

z/VSE Hints and Tips

With focus on hardware and release upgrade

2019 VM Workshop

Richmond, VA

June 27 – 29, 2019

<http://www.vmworkshop.org/2019.shtml>

Ingolf Salm - salm@de.ibm.com
IBM Germany

Ingolf's z/VSE blog: <https://www.ibm.com/developerworks/mydeveloperworks/blogs/vse/>

Table of Content

- Useful z/VSE system commands
- z/VSE and hardware upgrades
- z/VSE Service & Support
- News, z/VSE status, Documentation , ...

Some useful system commands, tools, system information, ...

* Internal Attention Routine commands/parameters and output may change dependent on system requirements.
The output can not be considered as an interface.

SIR – System Information Report

- Provides status information and monitoring capabilities
- Can help to identify
 - Latest service level
 - Processor configuration
 - system bottlenecks (resource shortage)
 - ...

```
sir ?
AR 0015      SIR  COMMAND HELP
AR 0015  SIR  (<RESET|SYS>)          RESET/DISPLAY SYSTEM INFORMATION
AR 0015  SIR  SMF(,VSE)=<ON|OFF|CUU>) SUBSYSTEM MEASUREMENT DATA
AR 0015  SIR  MON(=<<id|ON(,NOSYM)>|OFF>(option)) MONITORING DATA
AR 0015  SIR  MIH(,CUU)=<NNNNNN|ON|OFF>) DSPLY/ALTER MIH
AR 0015  SIR  VTAPBUF(=<nnnK|nnM>)  DISPLAY/ALTER VTAPE BUF-SIZE
AR 0015  SIR  LIBR                    DISPLAY LIBRARIAN INFORMATION
AR 0015  SIR  CHPID(=chpid)           DISPLAY CHPID INFORMATION
AR 0015  SIR  VENDOR                  DISPLAY VENDOR PRODUCT INF
AR 0015  SIR  CRWMSG(=<ON|OFF>)       DSPLY/ALTER CRW MSG-REPORTING
AR 0015  SIR  VMCF(=<ON|OFF>)        DSPLY/ALTER VMCF INTERFACE
AR 0015  SIR  PMRMON(=<ON|OFF>)      PAGE MANAGER MONITORING DATA
AR 0015 1140I  READY
```



SIR – System Information Report

```

SYSTEM:      z/VSE                z/VSE 6.2                TURBO (01)                USER:  SYS
TIME:       08:14:33

sir sys
AR 0015 CPUID          = 00222E6739078000
AR 0015 PROCESSOR     = IBM 3907-A01 02 (F2E6702)  LPAR = Z14                No. = 0034
AR 0015 CPUs          = 0001 (Ded.=0000 Shr.=0001) Cap. = 100%
AR 0015 PROC-MODE     = z/Arch(64-BIT)  IPL(016)                08:13:46                05/13/2019
AR 0015 SYSTEM        = z/VSE                6.2.0                    10/05/2017
AR 0015                VSE/AF                9.4.0                    DY47808                01/25/2019
AR 0015                VSE/POWER            9.4.0                    GA-LEVEL                12/01/2017
AR 0015 IPL-PROC      = $IPLESA                JCL-PROC = $$JCL
AR 0015 SUPVR         = $$A$SUPN                TURBO-DISPATCHER (B2) ACTIVE
AR 0015                HARDWARE COMPRESSION ENABLED
AR 0015 SEC. MGR.     = BASIC                SECURITY = ONLINE
AR 0015 1I40I        READY

```

```

SYSTEM:      z/VSE                z/VSE 6.2                TURBO (01)                USER:  SYS
VM USER ID:ZVSE                TIME:       08:19:49

sir sys
AR 0015 CPUID VM      = 00222E6739078000                VSE = FF22222239078000
AR 0015 PROCESSOR     = IBM 3907-A01 02 (F2E6702)  LPAR = Z14                No. = 0034
AR 0015 CPUs          = 0001 (Ded.=0000 Shr.=0001) Cap. = 100%
AR 0015 VM-SYSTEM     = z/VM                6.4.0                (0000)                USERID = ZVSE                VMCF = ON
AR 0015 CPUs          = 0001                Cap. = 100%
AR 0015 PROC-MODE     = z/Arch(64-BIT)  IPL(016)                08:19:19                05/13/2019
AR 0015 SYSTEM        = z/VSE                6.2.0                    10/05/2017
AR 0015                VSE/AF                9.4.0                    DY47808                01/25/2019
AR 0015                VSE/POWER            9.4.0                    GA-LEVEL                12/01/2017
AR 0015 IPL-PROC      = $IPLESA                JCL-PROC = $$JCL
AR 0015 SUPVR         = $$A$SUPN                TURBO-DISPATCHER (B2) ACTIVE
AR 0015                HARDWARE COMPRESSION ENABLED
AR 0015 SEC. MGR.     = BASIC                SECURITY = ONLINE
AR 0015 1I40I        READY

