

z/VSE®

Version (Release) and Hardware Upgrade

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Last Update: October 30, 2017

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Preface

z/VSE customers regularly face the migration topic either when upgrading to a new z/VSE version or release or when upgrading hardware.

While most migration aspects are documented within the official z/VSE books, this very document is intended to provide a structured overview that lists all z/VSE areas that are affected by migration, and gives advice on essential migration steps. But most important this migration white-paper is intended to provide a single source of reference.

Customers who need migration relevant information which is not included within this document can request it via email at: zvse@de.ibm.com

Note: Although this document describes general migration aspects, the focus is the migration to z/VSE V6.

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1 Migration – General Considerations

Migration topics address both a processor upgrade and a z/VSE upgrade. A z/VSE upgrade can be an upgrade to a new release or to a new version.

Note 1:

Hardware upgrade can also be a disk upgrade, and the usage of new I/O, networking, and crypto cards. This is addressed in a separate chapter.

Note 2:

Installation of z/VSE PTFs is not denoted as z/VSE upgrade.

This article describes the tasks to be performed when upgrading hardware and / or z/VSE.

1.1 Task: Collect Reference Data

Before migration is started, either hardware upgrade or software upgrade or both, customer should measure and collect the most important workload parameters such as performance, I/O activity, CPU time, and elapsed time to have reference data available.

For more information see chapter Collect Reference Measurement Data on page 49.

1.2 Task: Backup your data and system

In general, customers should always have a backup of their data, not only if a migration is to be performed. Preferable is also to have a backup of the complete system, so that it can be restored easily.

1.3 Obtain required Software Licenses

When a new version of a licensed product is delivered, you need a new license. This applies also for products that are included in the z/VSE base system, such as CICS TS, TCP/IP for z/VSE, IPv6/VSE and others.

A new release of a product does not require a new license.

A new license is required for IBM TCP/IP for z/VSE V2 and CICS TS for z/VSE V2:

- Customers using IBM TCP/IP for VSE/ESA V1.5 on z/VSE V5, require a new license for IBM TCP/IP for z/VSE V2 when ordering z/VSE V6. Customers using both the Application Pak and the GPS feature of TCP/IP for z/VSE V2 require a new license for each feature.
- Customers using CICS TS for VSE/ESA V1.1.1 require a new license for CICS TS for z/VSE V2 when ordering z/VSE V6.

In order to ensure licensing for IBM TCP/IP for z/VSE V2, and CICS TS for z/VSE V2, you need to select the applicable product(s) when ordering z/VSE V6 in Shopz. Alternatively you can place an additional order for either of the products, if you have ordered z/VSE V6 already.

Note:

If you already have a license for CICS TS for z/VSE V2.1 and IBM TCP/IP for z/VSE V2.1 you don't need a new one when upgrading to z/VSE V6.2 with CICS TS for z/VSE V2.2 and TCP/IP for z/VSE V2.2.

1.4 General Recommendation

Customer who intend to upgrade both hardware (processor) and the z/VSE release, should do it one at a time.

Recommendation:

1. Upgrade to a new processor (see chapter Processor (Hardware) Upgrade, page 11)
2. Go into production to have reference data
3. Upgrade z/VSE (see chapter z/VSE Release or z/VSE Version Upgrade, page 17)

Note:

If a customer decides to upgrade z/VSE first, it should be considered, that some z/VSE releases require an architecture level set (ALS). So customers might be required to upgrade to a new processor first.

1.4.1 Architecture Level Set (ALS):

- z/VSE V5.1 requires z9, or later.
- z/VSE V6.1 requires z10, or later.
- z/VSE V6.2 requires z196 / z114, or later.
- z/VM V5.4 does not run on a z13 or later.
- z/VM V6.1 requires z10 or later. It does not run on a z13, or later.
- z/VM V6.2 requires z10 or later. It does not run on a z14, or later.
- z/VM V6.3 requires z10 or later.
- z/VM V6.4 requires z196 (z114), or later.

Please see also the z/VSE status page

<http://www.ibm.com/systems/z/os/zvse/about/status.html> and the z/VM home page.

If you are running z/VSE in a z/VM guest environment, you also should check the z/VM requirements.

The following chapters describe the tasks to be performed when upgrading hardware and/or software.

1.4.2 Link to z/VSE documentation

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

2 Backup your Data or System

This chapter lists various methods how to back up your data or system.

Utilities to back up a volume (disk).

- z/VSE FlashCopy
- ICKDSF PPRC
- DDR for z/VM guests
- VSE/FastCopy
- VSE/VSAM IDCAMS SNAP (note that the VOLID is not preserved).

Whatever method you choose, ensure that you have consistent data.

For example, if you do a VSE/FastCopy it is recommended to shutdown you partitions to ensure that data are not modified during the FastCopy.

To copy VSAM data, ensure that you have a consistent copy of the volume that holds the catalog and all volumes with data space that belong to that catalog.

If you don't want a copy of an entire volume, but only selected data, you can also use the utilities provided by the product that created the data.

3 Processor (Hardware) Upgrade

3.1 Tasks to be performed:

- Check the Preventive Service Planning (PSP) bucket of the processor
- Install the z/VSE PTFs that are required to either
 - Run your z/VSE release on the new processor or
 - Use a specific function provided by the processor or
 - Use a new I/O, networking, or crypto card
- Review and/or update software definitions
- Upgrade hardware (processor)

3.1.1 Task: Check the PSP Bucket

The hardware PSP bucket lists PTFs that are required to

- run z/VSE on the new processor or
- use specific functions or
- use I/O, networking, and crypto cards that are newly shipped with this processor

It always includes the IOCP, EREP, and HLASM PTFs for the processor.

The PSP bucket exists for z/VSE, z/VM, and z/OS (keyword: subset).

Not all PTFs of the PSP bucket might be needed for your environment:

Example:

- a) If a PTF is required to support a new crypto feature, and you do not intend to use this feature, there is no need to install the PTF.
- b) If you don't use OSA/SF, there is no need to install the OSA/SF PTF

3.1.1.1 Where to find PSP Bucket

There is a PSP bucket for each processor. You need to know the device type of the processor (see below).

You can find PSP buckets on the web. For example search for **3906/ZVSE** to get the z/VSE PSP for the z14.

The link to the PSP bucket can also be found on the z/VSE homepage.

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

Processor	Device type
z9 EC	2094
z9 BC	2096
z10 EC	2097

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z10 BC	2098
z196	2817
z114	2818
zEC12	2827
zBC12	2828
z13	2964
z13s	2965
z14	3906

For customers with access to RETAIN:

PSP

R

ENTER UPGRADE/SUBSET ID UPGRADE ID ==> **2827DEVICE**
SUBSET: **2827/ZVSE**

(2827 is the zEC12 device type)

ENTER UPGRADE/SUBSET ID UPGRADE ID ==> **3906DEVICE**
SUBSET: **3906/ZVSE**

(3906 is the z14 device type)

3.1.2 Task: Install the required z/VSE, z/VM, vendor PTFs

- Install the required z/VSE PTFs as listed in the PSP bucket of the processor.
- If running under z/VM:
 - Check the z/VM homepage and PSP bucket for z/VM requirements
 - Install the required z/VM PTFs.
- Contact your vendor if vendor software needs to be updated
 - Vendor software might be dependent on processor model, e.g. for billing purposes
 - (for example IPv6/VSE (BSI) includes the CPU model in the license key)
- If subcapacity pricing is used ensure that the latest SCRT version is used to generate your SCRT report.
 - the SCRT version must support the processor type

3.1.3 Task: Review / Update Software Definitions

3.1.3.1 Review / Update z/VSE Definitions

- If running CMT (for SCRT sub-capacity pricing):
 - Stop CMT processing prior to move to the new processor:

- EXEC IJBCMT,PARM='STOP'
- Consider to save your CMT files
- Check whether \$ASIPROC.PROC is used to select IPL & JCL procedures
 - If yes, include CPUID of the new processor in \$ASIPROC
- When shared resources (ADD ...SHR) are used, check DLF (LOCK file definition)
 - Initialize Lock File on 1st IPL of the first z/VSE system that is IPLed on new processor (CPUID is part of the lock file id)
 - Use IPL command DLF .. TYPE=F (F for format)
 - After IPL, change to DLF ... TYPE=N

3.1.3.2 Review / Update Software (z/VM) Definitions

- Check if the z/VM release you are currently use is supported on the new processor.
- Review the definitions of the guest systems (number of virtual CPUs, SHARE, CPUIDs, storage, network definitions, and others)

3.1.3.3 Review / Update Software (Vendor) Definitions

Contact your vendor and check:

- Does vendor software need to be updated prior or after move to the new processor?
- Is the vendor license processor dependent?
- Do you need a new license to run the vendor product on the new processor?

