

VS03 Hard- & Software Migration mit z/VSE



August Madlener, IBM Deutschland RD GmbH



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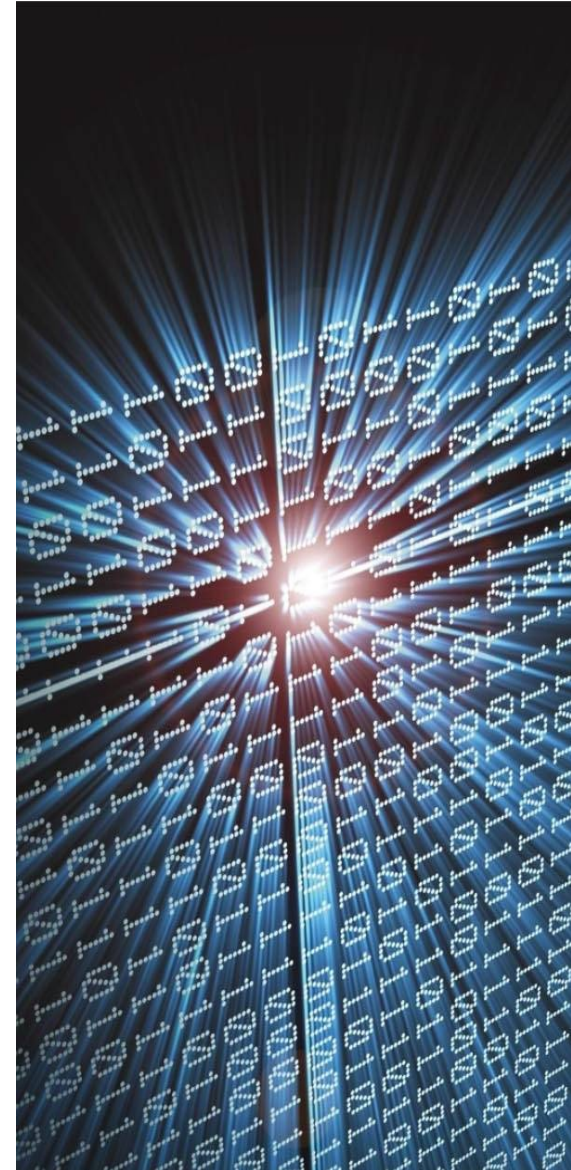
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Agenda

- Overview
- Hardware Upgrades, Migration
- Software Upgrade
 - Planning
 - FSU
 - Initial Install and Migration
- Activities after Migration
- Migration of Data



Hardware Upgrade

- Microcode Upgrade
 - z/VSE with the latest service level supports concurrent microcode upgrade for IBM tape and ECKD storage
 - z/VSE does not support concurrent microcode upgrade for Fibre-Channel-attached SCSI disks
 - Please consult your device documentation for details

- In general, it is recommended to shut down and restart after upgrade, especially for SCSI disks

- Recommendation 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 upgrade

Hardware – new Processor

- New processor if activated after software migration will cause overlap messages cause of new CPUID on
 - Page data set
 - Label area on old systems (no virtual disk)
- In case of a shared system, make sure CPUID is changed in in ASIPROC
 - Check DLF NCPU parameter is CPU is added in addition
- Consider turbo dispatcher threshold parameter if using multiple CPUs
- zBC12 requires update (PTF) for SCRT

You can find more here

<http://www.ibm.com/systems/z/os/zvse/about/status.html#server>

Hardware Upgrade – OSA Cards Some Experiences

- New with OSA Express 3 (OSAX3) and higher
- All OSA features can be configured in the IOCD as CHPID OSD
 - 1000BASE-T also supports type OSA, OSC and OSE
 - When used with CHPID type OSD (TCP/IP traffic) define it as
 DEFINE LINK,TYPE=OSAX,...
 - New cards have two ports per CHPID, to define port 1
 DEFINE LINK,TYPE=OSAX,DEV=(D00,D01),DATAPATH=D02,OSAPORT=1
 - For PTF numbers required for OSA/SF contact IBM
- OSA/SF is used to configure and load so called address table (OAT) for SNA (OSE)
 - IOCD: CHPID PCHID=1B0,PATH=(B0),TYPE=OSE,PART=(ZVSE,BRSPRD),SHARED
 - Configuration is done running IOACMD REXX and IOAMAIN
 - New cards OSAX4S and OSAX5S can be configured on HMC without OSA/SF

These are the OSA/SF configuration options:

	OSA/SF in HMC	OSA/SF with latest PTF
OSA Express3	No	Yes
OSA Express4S	Yes	Yes
OSA Express5S	Yes	No

