746-XX1.

The replacement program for *DL/I V1.10* and *DL/I V1.11* is *DL/I V1.12*. For details, refer to the *DL/I Release Guide*, SC33-6211.

### VisualAge Generator Server for MVS, VM and VSE, No Longer Supported

From z/VSE 4.3 onwards, there is no support for the *VisualAge Generator Server for MVS™, VM and VSE* (Product ID 5648-B02), also referred to as *VisualGen Host Services*.

### MQSeries for VSE/ESA No Longer Supported

From z/VSE 4.3 onwards, there is no support for *MQSeries for VSE/ESA* (Product ID 5686-A06).

The replacement program for MQSeries for VSE/ESA is *Websphere MQ for z/VSE* (Product ID 5655-U97). See "IBM WebSphere MQ for z/VSE" on page 16.

### Tape Mode '05' Not Supported for TPA

From z/VSE 4.3 onwards, you *cannot* ADD a TPA tape drive with either:

- tape mode '05'
- a tape mode which includes tape mode '05' (such as '25').

For example, you cannot use the following statement to ADD a TPA tape device with tape mode '05':

```
ADD cuu,TPA,05
```

If you have added a TPA tape drive in a previous z/VSE release that has any of the tape modes described above, you will receive an appropriate error message either:

- during an FSU to z/VSE 4.3.
- whenever an ADD statement (such as the one above) is processed during an IPL.



As a replacement for the dropped support for tape mode '05', z/VSE 4.3 now supports additional device types for use with the IPL ADD statement. These device types allow the track format of a tape unit to be identified *at IPL time*. For details, refer to the *z/VSE System Control Statements*, SC33-8305.



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