3.1.4 Task: Processor Upgrade

- Generate IOCDS for new hardware
- Define the LPAR(s) you need
 - In each LPAR (LPAR profile):
 - Define processor storage needed for LPAR
 - Central Processor (CP) definitions (number, shared, dedicated, weight, ...)
 - Be careful if using dedicated CPs
 - Check how many CPUs are used in the z/VSE SYSDEF TD,START= command
- If you use the OSA-Express Integrated Console Controller (OSA-ICC) function (CHPID type OSC), configure your terminal emulation sessions
- If you use OSA-Express (CHPID type OSE) for SNA or TCP/IP pass thru traffic, configure your devices using OSA/SF:
 - Use OSA/SF in HMC for OSA-Express4S or later (on zEC12 or later)
 - Use the z/VSE OSA/SF software component for OSA-Express3 or older. Install the latest OSA/SF PTFs if needed.
 - The z/VSE OSA/SF software component does not support OSA-Express5S or later.

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- If possible: IPL your z/VSE test systems on the new processor, perform tests before you IPL your production LPARs

3.1.5 Task: Upgrade to an IBM z14 Processor

This sections describes what has to be considered when upgrading to an IBM z14. You can always find the actual information on the z/VSE home page.

Supported environments:

	LPAR image	z/VM 6.3, 6.4, with PTFs	z/VM 5.4, 6.1, 6.2
z/VSE V6.2	Yes	Yes	No
z/VSE V6.1	Yes	Yes	No
z/VSE V5.2	Yes	Yes	No

If you plan to upgrade to a z14 with a z/VSE releases that is no longer in service:

	LPAR image	z/VM 6.3, 6.4, with PTFs SET MACH Z	z/VM 6.3, 6.4, with PTFs SET MACH ESA
z/VSE V5.1	Yes. Requires PTF UD54170	Yes. Requires PTF UD54170	Yes
z/VSE V4	No	No	Yes
z/VSE V3.1	No	No	No

Regarding PTFs see the PSP bucket for the 3906DEVICE.

http://www.ibm.com/support/docview.wss?uid=isg1_3906DEVICE_3906-ZVSE

3.2 Upgrade to new (disk, tape) Hardware

In general the same considerations as for a processor apply:

- Check the PSP bucket of the device type for required PTFs
- Install the PTFs
- Upgrade hardware

3.2.1 Concurrent microcode upgrade for IBM system storage

Please consult your device documentation.

Recommendation for IBM disk storage:

(E)CDK disks: z/VSE recommends to shut down the z/VSE system prior to the microcode upgrade.

FCP-attached SCSI disks: z/VSE does not support concurrent microcode upgrade for FCP-attached SCSI disks.

Recommendation for IBM tape storage:

z/VSE with the latest service level supports concurrent microcode upgrade for IBM tape storage. z/VSE recommends to take the tape units offline (z/VSE OFFLINE command) prior to the microcode upgrade or use the next maintenance window. Once the upgrade completed, take the tape units online again (z/VSE ONLINE command). Please check with your software vendors (e.g. tape management systems), if they support concurrent microcode.

4 z/VSE Release or z/VSE Version Upgrade

This chapter addresses general migration aspects when upgrading to a new z/VSE release or version (from now on called target z/VSE release or target system) with focus on z/VSE V6.2 and z/VSE V6.1.

The z/VSE system which is currently used is called source system.

z/VSE V6.2:

- **Hardware Requirements:**
 - z/VSE V6.2 requires z196 (z114), or later.
 - 3380 type disks (or 3390 type disks in 3380 track compatibility mode) are no longer supported as system disks. These disk types are still supported as data disks.
- **Installation:**
 - z/VSE V6.2 can be installed using an initial installation
 - Fast Service Upgrade prerequisites (if the prerequisites are not fulfilled initial installation is required):
 - Upgrading via FSU is only supported from z/VSE V6.1.
 - z/VSE V6.1 must run on a z196 (z114), or later.
 - DOSRES must not be a 3380 type disk or (or 3390 type disks in 3380 track compatibility mode)

z/VSE V6.1:

- **Hardware Requirements:**
 - z/VSE V6.1 requires z10 or later.
- **Installation:**
 - z/VSE V6.1 requires an initial installation
 - Fast Service Upgrade (FSU) to z/VSE V6.1 is not supported.

4.1 Planning Tasks to be performed

- If upgrading to a target z/VSE version / release you have to choose between initial installation and FSU, if FSU is supported.
- Whatever option you choose, you first have to install the hardware that is required by your target z/VSE release (for example z/VSE 6.1 is ALS z10, or later, z/VSE 6.2 is z196 (z114), or later).
- Contact your vendors if updates are needed for the target z/VSE release. If updates are needed ask the vendor if these updates should be installed on the source system or target system.
- Get an MSHP Retrace of your system. This shows the installed product and the service level of these products.

- For initial installation or FSU always use the latest refresh level of the z/VSE release you want to install.
- The latest refresh level might not include the latest PTFs. Therefore after initial installation or FSU you should install the recommended service level (RSL) and the latest PSP bucket. You can find the information on the z/VSE home page <http://www.ibm.com/systems/z/os/zvse/support/>

4.2 Pre Migration Tasks - DTSECTXN

Users upgrading to z/VSE V6.1 or z/VSE V6.2:

If you still use the DTSECTXN to protect your CICS transactions it is strongly recommended to migrate the DTSECTXN definitions to the BSM Control File on your source system.

See ‘DTSECTXN versus BSM Control File’ on page 30 for details.

4.3 Post Migration Tasks

Create a standalone dump tape or standalone dump disk. The version of the standalone dump must conform to the version of your z/VSE system.

4.4 Initial Installation

Initial installation is always possible and sometimes mandatory.

When is initial installation mandatory?

- The target z/VSE release requires initial installation (as it is for z/VSE 6.1)
- Releases prior to VSE/ESA 2.4 cannot be migrated to any target release using FSU.
- A change of the system disk architecture (DOSRES, SYSWK1) requires initial installation.
 - ECKD type 3380 to ECKD type 3390
 - ECKD to SCSI
 - ECKD to z/VM emulated FBA
- A change of the system language requires initial installation
 - for example Kanji – English

After you have installed your target z/VSE release, the next step is to migrate your data and system definitions.

4.5 Fast Service Upgrade (FSU)

This is a general description. It does not apply to z/VSE V6.2 only.

You can perform a Fast Service Upgrade (FSU) to install a new modification level of z/VSE, referred to as performing a service refresh, or to install a new version / release of z/VSE, referred to as performing a release upgrade.

The FSU process is described in detail in the book *z/VSE System Upgrade and Service*. Use the version of the book corresponding to your target release.

The FSU process:

- Upgrades IBM system libraries.
- Upgrades system definitions
 - Therefore, it is not recommended that you place private members like phases, or procedures in IBM system libraries.
- Maintains user data
- Maintains installed (optional) products.
 - It is recommended to upgrade them as well after the FSU is complete.
 - Upgrade the products from the extended base tape or optional product tape that corresponds to the target z/VSE release.
- Maintains hardware configuration, network, VTAM, and CICS definitions
- When FSU is complete, it might be needed to adapt your system configuration to new IBM default values. Consult the z/VSE Program Directory on the z/VSE home page that corresponds to the target z/VSE release.

5 Task: Migrate System Configuration

This applies to initial installation and might also be needed after FSU.

After FSU:

- The FSU process keeps your configuration. However, z/VSE system defaults might have changed and it is recommended to adapt your configuration. Consult the z/VSE Program Directory corresponding to the target z/VSE release.