Hardware Upgrade – Disks, Tapes

- FICON attachment
- Larger disk models
 - Plan carefully, VSAM catalogs need migration
 - Consider BIG DASD and FAT DASD
- SCSI disks
 - There are some restrictions, no stand alone dump on SCSI disks
- Tapes
 - Old tapes are most likely ESCON
 - Tapeless system only to a certain degree using VTAPE
 - SDAID, Standalone environment, remote VTAPE requires network
- VTS size limits, can be changed through hardware upgrade
- Multi Volume support
 - Migrate old tape volumes to new tape libraries
- Encryption

You can find more here

<http://www.ibm.com/systems/z/os/zvse/about/status.html#storage>

Tape Libraries

Tape Libraries see also <http://www.redbooks.ibm.com/abstracts/sg247712.html>

- IOCDs
 - Sample TS77xx

```
CNTLUNIT CUNUMBR=0850,PATH=(E2,60),UNIT=3490,UNITADD=((00,02))
```

```
IODEVICE ADDRESS=(0850,2),CUNUMBR=(0850),UNITADD=00,UNIT=3490,      x
```

```
STADET=Y
```

- Sample TS55xx

```
CNTLUNIT CUNUMBR=0890,PATH=(77,73),UNIT=3590,UNITADD=((00,02))
```

```
IODEVICE ADDRESS=(0890,2),CUNUMBR=(0890),UNITADD=00,UNIT=3590,      x
```

```
STADET=Y
```

- VSE configuration
 - TS7700 has virtual 3490E drives, ADD as 3490E.
 - TS3500 is has real 3590/3592 drives, ADD a TPA or TPAxxx
 - VTS usage
 - LIBSERV command interface
- Vendor software
 - VTS support, multi-volume support



Storage, System Layout

- Verify selected Environment, for new Installation consider Environment C
- NOPDS, optimize VSIZE to fit/use available storage
- Partition allocation/size
- More tasks
- Check VTAM IOBUF31
 - Verify copy block usage
- SVA layout
 - Tuned to a low number of unused storage
 - LISTDIR SDL for PSIZE
 - GETVIS SVA
 - Optimize SVA below
 - Increased PSIZE above for Environment B and C
- Check available DSPACE



Planning System Layout - Things that Should not be Changed

- Don't change library structure – IJSYSRS, PRD1, PRD2, SYSDUMP
- Don't change catalog layout, especially storage for master and user catalog VSESP.USER.CATALOG (VSESPUC)
- Control files IESCNTL and BSTCNTL must be unique in the system and accessible by BSM (FB) and each CICS with IUI (DBDCCICS and PRODCICS)
- Files should not be shared between VSE systems
- Especially BSTCNTL do not copy via VSAM REPRO services, use logical backup/restore via SKBSTSAV in ICCF 59
- It is not recommended to change allocation of IJSYSRS and IJSYSR1
- Use STDLABEL procedure to implement your DLBLs (BAM), STDLABUP and IESVCLUP program for VSAM DLBLs, STDLABUS for user labels
- Do not change volids DOSRES and SYSWK1
- History file, work history file, job manager file, text repository file, text repository work file and PTF file, if changed, reflect change in dialog 141 (Verify Location of Involved Serviced Files)

Software Upgrades

- Optional Products
- Extended Base Products
 - Remove old products of previous releases using provided delete jobs
- Vendor Products
 - Most likely this products need fixes to support a new release of VSE
 - Special care with external security manager like Topsecret
 - Make sure you have all service available before you start the upgrade
 - In case of an Initial Installation, all products have to be (re-)installed
- FSU
- Initial Installation
- PSP and RSL on top

Test and Fallback

- Test LPAR or VM Guest
 - Can Data be shared or is test data required
 - Application test
 - Verify data and eventually reorganize data
 - Verify system layout, consider performance
- Plan for Final Cutover
- Backup
 - Backup of most recent data
 - FSU optionally takes backup (stand alone) libraries and DTSFILE
 - VSAM catalogs (IDCAMS flashcopy)
 - System volumes stand alone FCOPY or DDR (VSE shut down)
 - PPRC
- Fallback
 - Plan for a fast and effective way to switch back
 - Depending on backup solution
 - If you have to switch back from z/VSE 5.1 to an older release, please consult IBM