After Initial Installation:

After initial installation z/VSE default values are set. You need to migrate your system configuration such as:

- IPL procedure
 - You might want to adapt your IPL procedure to run with NOPDS (no page data set) in case you have enough processor or z/VM storage available.
- Batch jobs including JCL procedures
- LIBDEF statements.
- Library configuration members containing for example network (TCP/IP) definitions and VTAM books

5.1 Reference Material and further information:

- **z/VSE Planning** manual: “Migrating From Earlier Releases”
- **z/VSE Installation** manual
- **z/VSE System Upgrade and Service** manual

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

6 Task: Data Migration

- In order to migrate a particular type of data, use the utilities provided by the product that created the data.
- The topics regarding data migration assume that you do not change the device type of your disks during the migration. If you migrate from an ECKD-based system to a SCSI system, there is a special Whitepaper: z/VSE SCSI Support and Migration Options which can be found on the z/VSE home page.
<http://www.ibm.com/systems/z/os/zvse/documentation/>
- If you do initial installation, migrate your jobs / batch environment to your target system. This includes JCL commands / statements such as ASSGN, DLBL, and EXTENT. Since this is needed for all types of data, it is not specifically mentioned in the following chapters.

6.1 Migration of VSE/VSAM Data

With z/VSE V4.3, and z/VSE V5, there were changes in VSE/VSAM. For example selected VSE/VSAM control blocks were moved into 31-bit storage.

Before you start the migration, you should:

- Have a backup of your VSAM data (IDCAMS BACKUP) available.
- Apply the latest maintenance level on your current system. This is especially important if you want to share VSE/VSAM catalogs of your current system (for example z/VSE 4.2) with VSE/VSAM catalogs on an upgraded system (for example z/VSE V5 or z/VSE V6).
- Contact your vendors, if updates are needed. If yes, ask them if these updates should be installed on the source or on the target system or both.
- For FSU or initial installation use the latest z/VSE refresh level.
- To prepare the migration you can do a LISTCAT ALL on your current system and do a catalog check using the tool Multi Instant Logic Analyzer 4VSAM v1.4. This tool can be downloaded from the z/VSE home page:
<http://www.ibm.com/systems/z/os/zvse/downloads/tools.html>

After FSU:

Apply the recommended service level (RSL), and the PSP bucket if available.

The data are kept during FSU. Do a LISTCAT ALL and compare with the LISTCAT done prior to FSU.

No further actions are required.

After Initial Installation:

Apply the recommended service level (RSL), and the PSP bucket if available.

The IDCAMS LISTCAT function can be used to get the size of currently used clusters on your source system. You can take these values to redefine your clusters on the target system if needed.

If you are using separate non-system disks for your VSAM user catalogues and space:

- Change the IPL procedure on your target system to ADD those non-system disks
- Shutdown your source system
- IPL your target system with the changed IPL procedure
- Do not use the disks on your source system any longer.
 - To clean-up your source system you could do an IDCAMS EXPORT – DISCONNECT on your source system to remove the catalogs. Afterwards the catalogues are no longer available on your source system.
- Do an IDCAMS IMPORT – CONNECT to import the user catalogs on your target system.

If you want to migrate your clusters:

- You can use the IDCAMS Backup / Restore function. This function allows to migrate several clusters all at once. It does not only move data but also defines the clusters in the target catalog.
- You can Backup/Restore to and from tape or use a sequential disk file.

If you want a copy of an entire volume, you can use FlashCopy, DDR (when running under z/VM), VSE/FastCopy, or the ICKDSF PPRC function.

- Before you do copy the entire volume, shutdown the partitions on your source system so that no data access takes place. This is recommended for all copy methods.
- For each catalog, all the volumes belonging to this catalog have to be copied, too.
- The target disks have to have the same model type, for example 3390-9.

Note:

For VSE/VSAM IDCAMS SNAP both the source and the target volume must be online. Since a VOLID must be unique within z/VSE, the target volume must have a different VOLID than the source volume.

Note:

Do not use VSE/VSAM services to migrate libraries in VSAM managed space.

Instead use LIBRarian commands.

See chapter Migration of z/VSE Libraries, page 26

6.1.1 Reference Material and Further Information

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

VSAM User's Guide and Application Programming:

Chapter 4. Tasks under VSE/VSAM

Section "Catalog and File Migration"

Chapter 8. VSE/VSAM Support for SAM Files

Section "Levels of Migrating Data and Programs from SAM to VSE/VSAM Control"

Chapter 8. VSE/VSAM

Section "Migration"

6.2 Migration of ICCF Libraries (DTSFILE)

Recommendation:

z/VSE provided members in ICCF system libraries should not be modified by customers. To ease a later migration, customers should not place own members in ICCF system libraries. ICCF user libraries are 3 to 7, 11 to 49, and 70 to 199. All other ICCF libraries are system libraries.

After FSU:

The FSU process replaces z/VSE provided members in the ICCF system libraries.

All other members that is members in user libraries as well as customer provided members in system libraries are not touched by FSU.

Adapt skeletons in your private libraries to match the skeletons that were modified in the system libraries.

After initial installation:

To migrate your ICCF user libraries, you need a backup of your ICCF libraries taken on the source system. For that purpose, IUI (Interactive User Interface) offers a dialog.

On the source system select:

- 3 Operations
- 7 Backup/Restore
- 4 Backup ICCF Library on Tape
- 1 Backup the DTSFILE (all ICCF Libraries)

On the target z/VSE release select:

- 3 Operations
- 7 Backup/Restore
- 5 Restore ICCF Library from Tape
- 2 Restore one ICCF Library

You can modify the generated job to restore selected user libraries.

Do NOT select '1 Restore the DTSFILE (all ICCF Libraries)'. This would restore ICCF system libraries as well and therefore would destroy your system.

In case you need to migrate single members, you can also use

- 3 Export ICCF Library Members to Tape and
- 4 Import Export ICCF Library Member

In case ICCF system libraries were erroneously restored, you can reload them from the installation tape using skeleton SKICFRST. If you used an installation disk, you should create a virtual installation tape to restore your ICCF system libraries.

6.2.1 Reference Material and Further Information

- **z/VSE Planning**
- **z/VSE Administration**

6.3 Migration of a DL/I Database

DL/I 1.12 is the latest DL/I version. It replaces DL/I 1.11 and DL/I 1.10.

Starting with z/VSE 4.3, DL/I 1.12 is the only DL/I version that can be used.

Regarding migrating from DL/I 1.10, or DL/I 1.11 to DL/I V1.12 please refer to the DL/I V1.12 Release Guide.

After FSU:

- Your data (VSAM clusters) are still available.
- Assuming you are already using DL/I 1.12, no further action is required.
- If not, refer to the DL/I V1.12 Release Guide regarding upgrade to DL/I 1.12.

After Initial Installation:

Install the DL/I 1.12 optional product, shipped with your z/VSE order.

If you already use DL/I 1.12 on your source system:

- Migrate your DMB and PSB phases to your target system. A re-compile or re-link is not required.
- Migrate your DLZNUCxx nucleus phase for DL/I online (CICS) processing. A re-compile or re-link is not required.

If you use a DL/I 1.10 or DL/I 1.11 on your source system:

- Refer to the DL/I V1.12 Release Guide how to upgrade the DMB and PSB phases as well as the DLZNUCxx phase.

For data migration, that is the migration of corresponding VSE/VSAM clusters, you can use:

- IDCAMS Backup/Restore or
- IDCAMS IMPORT – CONNECT if you have separate disks

Note:

You can also use the utilities provided by the DL/I product to migrate your data.

6.4 Migration of a DB2 Database

Only use the utilities provided by DB2 to migrate your data.

- Define the VSAM catalogues and clusters on the target system.
- Use DBSU UNLOAD / RELOAD to migrate your data

6.4.1 DB2 and DFHCSDUP

Change the SIZE parameter in EXEC DFHCSDUP within members ARIS75JD.Z and ARIS75KD.Z to SIZE=500K

6.5 Migration of z/VSE Libraries

Use the LIBRarian BACKUP / RESTORE function to migrate your libraries.
This is also required for libraries in VSAM managed space.

6.6 Migration of SAM Files

If you need to migrate your SAM files you can use DITTO copy function (for example copy / restore to / from tape) to migrate your SAM files.

You can find your files using the LVTOC program.

Alternatively, you can also use the VSE/Fastcopy function to migrate your SAM files.

7 Task: Maintain System History File

The System History File contains information about the products installed on your system and the service applied to these products.

After initial installation or FSU to a general availability (GA) level of a new release or version of z/VSE (for example z/VSE 6.1.0), the system history file does not show the APARs for products with a new release or version level (CLC). The APARS that were integrated in this new release or version can be found in the corresponding z/VSE Program Directory. For products without a new CLC, the system history file shows the accumulated APARs since the GA of the last release or version.

After FSU

All previously installed optional and vendor products are still reflected in the history file. However, it is recommended to reinstall these products on the newest level.

After initial installation

The System History File does no longer contain optional and vendor products. Therefore it is recommended:

- Optional Products should be reinstalled on newest level
- Vendor Products should be reinstalled on newest level

8 Task: Migrate Security Definitions

Security is a major part of your migration effort since it affects many different areas of your system and ensures the safety of your data.

The migration in this section refers to the IBM-provided Basic Security Manager (BSM) and the related repositories (control files) for the security definitions.

If you use an External Security Manager (ESM) contact your vendor regarding migration.

These are the control files:

- z/VSE control file VSE.CONTROL.FILE (IESCNTL)
- User profiles in ICCF DTSFILE
 - Application users are defined in IESCNTL only.
 - ICCF users (administrator, operator, and programmer) are defined in the DTSFILE and IESCNTL.
- BSM control file VSE.BSTCNTL.FILE (BSTCNTL)
- DTSECTAB
- LDAP mapping file

Note:

Starting with z/VSE 6.2, CICS transactions can no longer be protected using DTSECTXN.

8.1.1 Migrate VSE.CONTROL.FILE

The VSE.CONTROL.FILE contains all security-related user profile information.

After FSU:

If you upgraded to a target z/VSE release using FSU no further actions are required, except a rebuild of the selection panels (use IUI dialog 2-1-2) and the system application profiles (use IUI dialog 2-1-3). The rebuild has to be done with user id SYSA.

After initial installation:

If you upgraded using initial installation, use the IESBLDUP utility to migrate

- the VSE.CONTROL.FILE and
- the user profiles in the ICCF DTSFILE

The IESBLDUP utility requires backups of the VSE.CONTROL.FILE and ICCF DTSFILE of your source system.

Details how to use the IESBLDUP utility are described in the z/VSE manual System Utilities.

Note:

It is recommended that you first verify that your applications work correctly on your target z/VSE system and afterwards migrate the VSE.CONTROL.FILE.

8.1.2 Migrate BSM CONTROL FILE

The BSM control file VSE.BSTCNTL.FILE (BSTCNTL) contains information about resource classes. The information is stored in resource profiles, which are used to control access to these resources. One resource class for example is TCICSTRN. The transaction profiles in this class control the access to CICS transactions.

After FSU:

Nothing to do.

After initial installation:

After initial installation you have to migrate your BSM control file to your target system.

- Do NOT migrate the BSTCNTL file using a VSE/VSAM function. Follow the steps described in the z/VSE Administration book chapter 'Migrating z/VSE Security' Definitions':
- On your source system, run the batch program BSTSAVER to build BSTADMIN commands from the contents of the BSM control file. These are saved in a librarian member.
- Move the librarian member to the target system
- Run the BSTADMIN program to process the BSTADMIN commands of the librarian member (created by BSTSAVER) and to rebuild the security data space.
- You can use skeleton SKBSTSAV in ICCF library 59 to build the jobs that invoke the BSTSAVER and BSTADMIN programs.

8.1.3 Migrate DTSECTAB – batch security definitions

z/VSE batch security uses the table DTSECTAB (DTSECTAB.PHASE) in sub-library IJSYSRS.SYSLIB. Resources that can be protected with DTSECTAB are libraries, sub-libraries, library members and files. Except for user FORSEC and user DUMMY, the DTSECTAB does not contain user profiles.

After FSU:

Your DTSECTAB is still available in sub-library IJSYSRS.SYSLIB provided a copy of DTSECTAB.PHASE was available in PRD2.SAVE when you started the FSU process.

After initial installation:

Move the source of your table DTSECTAB to the target system. Re-assemble and re-link it on your target system.

8.1.4 Unique Group (GRP) and User ID (UID) names

Starting with z/VSE 5.2 Unique Group (GRP) and User ID (UID) names are ensured. User IDs and groups with identical names may lead to unwanted behaviour on access list processing. Therefore, starting with z/VSE V5.2, the BSM will not allow new groups with the same name as existing user ids, and vice versa.

Adding a user with the name of an existing group will be rejected by the Interactive User Interface with message:

```
'U0000055' ALREADY EXISTS AS BSM GROUP NAME, PLEASE ENTER A UNIQUE USER ID.
```

8.1.5 Task: Migrate LDAP mapping file

You can use the EXPORT command of the LDAP mapping tool IESLDUMA to migrate the LDAP mapping file.

8.1.6 DTSECTXN versus BSM Control File

- Up to z/VSE V3.1.0, CICS transactions were protected using the access control table DTSECTXN.
- Starting with z/VSE V3.1.1, the BSM control file was introduced. The BSM control file uses the resource class TCICSTRN to protect CICS transaction.
- Up to z/VSE V6.1, DTSECTXN can exist in parallel to the BSM control file. That is, CICS transactions can still be protected using DTSECTXN.
- Starting with z/VSE V6.1, the IUI dialog supporting the migration from DTSECTXN to the BSM control file is no longer available.
- Starting with z/VSE V6.2, DTSECTXN is no longer supported, that is transactions that were protected by DTSECTXN will no longer work.

Note:

- Up to z/VSE V6.1, if the DTSECTXN phase is available, it is used by the BSM, even if the transactions are also defined in the BSM control file.
- Therefore, once you have completed the migration from DTSECTXN to the BSM control file, delete the DTSECTXN phase from your system.

8.1.7 Migrate the DTSECTXN to the BSM Control File

You can migrate the DTSECTXN definitions to the BSM control file either on your source or on your target system.

The recommendation is to do the migration on your source system.

The migration is described in detail in the z/VSE 5.2 Administration manual.

8.1.7.1 Migrate the DTSECTXN definitions on the source system

Prerequisite: The source system is z/VSE V3.1.1, or later.

Migrating the DTSECTXN definitions on your source system, allows you to immediately perform a test using the BSM.CONTROL.FILE

Migrate the DTSECTXN definitions to the BSM control file before you migrate the BSM control file to the target system as described in chapter Migrate BSM CONTROL FILE, page 29. This allows you to immediately perform a test using the BSM.CONTROL.FILE on your source system.

To migrate the DTSECTXN definitions to the BSM control file:

- If your system is z/VSE V5.2 or older:
 - Use IUI dialog 2-8-5 to generate a job with BSTADMIN commands to create resource profiles.
 - Run the job
 - Use IUI dialog 2-1-1 (PF6=GROUPS) to generate a job with BSTADMIN commands to update the group profiles.
 - Run the job
- If your system is z/VSE 6.1 or later, the dialog is no longer available on your source system. Follow the instructions as described in ‘Migrate the DTSECTXN definitions manually (without IUI dialog)’ on page 32.

After you have performed the migration to the BSM control file, you have to delete the phase DTSECTXN. Otherwise, up to z/VSE V6.1, the BSM will still use DTSECTXN.

8.1.8 Migrate the DTSECTXN definitions on the target system

After FSU to z/VSE V6.2:

Transactions protected by DTSECTXN will no longer work. Before you can use the transactions again, you have to perform the DTSECTXN migration on your z/VSE V6.2 system as described in ‘Migrate the DTSECTXN definitions manually (without IUI dialog)’ on page 32.

After FSU to z/VSE V5.2:

The DTSECTXN is still available and is used by the BSM. You can use the IUI dialog 2-8-5 to perform the migration, which is recommended. Alternatively, you can follow the instructions as

described in ‘Migrate the DTSECTXN definitions manually (without IUI dialog)’ Migrate the DTSECTXN definitions manually on page 32.

After initial installation:

The BSM uses the TCICSTRN resource class to protect CICS transactions.

You first have to transfer the library member DTSECTXS.A to the target system.

You can then migrate to the BSM control file as described in ‘Migrate the DTSECTXN definitions manually (without IUI dialog)’ on page 32.

8.1.8.1 Migrate the DTSECTXN definitions manually (without IUI dialog)

Starting with z/VSE V6.1, this method has to be used.

The DTSECTXN definitions are contained in the library member DTSECTXS.A. These definitions need to be converted in BSTADMIN commands.

You can use skeleton SKSECVTX in ICCF library 59 to generate the REXX procedure DTSECVTX.PROC. This procedure, when executed, uses as input the member DTSECTXS.A to build the corresponding BSTADMIN commands. Output of the procedure is the member DTSECVTX.A which contains the generated BSTADMIN commands.