Required Backups

- Physical Backups (FCOPY, SNAPCOPY)
 - use IDCAMS for VSAM - Consistency
 - System disks (DOSRES, SYSWK1) stand alone or while system is down
 - PPRC, SNAPCOPY, SA FCOPY, DDR
- Logical Backups
 - DTSFILE, IESCNTL, SKBSTSAV, LDAP File, Vendor data for security manager
 - VSAM Backup/Restore
 - POFFLOAD
 - Data Base backup
 - Library backups (FSU does backups IJSYSRS -SA, PRD1, PRD2)
 - User libraries
 - CSD File
 - User Data if BAM
 - FTP
- Be prepared for resetting to old system
 - Fastest way is certainly physical copies

Migration tasks

- FSU
 - Will update IBM provided parts like system base libraries and ICCF parts,
 - Update of CICS CSD file, Online Message Explanation file
 - FSU will keep all user data including user profiles and security definition, also installed products are kept
 - FSU using VSAM based VTAPE
 - After FSU Scan Device Information may help upgrading hardware configuration tables.
- Initial Install
 - Establishes just the z/VSE system
 - Additional products need to be installed
 - Access to user data needs to get established or data need to be imported to the new system
 - User profiles and security data need to get migrated from old system
 - Install from DVD
- No FSU possible if
 - From VSE/ESA 2.3 and earlier
 - Change of system disk to new disk model, for example 3390 Model 3 to Model 9 or ECKD to SCSI



Migration Tasks after FSU

- Update application Profiles and Selection panels
- Rework and recatalog
 - CICS tables
 - Startup procedures
 - LIBDEF procedures
 - VTAM books
 - LE/VSE runtime options CEEDOPT and CEECOPT
 - Establish stand alone dump facility
 - TCP/IP installed in PRD2.TCPIPC adjust LIBDEF Procedures, Connector startup job, VTAPE startup job, CICS Startup etc.
- Consider to move dump library to VSAM (SKDMPEXT)
- For production CICS consider SKCSDFC2 to update CSD file



Migration Tasks after Initial Installation - 1

- Install additional Products – Optional Products and Vendor Products
- Hardware configuration
- Configure startup procedures
- Rework and recatalog
 - CICS tables
 - Startup procedures
 - LIBDEF procedures
 - VTAM books
 - LE/VSE runtime options CEEDOPT and CEECOPT
 - TCP/IP installed in PRD2.TCPIPC adjust LIBDEF Procedures, Connector startup job, VTAPE startup job, CICS Startup etc.
- Establish stand alone dump facility
- Establish VSAM data, import catalogs etc.
- Reestablish POWER files
- CSD File – no good migration possible, best is using REPRO an SKCSDFIL or SKCSDFC2
- DTSFILE – restore user libraries only



Migration Tasks after Initial Installation - 2

- Migrate security definition
 - Run IESBLDUP to migrate User Profiles and Application/selection Profiles
 - This is only possible once, if a user is migrated, it will not be changed in a subsequent migration
 - Run SKBSTSAV to migrate BSTCNTL type definitions
 - In case of LDAP is used, use VSAM REPRO
 - All backups (IESCNTL, SKBSTSAV and LDAP file) have to be take at same time
- DB2 and/or DLI data base
- Reestablish customer/user applications

Above list is not in ordered sequence of tasks and does not show additional effort required for vendor products

Remarks on Security

- If updated using multiple times FSU, old DTSECTXN base security might still be used, migrate to new concept
 - Check using dialog 285, if migration still offered, it is recommended to first merge the security definition (PF 6), verify transactions and then use the migrate function.
 - Perform this prior to the upgrade
- If new concept is used, make sure you run
 - IESBLDUP to migrate user profiles then it is recommended to use PF6 GROUPS on dialog 211 User Profile Maintenance, copy generated job to primary and submit.
 - IESBLDUP will need a backup of IESCNTL (REPRO) and DTSTFILE
 - Use SKBSTSAV on old system and submit the generated job on new system
 - In case LDAP is used, copy LDAP files using VSAM repro.
 - All three things should be done in a timely short manner so that no users can change passwords etc.
- DTSECTAB (Batch Security) has to be recompiled – refer also to DTSECTRC in ICCF 59

Remarks on Backing up the system

- VSAM data and catalogs, use VSAM Backup/Restore or IDCAMS SNAPSHOT
 - Catalogs should be EXPORT-DISCONNECT and later on new system IMPORT-CONNECT
 - Please check definition of models used for workfiles on other disks than DOSRES or SYSWK1
- Non VSAM data can be copied using FCOPY, IXFP Flashcopy or DDR
- Copy of system disks
 - For the two system disk, make sure in case of DDR that the system is down
 - For FCOPY standalone-FCOPY is recommended for the system packs
 - If the master catalog or VSESPUC catalog have storage on disks other than DOSRES or SYSWK1, these volumes also have to be saved
- Migrating VSAM data and catalogs from 3390 Model 3 to higher, use backup, define catalog on new disk and restore on newly defined catalog.
- Consider a so called stand alone backup
 - BACKUP L=IJSYSRS ... REST=STANDALONE ...
- Security files IESCNTL needs REPRO with variable length blocked records, blocksize 4000, Backup of DTSTFILE, BSTCNTL logical backup using SKBSTSAV. LDAP also REPRO – no further specifics.