Then execute the BSTADMIN program to a) process the commands in DTSECVTX.A and b) to PERFORM DATASPACE REFRESH.

To allow users to execute a transaction, they need to be connected to the defined group GROUP_{xx}.

Step 1: Execute REXX procedure DTSECVTX:

```
// JOB REXXPROC    CREATE BSTADMIN COMMANDS FOR TRANSACTIONS
// LIBDEF *,SEARCH=(PRD2.CONFIG,PRD1.BASE)
// EXEC REXX=DTSECVTX,PARM='INFILE=IJSYSRS.SYSLIB.DTSECTXS.A      *
      OUTFILE=PRD2.CONFIG.DTSECVTX.A'
```

You now have the BSTADMIN commands corresponding to DTSECTXN.A in member DTSECVTX.A.

The keys as defined in DTSECVTX are mapped one to one to GROUPS.

Example:

```
DTSECTXN NAME=CWXN,TRANSEC=(1)
```

results in

```
ADD TCICSTRN 'CWXN' UACC(NONE)
PERMIT TCICSTRN 'CWXN' ID(GROUP01) ACCESS(READ)
```


In the above example the resource class TCICSTRN contains a record 'CWXN' for transaction CWXN (through ADD). PERMIT allows GROUP01 to access transaction CWXN.

Step 2: Update the BSM Control File

```
// JOB UPDATE TRANSACTION SECURITY
// EXEC BSTADMIN
* $$ SLI MEM=DTSECVTX.A,S=PRD2.CONFIG
/*
// EXEC BSTADMIN
PERFORM DATASPACE REFRESH
/ &
```

Step 3: Add users to GROUPxx

Only users connected to GROUPxx are allowed to execute a transaction. You can use the IUI dialog 2-8-2 and OPTION 6 = USER LIST to add users.

With the example above, you have to connect users to GROUP01 in order to execute CWXN.

8.1.9 Reference Material and further information:

- **z/VSE Administration**
- **z/VSE Planning**
- **CICS Security Guide**
- **Hints and Tips for z/VSE 6.1**
(Hints and Tips for the z/VSE 6.2 does no longer contain references to DTSECTXN).

9 Task: VSE/POWER Migration

9.1 Migration of VSE/POWER Spool Files during FSU

Before you start FSU, it is recommended to do a POFFLOAD BACKUP to save your current VSE/POWER spool files.

The migration of VSE/POWER spool files to the new release level is performed automatically during FSU:

During stage 2 of FSU the following message is issued

```
1Q0HD IF SPOOL FILE MIGRATION TO VxRy IS INTENDED REPLY 'YES',  
ELSE 'NO'
```

Enter 'YES' to have the spool files migrated.

In case your system is started usually with security set on, the following message is shown:

```
1QFFD VSE/POWER WARMSTART AND VSE ACCESS CONTROL NOT ACTIVATED  
(SEC=NO). DO YOU WISH TO CONTINUE? (YES/NO)
```

Please enter 'YES' to continue. If you enter 'NO', the system will stop.

The migration of the spool files is not reversible.

If you did not save the spool files you may enter 'NO' and IPL from DOSRES to do so.

When entering 'YES', FSU continues. In case of any errors which require a restart (IPL) from DOSRES, a VSE/POWER cold start has to be performed and the spool files have to be reloaded using POFFLOAD LOAD | SELECT.

9.2 Migration of VSE/POWER Spool Files after Initial Installation

Two possibilities are outlined how spool files can be migrated from a source to a target system which was installed using initial installation.

If you are migrating from a release prior to VSE/ESA 2.4 you have to use POFFLOAD.

9.2.1 Using POFFLOAD

Shutdown your source system, except VSE/POWER.

Do a POFFLOAD BACKUP,ALL of your spool files. You can use either a real or a virtual tape.

On your target system:

- Ensure that your VSE/POWER queue and data files are large enough.
- Use POFFLOAD LOAD|SELECT to restore your spool files. To avoid duplicate entries or back level jobs, restore only required files.

9.2.2 Using a separate disk

If you have your spool files on a separate disk:

- Do a POFFLOAD BACKUP,ALL of your spool files on the target system for a later restore if required.
- Do a POFFLOAD BACKUP,ALL of your spool files on the source system for safety reasons, if you should have to go back to your source system.

- Adapt the DLBL, EXTENT, and ASSGN statements for the VSE/POWER files IJAFILE, IJQFILE and IJDFILE in the procedures STDLABEL and DTRPOWER on your target system
- Add the disk to your IPL procedure.
- Shutdown your source system.
- Shutdown your target system.
- IPL your target system to have the changed procedures active.
- VSE/POWER issues message:
1Q0HD IF SPOOL FILE MIGRATION TO VxRy IS INTENDED REPLY 'YES',
ELSE 'NO'
- Enter 'YES' to migrate the spool files.
- Once the spool files have been migrated, do not use them any longer on your source system.

Note:

If you are migrating from a release prior to VSE/ESA 2.4 you have to use POFFLOAD.

9.3 Further VSE/POWER Migration Tasks

Regenerate your VSE/POWER start-up phase, network definition table and any VSE/POWER exits you have.

If you start VSE/POWER with a start-up phase from a previous release, VSE/POWER displays message 1Q0GA.

9.3.1 Reference Material

Hints and Tips, chapter VSE/POWER

10 CICS TS for z/VSE - Migration Considerations

10.1 Migration from CICS TS for z/VSE V2.1 (and z/VSE V6.1)

z/VSE V6.2 is delivered with CICS Transaction Server for z/VSE V2.2 (CICS TS for z/VSE V2.2).

- CICS TS for z/VSE V2.2 is the only CICS release that can be used with z/VSE V6.2
- CICS TS for z/VSE V2.2 replaces CICS TS for z/VSE V2.1.
- CICS TS for z/VSE V2.2 replaces CICS TS for VSE/ESA V1.1.1
- All IBM-supplied CICS programs and tables are built with the CICS TS for z/VSE V2.2 level.
 - You can upgrade to z/VSE V6.2 via initial installation or FSU from z/VSE V6.1.
- With CICS TS for z/VSE V2.2 no control blocks were changed, that might be used by user or vendor applications. That is your application programs will run unchanged on CICS TS for z/VSE V2.2.

For details see the manual **CICS Transaction Server for z/VSE Enhancements Guide**

10.2 Migration from CICS TS for VSE/ESA 1.1.1 (z/VSE 5.2 or older)

- An initial installation is required (either of z/VSE 6.1 or z/VSE 6.2).
- With CICS TS for z/VSE V2.1, internal CICS control blocks were changed. If you use internal CICS control blocks within your application programs it is recommended to reassemble these application programs.
- Contact also your vendors, if there are dependencies to CICS TS for z/VSE V2.1.

Note:

z/VSE V6.1 is delivered with CICS Transaction Server for z/VSE V2.1 (CICS TS for z/VSE V2.1).

- CICS TS for z/VSE V2.1 is the only CICS release that can be used with z/VSE V6.1.
- CICS TS for z/VSE V2.1 replaces CICS TS for VSE/ESA V1.1.1.
- CICS TS for VSE/ESA can no longer be used with z/VSE 6.1, and later.

For details see the manual **CICS Transaction Server for z/VSE Enhancements Guide**.

10.3 Changes with CICS TS for z/VSE V2.2

There are changes with CICS TS for z/VSE V2.2 that need to be considered when upgrading both from CICS TS for VSE/ESA and CICS TS for z/VSE V2.1.

Two of them, 'CICS tables (DFHSIT)' and 'TCPIPSERVICE' are outlined below. For completeness, see the manual **CICS Transaction Server for z/VSE Enhancements Guide**.

10.3.1 CICS tables (DFHSIT)

If you use own DFHSIT tables, you need to reassemble and relink these tables. Otherwise CICS won't come up.

It is recommended to also reassemble and relink other CICS tables.

10.3.2 EXEC DFHCSDUP,SIZE=

The size of the phase DFHCSDUP has increased. It is now more than 300K. So jobs with an 'EXEC DFHCSDUP,SIZE=' might fail if the specified SIZE value is too small. Correct your jobs and use SIZE=500K.

See also 'DB2 and DFHCSDUP' on page 26.

10.3.3 TCPIP SERVICE

With CICS TS for z/VSE 2.2 new attributes were added to the TCPIP SERVICE.

When upgrading to CICS TS for z/VSE 2.2 both using initial installation as well as FSU:

- All TCPIP SERVICE definitions must be recreated.
- Otherwise the install of a TCPIP SERVICE will fail with message DFHAM4912E.

10.3.4 Additional Storage Requirements for CICS Web Support (CWS)

With CICS TS for z/VSE V2.2, CWS was upgraded to HTTP/1.1.

CWS uses by default the HTTP/1.1 protocol if this is supported by the web application. This means that connections are persistent per default and require additional EDSA storage.

10.4 Migration from CICS/VSE V2.3

- End of service of CICS/VSE V2.3 is effective since October 31, 2012.
- Starting with z/VSE V5, CICS/VSE V2.3 can no longer be used with z/VSE.
- Regarding migration from CICS/VSE V2.3 to CICS TS please refer additionally to:
 - CICS Migration Guide
 - Redbook Migration to VSE/ESA 2.4 and CICS Transaction Server for VSE/ESA 1.1.
- If possible, a customer should migrate to CICS TS V1.1 on his current system. This allows to run both CICS/VSE and CICS TS V1.1 in parallel. Furthermore, if a problem should be encountered, it is for sure related to the CICS/VSE to CICS TS migration and not any other system changes that were introduced with a new z/VSE release level (for example VSE/VSAM changes).

10.4.1 Reference Material

Hints and Tips for z/VSE 6.1.

10.5 Migrate RPG II online application to CICS TS for z/VSE

Chapter “Migrate RPG II online applications to CICS TS for z/VSE” describes how RPG II online applications used with either CICS/VSE or CICS TS for VSE/ESA can be migrated to CICS TS for z/VSE.

11 ACF/VTAM V4.2 and 31-bit I/O Buffer support

With the VTAM 31-bit I/O Buffer support, I/O buffers and I/O CTC buffers can be allocated in the 31-bit System GETVIS area through the VTAM startup option IOBUF31=YES. If initial installation is performed, the VTAM 31-bit I/O Buffer support is enabled.

For Local non-SNA terminals, like terminals used under z/VM, moving I/O buffers in 31-bit storage requires about 4 copy blocks for each terminal. Depending on the numbers of local non-SNA terminals the default number of copy blocks, which is 1500, might not be sufficient. It can be changed using the IPL SYS BUFSIZE command.

The SIR command shows the actual usage of the copy blocks. Depending on your environment, ensure that you have enough copy blocks available. Otherwise the startup of VTAM might fail.

12 Task: LE z/VSE Migration

The following information is directed mainly at Language Environment (LE) z/VSE migrations being performed from z/VSE V4.2 systems to subsequent releases and versions. Information is specific to LE z/VSE customizations and related z/VSE system settings needing to be considered or verified prior to or subsequent to a z/VSE system migration. This information is not intended for application or language source code migration projects.

12.1 Migrating from previous z/VSE and LE z/VSE levels

LE z/VSE is built on the premise "link low", "run high" for user applications. This means user applications can be link-edited with one particular LE z/VSE level and can then be executed on the same or a higher level of LE/VSE. The reverse is not supported.

This chapter describes, in general, tasks to be performed when migrating to a newer z/VSE and thus LE z/VSE release. Not everything is able to be covered here so this document should be treated as complimentary to the generally available LE/VSE Migration Guide. This also applies to the specific language migration guides – COBOL for VSE/ESA Migration Guide, C for VSE/ESA Migration Guide, and the PL/I for VSE/ESA Migration Guide. For ILC (inter-language communication) applications also refer to the manual **LE z/VSE Writing Inter-language Communication Applications** and for Assembler applications the manual **LE z/VSE Programming Guide**.

12.2 LE z/VSE Migration Preparation

The LE z/VSE updates documented in the z/VSE Release Guide or the z/VSE Program Directory should be checked first for any important notices or changes that may need to be either performed prior to the upgrade or subsequent to the upgrade. Information on changes that may require re-customization, application changes or changes to default settings are important to note early so that later problem diagnosis will be easier.

Review any documented new features or changes that may affect your system taking into consideration any customization or tailoring you may have already performed.

12.3 LE z/VSE Run-Time Option Customization Migration

Ensure you have your current JCL/source members for any tailoring/customization work performed earlier on your current system. Specifically any run-time option customization JCL, active run-time exits or LIOCS module tailoring. These changes will need to be reviewed and then re-applied to the upgraded system using the new versions supplied with your new system. Earlier customization JCL or jobs should not be executed "as-is" without first reviewing the same customization member supplied on the new system. It is always preferable to use the upgraded systems customization JCL as a basis for changes rather than propagating tailored old

JCL/settings from potentially a much older system. If your system uses the supplied default run-time options for both the BATCH and CICS environments there is no need to perform any run-time option customization tasks. The same applies if you do not have any run-time exits or LIOCS modules tailored.

If LE z/VSE happens to find any default run-time option modules from older systems, an ABEND U4092 RSN42 will be issued in BATCH while under CICS TS a return code of 11060 will be reported at CICS initialization time.

While LE z/VSE strives to provide legacy application support, be prepared to run tests on applications that rely upon such legacy support. Include any applicable applications from both your BATCH and CICS environment in addition to any database/sort products used.

12.4 ALL31(ON) Usage

If there are no legacy or AMODE(24) applications left in your system then consider using ALL31(ON) as your BATCH default setting. The LE z/VSE run-time is optimized towards applications executing in an ALL31(ON) environment. Remember to also change the STACK run-time option in accordance with the ALL31 run-time setting. If you are performing any re-compilation or re-link processes during your migration you could consider any “main” applications may also need to be link-edited as AMODE(31) rather than AMODE(ANY) to ensure invocation in the BATCH environment is initially AMODE(31) to support the ALL31(ON) setting. It is strongly recommended to set the appropriate compiler options and re-compile and link-edit affected applications to adjust the load-module (PHASE) AMODE rather than using a link-editor over-ride.

12.5 LE z/VSE CICS Considerations

12.5.1 LE z/VSE CICS-wide Run-Time Options

With each new z/VSE (and LE z/VSE) release, the default CICS run-time options, supplied with your system, are reviewed and improved if needed. The same can be said for BATCH also. However, the storage usage is more sensitive in the CICS environment so special attention needs to be paid to any changes made. Rather than just saying “well my old options worked fine on the old system” start with the supplied defaults and JCL. Minor, but important, changes may have been made to these members that using your old options and customization job could result in reduce storage and/or performance benefits, ABENDs, or even failures. After reviewing the default values and using the supplied JCL member make your desired changes. This customization JCL should now be used as a basis for any future LE z/VSE run-time option customizations performed on this system.

Note:

LE CICS-wide run-time options are specified in phase CEECOPT, batch run-time options are specified in phase CEEDOPT. Both phases are located in sublibrary PRD2.SCEEBASE with system provided defaults.

If you want to change the system provided defaults, it is recommended to catalog the modified phase(s) in PRD2. CONFIG.

You can find skeletons CEECOPT and CEEDOPT in ICCF library 62.

12.5.2 CICS System Settings

It is recommended that you set the CICS System Initialization (SIT) parameter RUWAPool=YES. This allows CICS and LE z/VSE to more efficiently manage the storage usage of LE-enabled CICS applications.

See the CICS TS Performance Guide for more information.

12.5.3 BMS Users Considerations

Users of Full BMS with LE z/VSE applications that experience intermittent map display corruption may find that using the following STORAGE run-time option setting can help alleviate the problem:

```
STORAGE=(00,00,CLEAR,0K)
```

As this will create a minor storage management performance degradation it is recommended this option be set only in applications that specifically require it.

12.6 Base System Included APARs

Review any LE z/VSE APAR documentation for those APARs included in your new systems base installation. If any object modules have been updated that are included at link-edit time of your applications then these applications will require re-"link-editing" to ensure your applications benefit from the resolution provided.

12.7 LE z/VSE Attention Routine Interface

It is strongly recommended that you do not disable or de-activate the provided LE z/VSE attention routine interface. This is currently activated via job CEEWARC which is automatically available on your systems VSE/POWER reader queue and is released via a

command in the supplied USERBG.PROC system start-up procedure. Should you need to tailor the USERBG.PROC remember not to remove the execution of the CEEWARC job.