Test Considerations

If you decided for a test system

- Can this test system work with test data only?
- If real data is required, this means most likely sharing data with production
 - Be aware of the performance impact (SHR(4,4))
 - External lock file required
 - Setup of the shared environment is difficult
- Keep things like layout, startup procedures, workfiles etc. as close as possible the same as production
 - This might be used to copy this sandbox type system over to production as physical copy. This can avoid time consuming FSU on production
- To avoid data sharing, exchange and actualization of data can be done with FTP or similar tools.
- Consider also performance related parameters during test

Fallback and Backups

Fallback

- Is data changed in the meanwhile – on new system, new backup required?
- Recommended to EXPORT-DISCONNECT and IMPROT CONNECT after reset
- If disk type changed, going back gets difficult
- Restore system volumes
- Consider also backup of new system – faster resuming
- Keep in mind that the service level on the previous system may be very old compared to the new z/VSE. Usually the old system was not upgraded to the most up-to-date level of that release.

If a fallback is required after a migration, please contact IBM for known problems with such fallback situations

Planning for new Hardware

- New Processor
 - Performance consideration
 - New OSAX cards
 - New channel concept → FICON
 - Sizing of the new processor
- New disks
 - Consider consolidation to larger packs
 - Carefull with micro code updates, plan ahead
- New tape library, drop old tapes
 - Usage of VTAPE
 - Tapeless system?
 - Migration of tape data, multi-volume support
- Shared environment
 - CPU ID is new
- Storage, System layout
- Check Hardware PSP if appropriate

Checklist for FSU

- PRD2.SAVE contains all current startup procedures, label procedures, current DTSECTAB – especially procedures with same name as shipped procedures.
 - PRD2.SAVE should not contain phases that may have changed on new release. For example FCBs or UCBs phases are ok to save over to new system.
- PRD2.CONFIG contains all configurable files like CICS tables, TCPIP configuration, VTAM startup
- Check if own POWER phase and allocation – specify accordingly in FSU dialog. DTRPOWR.PROC refers to all POWER files? Run POWER generation at the end of Stage 1.
- Check *Program Directory* and *System Upgrade and Service* manual for further information
- Consider to establish startup with separate JCL procedures without activating vendor software, especially with external security manager

Check List Initial Installation

- Check if all startup procedures of previous release are available (ICCF, CMS, Volley ...)
- Under VM – prepare the new VSE guest (CMS profiles, storage, OSA etc.)
- Select large enough system packs
- Select correct environment
- Any Products of extended Base, Optional or Vendor Products – Updates
- Required backups available POFFLOAD, DTSUTIL, IESCNTL, SKBSTSAV, VSAM catalogs and data
- User application libraries, special setup LE or language definition, profiles
- Data base backup
- Other data like SDF libraries, MQ setup etc.
- Connectors used?

Questions ?



THANK YOU

Scan Device Information

This new function allows to actualize the currently available devices in the IUI Hardware Configuration Dialog

- First step is to run the scan using skeleton SKDVSCAN in ICCF library 59
 - This skeleton executes program DTRIBASE with parameter S which creates new hardware table DTR\$HDW1 in ICCF 50
- DTR\$HDW1 is input for the Dialog 246 'Create Report for Actual Devices'
 - A new list of devices is established named COMPLIST in primary library
 - The list contains scanned and defined (Hardware Configuration) devices and indicates mismatches.
- COMPLIST is input for dialogs 247 'Update Device Information for Actual Devices'
Available options are
 - Add Actual Devices to Hardware Table
 - Remove Not Actual Devices from Hardware Table
 - Update PCUUs for Actual Physical Devices
 - Update Device Names for Actual Devices
 - Update Device Down for Actual Devices

Scan Devices ADD Actual Devices - 1

ADM\$HDW1

HARDWARE UPDATE: ADD ACTUAL DEVICES

OPTIONS: 1=ADD

OPT	HARDWARE TABLE			ACTUAL INFORMATION			MISMATCHES
	VSE	PHYSICAL	DEVICE	VSE	PHYSICAL	DEVICE	A H P N D
	ADDR	ADDR	NAME	ADDR	ADDR	NAME	
_	00C	000C	2540R	00C	000C	2540R
_	00D	000D	2540P	00D	000D	2540P
_	00E	000E	1403	00E	000E	1403
_	02E	002E	PRT1	02E	002E	PRT1
_	144	0144	FBA				X.....
1				150	0150	FBA	..X.....
_	181	0181	TPA	181	0181	TPA
_	182	0182	3480	182	0182	3480
_	183	0183	TPA512	183	0183	TPAX..