The attention routine provides valuable information to IBM service representatives should you experience a problem with one of your LE z/VSE applications. You can also use this interface to extract your current LE z/VSE configuration information should you require it. See the full documentation on the attention routine feature in the LE z/VSE Debugging Guide, section “Using Attention Routine Interface Commands”.

12.8 LE z/VSE SVA Usage

Check your SVA usage and what you currently have loaded for LE z/VSE. If you have no LE z/VSE SVA modules loaded consider adding the \$SVACEE load list. For the attention routine support the module CEL4CMDR is required to be resident in the SVA always. See the LE z/VSE Customization Guide for more details.

12.9 Language Specific Migration Preparation

For each language your system uses you need to consider any possible migration or re-customization work.

12.9.1 LE/COBOL Run-Time Migration Preparation

This section is not intended to be used for COBOL migrations from earlier compilers. The COBOL for VSE/ESA Migration Guide is a comprehensive guide documenting migration procedures required for upgrading from DOS/VS COBOL or VS/COBOL II environments to COBOL for VSE/ESA.

CICS Considerations - the supplied CICS-wide default setting for ALL31 is ON. For systems that do not use any legacy (AMODE(24)) applications in the CICS environment this is the preferred setting to maximize both CPU and storage utilization performance. However if you have some older legacy applications that are not invoked using CICS services (for example XCTL, LINK) but are dynamically called then use of a CEEUOPT in the “main” routine invoking these legacy applications should be considered to set ALL31(OFF) with the appropriate STACK run time option setting. Also see APAR PQ23382.

12.9.2 COBPACK Usage

If you have customized the supplied COBOL COBPACKs then this customization work will need to be reviewed and re-applied after your system upgrade. Take this opportunity to review the on-going requirement to customize the supplied COBOL COBPACKs.

12.9.3 LE/COBOL SVA Usage

Check your SVA usage and what you currently have loaded for LE/COBOL. If you have no LE/COBOL SVA modules loaded consider adding the minimal amount of SVA eligible modules to the SVA by using the \$SVAIGZM load list. If you have the available SVA storage there is the full SVA load-list available called \$SVAIGZ. See the LE z/VSE Customization Guide for more details.

12.9.4 LE/COBOL Side-File Exits

If you have activated the LE/COBOL side-file (SYSDEBUG) exits these will need to be migrated to the new system. Alternatively you should consider the need to continue using these exits as LE/COBOL, since z/VSE 3.1, will search the active // LIBDEF PHASE search chain looking for the relevant side-file. Grouping your side-files with the relevant load modules (in the same sub-library) will effectively remove the requirement for any side-file exit routine to provide re-direction information for the location of the side-file member.

12.9.5 LE/PLI Run-Time Migration Preparation

This section is not intended to be used for PL/I VSE migrations from the DOS/PLI compiler. The PL/I for VSE/ESA Migration Guide is a comprehensive guide that documents the migration procedures.

12.9.5.1 LE/PLI SVA Usage

Check your SVA usage and what you currently have loaded for LE/PLI. If you have no LE/PLI SVA modules loaded consider adding the minimal amount of SVA eligible modules to the SVA by using the \$SVAIBMM load list. If you have the available SVA storage there is the full SVA load-list available called \$SVAIBM. See the **LE z/VSE Customization Guide** for more details.

12.9.5.2 Run-Time Options Unique to PL/I Applications

If not done already, carefully review the default or tailored run-time options being set for your

new system. Specifically run-time options effecting PL/I application behaviour. Look carefully at the STORAGE run-time option setting. Values set to force storage initialization or storage releasing are a CPU overhead. If all your BATCH PL/I applications have been migrated correctly and perform their own stack (automatic storage) variable initialization processing then there is no requirement for LE z/VSE to perform this function. Condition handling is another area that if your applications are not stacking conditions then the DEPTHCONDLMT run-time option value can be reviewed to something more applicable to your application design. PL/I applications that experience frequent truncation or fixed-overflow (FOFL) conditions will perform worse than applications that do not experience these conditions.

12.9.5.3 LE/PLI CICS Considerations

Under CICS TS for z/VSE, it is recommended that the CICS-wide default STORAGE runtime option be set to initialize stack storage when running PL/I VSE applications. The sub-option to perform this function is CLEAR and would look something like the following:

```
STORAGE=(00,NONE,CLEAR,0K)
```

As this can result in a minor CPU performance overhead it is recommended this option only be set in applications that require it by using the PLIXOPT varying string.

The supplied CICS-wide default setting for ALL31 is ON. For systems that do not use any legacy or AMODE(24) applications in the CICS system this is the preferred setting to maximize both CPU and storage utilization performance. However if you have some older legacy or AMODE(24) applications that are not invoked using CICS services (for example XCTL, LINK) but are dynamically called then use of a PLIXOPT in the “main” routine invoking these legacy applications should be considered to set ALL31(OFF) with the appropriate STACK run time option setting. Also see APAR PQ23382.

12.9.6 LE/C Run-Time Migration Preparation

This section is not intended to be used for C/VSE application migrations from the C/370 for VSE compiler. The C for VSE/ESA Migration Guide is a comprehensive guide that documents the migration procedures.

12.9.6.1 LE/C Run-Time and z/VSE System Requirements

It is strongly recommended you do not remove the LE/C run-time component from your system even if you do not have any C/VSE or LE/C applications. Many z/VSE sub-systems and low-level functions make use of the LE/C run-time and will cease to function if it is removed.

12.9.6.2 LE/C SVA Usage

Check your SVA usage and what you currently have loaded for LE/C. If you have no LE/C SVA

modules loaded it is strongly recommended you consider adding the minimal amount of SVA eligible modules to the SVA by using the \$SVAEDCM load list. If you have the available SVA storage there is the full SVA load-list available called \$SVAEDC. See the LE z/VSE Customization Guide for more details.

12.9.6.3 LE/C Run-Time Locale Time Information

If you have tailored your system to use a specific C locale then keep the source changes (EDCLOCI) you have already performed. After your new system is available extract the tailoring JCL member EDCLLOCL.Z from the LE z/VSE installation library and then insert your earlier system's configuration settings (EDCLOCI) in the appropriate place. Remember to check the relevant documentation (e.g. LE z/VSE Customization Guide) for any changes or enhancements that may affect your locale configuration.

12.9.7 LE z/VSE Conforming Assembler Migrations

Check the z/VSE Release guide for any details on changes, improvements or fixes being made to any of the LE z/VSE assembler macros (for example CEEENTRY, CEETERM – see the LE z/VSE Programming Guide for a comprehensive list). If there is no mention of any changes another option is to review the macro's themselves resident in the LE z/VSE installation library. Review the change history information and corresponding dates to see if there are any changes that have been made since your LE z/VSE conforming assembler programs were last assembled. If there are any fixes that match your applications configuration or any enhancements you would like to take advantage of then you will need to arrange for your LE z/VSE conforming assembler programs to be re-assembled and if appropriate link-edited on the new system.

12.9.8 LE z/VSE Conforming Assembler CICS Considerations

If you are using the LE z/VSE assembler “main” under CICS support it is recommended that you use the following run-time options as your CICS-wide default options:

```
STORAGE=(NONE,NONE,CLEAR,0K)
```

With CICS TS for z/VSE V2.2 a new translator option LEASM causes Language Environment function to be used to set up the program's environment.

12.9.9 Reference Material

- **LE/VSE Migration Guide**
- **COBOL for VSE/ESA Migration Guide**
- **C for VSE/ESA Migration Guide**
- **PL/I for VSE/ESA Migration Guide**

13 VSE Connectors Workstation Components

If you are using any of the VSE Connectors workstation components, you should also update them to the latest level.

New features can only be used, if both, the workstation parts and the server (z/VSE system) are on the newest level.

It is required to update the VSE Connector Client to the newest level on each workstation where you use it. If you miss to update the VSE Connector Client, the client applications will not be able to connect to a server (z/VSE system) with a new z/VSE release. For compatibility reasons you can use an updated client with an older z/VSE version, but not vice versa. However, new features can only be used if both the VSE Connector Client and the server (z/VSE system) are on the newest level.

For other components an update is recommended but not required.

To update the workstation components, you can either download the latest version from the z/VSE download web page (<http://www.ibm.com/systems/z/os/zvse/downloads/>), or you install the "VSE Connectors Workstation Code" component from the Extended Base Tape and then download the appropriate WBOOK to your workstation. Rename the WBOOK to .zip and extract it. To update an existing installation, choose the existing installation directory in the graphical installer. The installer will then update the existing installation by first uninstalling the existing one, and then re-installing the new one. You may get asked if you want to keep modified files during the update process.

For more details about the VSE connectors, please see the z/VSE e-business Connectors, User's Guide.

14 z/VSE Fast Path to Linux on z Systems (IBM Z) Function

If you are using the Fast Path to Linux on System z function (also called Linux Fast Path or LFP) you should also upgrade the Linux Fast Path Daemon (LFPD) on all your Linux on System z installations. To benefit from new features, both the z/VSE system and the LFPD have to be on the latest level.

For compatibility reasons you can use an upgraded z/VSE system with an older LFPD or an upgraded LFPD with an older z/VSE version. During handshaking, both sides detect each other's version.

To update the Linux Fast Path Daemon, you can:

- Either download the latest version from the z/VSE download web page (<http://www.ibm.com/systems/z/os/zvse/downloads/>)
- Or install the "VSE Connectors Workstation Code" component from the Extended Base Tape and then download the WBOOK IJBLFPLX.W to your workstation. Rename the WBOOK to .zip and extract it. Use the RPM command to install (`rpm -i`) or update (`rpm -u`) the package.

For more details about the z/VSE Fast Path to Linux on System z, please refer to the manual z/VSE TCP/IP Support.

14.1 z/VSE Network Appliance

When you are on a z13 or later, you can use the z/VSE Network Appliance. The z/VSE Network Appliance is an integrated solution providing TCP/IP stack functionality. TCP/IP applications running on z/VSE may use LFP to communicate via the z/VSE Network Appliance.

15 Performance Considerations

15.1 Version / Release overhead

A new z/VSE release or version usually has a slightly higher overhead compared to the previous release.

Release overhead is caused by an increased path length due to new or changed code paths of the system.

The release overhead depends on the usage of the system and the workload (for example I/O intensive, usage of system and vendor code, etc.).

You can use the zSoftCap tool to estimate the amount of release overhead:

<http://www.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS268>

For more details about z/VSE Performance, please refer to:

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

15.2 Collect Reference Measurement Data

When you perform a hardware and/or software upgrade, it is strongly recommended to have performance measurement data available from the original system.

This will allow you to compare your performance measurement data when running on the new system with the data from the old system.

For more information about how to collect the data and what to collect see Performance Analysis Process on page 49.

15.3 Performance Analysis Process

Whenever a performance problem is encountered, a structured and logical analysis is important to solve the problem as fast as possible. To this end, you should follow the outline provided on the following pages and ask the following questions:

- Where in the system does the problem occur?
- What has been changed (if the problem did not occur before)?
- When and with which application does the problem occur?

- What actions do I need to take for I/O related problems?

In order to analyze a performance problem you will need to have meaningful performance measurement data available.

When you perform a hardware or software migration, it is strongly recommended to keep a good set of performance measurement data taken on the original system before the migration. The performance measurement data should include at least CPU utilization measurements as well as I/O count and time measurements from a couple of weeks of a typical production workload. The measurement interval should be 5 minutes or less to have a reasonable granularity of the data. You should measure all related systems, all z/VM Guests (when running under z/VM), and all LPARs to have a complete picture of all related systems.

Having the measurement data allows you to compare the performance data from before and after the migration.

It is a good idea to keep the performance measurement data for an extended period of time when performing a migration, as performance problems may even be realized only after a longer time after the migration has been completed.

Different performance monitoring tools are available, either from IBM or from independent software vendors.

The following list contains several performance monitoring tools, however there might be additional tools provided by independent software vendors that we are not aware of:

- z/VM Performance Toolkit (when z/VSE runs under z/VM)
- Built-in commands: SIR, QUERY TD, SIR SMF, SIR MON, Job Accounting, MAP, GETVIS, and others.
- CICS provided tools: CICS Statistics, CEMT INQUIRE, and others.
- System Activity Dialogs of the z/VSE Interactive Interface
- CPUMON Tool
- Explore from, CA, Inc.
- TMON from Allen Systems Group, Inc
- zVPS from Velocity Software (when z/VSE runs under z/VM)

Where in the system does the problem occur?

1. For hardware and software related problems:

- Are the performance related ECs (Engineering Changes) and PTFs (Program Temporary Fixes) installed?

2. For microcode and software setup:

- Are the VM assists active?
- Are the VM guest parameters properly set?
- Are all traces switched off?
- Is DEBUG off?

3. For problems related to the system configuration:

- What is the CPU utilization?

- What is the paging rate?

4. For I/O related problems:

- Use performance monitoring tools for a detailed problem analysis.
- Is minidisk caching active?

What has been changed (if the problem did not occur before)?

Was there any change in the system, workload, or partition setup?

Has any new software release from IBM or from another supplier been installed?

- Which new release was installed?
- Do PTFs for this release exist?
- Can I temporarily deactivate the software or even remove it?
- Can I reproduce the problem?

When and with which application does the problem occur?

- Already in single thread?
- Only under heavy system load?
- Only when specific other applications are running?
- Which particular job step or transaction is affected?
- Did the problem exist before? If not, what has been changed?

What actions do I need to take for I/O related problems?

Did the number of I/Os increase compared to the former situation?

Did the duration of the I/Os increase?

Check the capacity guidelines for device and channel utilizations and the number of actuators and paths.

Consider that z/VSE supports dynamic I/O handling, which includes dynamic path select (DPS) and dynamic path reconnect (DPR).

Tune the software with regard to I/O as follows:

- Check the VSE/VSAM file definitions:
Use more or larger I/O buffers, especially for a z/VSE system with more private space.
- Are other disk device types used without re-checking the following?
The VSE/VSAM CI (control interval) sizes for data and index. The layout of the VSE/VSAM LSR buffers.
- Check your minidisk caching settings, and adjust if required.
- Increase the multiprogramming level (I/O concurrency). This can be done by using additional partitions.

Sizing a new z Systems server for use with z/VSE

When planning for a z Systems server upgrade, it is essential to perform proper system sizing and capacity planning.

Meaningful performance measurement data is required to perform capacity planning and sizing of new systems.

z/VSE Version (Release) and Hardware Upgrade

IBM and business partners provide a free of charge capacity planning study which is based on the zCP3000 tool.

When running under z/VM, it requires measurement data collected by the z/VM Performance Toolkit. When running in an LPAR image (without z/VM), it requires measurement data collected by the CPUMON Tool.

Please contact your business partner or your sales representative and ask for z/VSE Capacity Planning support.

16 Dropped Support

For reference this chapter summarizes the z/VSE support that was dropped.

16.1 Hardware Migration Configuration

Starting with z/VSE 5.2, z/VSE does no longer offer to migrate hardware, VTAM, and TCP/IP definitions during initial installation.

16.2 National Language Support (NLS)

- The German and Spanish national language versions of z/VSE have been dropped with z/VSE V4.1.
- The Kanji version was dropped with z/VSE V6.1.

Initial installation is required to upgrade from an NLS version to an English version of z/VSE.

16.3 Dropped Hardware

Starting with z/VSE 6.2, 3380 type disks and 3390 type disks in 3380 track compatibility mode are no longer supported as system disks. They are still supported as data disks.

16.4 Dropped Tape Delivery

Starting with z/VSE V6.2 physical tape delivery is dropped. The z/VSE system (and optional products) can be ordered on DVD or downloaded from the internet using Shop z.

16.5 Dropped Job Control Options

Starting with z/VSE 5.1, these options on the STDOPT and OPTION control statements were dropped and are rejected either with message

```
1U13D INVALID STATEMENT
```

```
// STDOPT OLDASSEM=NO  
// STDOPT OLDASSEM=YES  
// STDOPT EDECK=NO  
// STDOPT EDECK=YES  
// STDOPT FASTTR=NO
```

```
Or 1L65D INVALID OR INCOMPLETE OPERAND(S)
```

```
// OPTION EDECK
```

z/VSE Version (Release) and Hardware Upgrade

```
// OPTION NOEDECK  
// OPTION NOFASTTR  
// OPTION OLDASSEM  
// OPTION NOOLDASSEM
```

Before migrating to z/VSE 5.1 or later adapt your JCL and remove these options to avoid a failure of your jobs.