POSITION NEAR ADDR == > ____

PF1=HELP

2=REDISPLAY 3=END

5=PROCESS

8=FORWARD

10=FOR ALL

Dump Memory Objects

Memory Objects are 64 bit addressable storage areas. Such areas can be dumped using standalone dump program (STDOPT SADMPSMO). Such stand alone dumps can be very large!

A more efficient method for debugging is to use new STDOPT MODUMP=YES or OPTION MODUMP. In this case a particular dump is generated dumping only a page of storage around the registers referring to the Memory Object.

The generated dumps can be processed using the Interactive Interface as described on next foils.

To print Memory Object dumps, onload them and also relate them to the partition dump that caused them, changes in INFOANA where required.

Memory Object Dumps Interactive Interface Dump Panels

- Memory Dumps can be identified by file name, starting with O.... they also are marked as Memory Object Dump

PRB\$IDH1

STORAGE DUMP MANAGEMENT

LIST OF SYSTEM MANAGED DUMPS

OPTIONS: 2 = PRINT SYMPTOMS 3 = PRINT DUMP 4 = ANALYZE SA DUMP
 5 = DELETE DUMP 8 = ON/OFFLOAD DUMP 9 = ANALYZE CICS DUMP
 7 = IN/OUT ARCHIVE FILTER= SYSDUMP ALL

OPT	-----DUMP NAME-----	RELATED DUMP	ON- LINE	DATE	TIME	TAPE LABEL	DSPACE MEMOBJ
—	SYSDUMP.BG.DBG00025	NONE	X	07/17/12	10:41:23		
—	SYSDUMP.BG.DBG00007	NONE	X	04/04/12	11:49:03		
—	SYSDUMP.BG.DF300001	NONE	X	05/04/10	09:48:54	111111	
—	SYSDUMP.BG.OF300001	NONE	X	05/04/10	09:48:54	111111	
—	SYSDUMP.F3.SF300001	NONE	X	05/04/10	09:48:54	111111	
—	SYSDUMP.F3.OF300001	NONE	X	05/04/10	09:48:54	111111	
—	SYSDUMP.BG.OBG00004	DELETED	X	07/25/12	11:46:52		MEMOBJ
—	SYSDUMP.F8.OBG00004	DELETED	X	07/25/12	11:46:52		MEMOBJ

PF1=HELP

2=REDISPLAY

3=END

5=PROCESS

6=ADD DUMP

PF7=BACKWARD

9=DEL ALL

Memory Object Dumps II Dump Panels – Possible Functions

- Print Symptoms
- Print All
- Print Selective
 - Related address is shifted by 3 hex digits, e.g. if entered from 100 to 744400 on the dialog, print job generated will have PRINT 0000000000100000 0000000744400FFF
- Onload/Offload from SA Dump / to tape
- Of course, delete dump, IN/OUT Archive
- For Memory Object dumps, Analyze SA Dump and Analyze CICS Dump options are not meaningful

Memory Object Dumps – Large Dumps

- Dump members in the dump library are limited to a size of about 2GB-16M
- Memory Object Dumps on a Stand Alone dump tape or disk can be much larger. Such dumps cannot be loaded into a VSE dump library.
- Onloading of large dumps – size larger than 1GB should be done using DITTO, see skeleton SKDMPLD in ICCF 59
- Please send in dumps of Memory Objects only on request.

Display VTOC sorted by VOLID

IESADMVOL1

DISPLAY VTOC

Page 1 of 1

OPTIONS: 1 = FREE SPACE 2 = FILES LIST 3 = VOLUME LAYOUT

OPT	VOLUME	ADDRESS	DEVICE	TYPE	SHARED	RESERVED
	DOSRES	230			3390	
-	DOSRES	410		FBA		
	IUI191	191			3390	
	MNT19D	19D			3390	
	MNT19E	19E			3390	
	MNT190	190			3390	
	SYSWK1	231			3390	
-	SYSWK1	411		FBA		
-	VDIDLA	FDF		FBAV		
	*****	144				

PF1=HELP

3=END

4=RETURN

11=SORT.ADDR 12=SORT.ID