```

Tools to monitor your workload *

- **SIR SMF**

```

sir smf
AR 0015 DEVICE I/O-CNT QUEUED CONNECT DISCONN TOTAL
AR 0015 msec/SSCH msec/SSCH msec/SSCH msec/SSCH
AR 0015
AR 0015 46D 13605 0.169 0.317 0.002 0.489
AR 0015 46E 18855 0.146 0.177 0.005 0.329
AR 0015 970 40342 0.148 0.163 0.000 0.311
AR 0015 971 26089 0.150 0.166 0.000 0.317
AR 0015 972 12318 0.150 0.173 0.000 0.325
AR 0015 1140I READY

```

```

-----
sir smf,zhpf,178
(16.0) AR 0015 ZHPF I/O REQUEST STATISTICS
(16.1) AR 0015 CUU OVERALL ZHPF REJECTED
(16.2) AR 0015 178 BASE 29 0 0
(16.3) AR 0015 91FC ALIAS 0 0 0
(16.3) AR 0015 91FD ALIAS 0 0 0
(16.3) AR 0015 91FE ALIAS 0 0 0
(16.3) AR 0015 91FF ALIAS 1109 865 0

```

Tools to monitor your workload *

- **SIR PMRMON**

```

sir pmrmon
AR 0015          PAGE MANAGER MONITORING REPORT
AR 0015          (BASED ON A 0000:00:21.879 INTERVAL)
AR 0015 IPFQ 31-BIT      =          0      IPFQ 64-BIT      =          0
AR 0015  PSQ 31-BIT      =      484924      PSQ 64-BIT      =      6746514
AR 0015 PF EXCH TOTAL    =      16445      PF EXCH 31->64    =      16445
AR 0015 PF EXCH 64->31   =          0      PGFLT TOTAL      =      179742
AR 0015 PGFLT PMGR       =      176790      PGFLT USER       =          2950
AR 0015 PGFLT IMM P0 31  =          2      PGFLT IMM P0 64  =      16446
AR 0015 SELCT ON PSQ 31  =      16447      SELCT ON PSQ 64  =      88394
AR 0015 SELC R=1 MAX 31  =          3      SELC R=1 MAX 64  =          6
AR 0015 RECLAIMS         =          4193      NPSQ LOW         =          0
AR 0015 PGOUT I/O TOTAL  =      48444      PGIN I/O TOTAL   =          0
AR 0015 PGOUT I/O UNC.   =      13071      PGOUT I/O PRE.   =      35373
AR 0015 LRA PGM CHECK    =          0      TFIX 64-BIT FR   =          0
AR 0015 HWM MB FRM-64    =          0      HWM MB FRM-31    =          0
AR 0015 MB FRM TFIX RPL  =          0      MB FRM PGO RPL   =          4
AR 0015 1I40I  READY

```

Tools to monitor your workload *

- Monitored data can be retrieved from VSE Console

- **SIR MON** Attention Routine Command
 - Can help to analyze performance problems
 - Provides counters for
 - SVCs, Fast (107) SVCs and function codes
 - TD Service SVCs and function codes
 - MVS SVCs
 - Program Call codes
 - Bound conditions
 - TD performance (15 counters)

Tools to monitor your workload ...

- SIR MON Attention Routine Command ...

```

sir mon
AR 0015
                MONITORING REPORT
AR 0015          (BASED ON A 0000:00:16.680 INTERVAL)
AR 0015          SVC SUMMARY REPORT
AR 0015 EXCP      =          53  WAIT      =          38  SETIME      =          17
AR 0015 SVC-0D    =          57  SYSIO     =        37949  EXIT IT     =          34
AR 0015 SETIME    =          15  WAITM     =          18  COMREG      =          20
AR 0015 GETIME    =           1  POST      =          26  SVC-31      =          11
AR 0015 TTIMER    =           3  SVC-35    =          109  GETVIS      =          88
AR 0015 FREEVIS   =          69  CDLOAD    =           1  SECTVAL     =           5
AR 0015 FASTSVC   =         579  (UN)LOCK =           2  SVC-75      =          65
AR 0015 PRODID    =           2  SVC-83    =          200  SVC-84      =         147
AR 0015          SVC-X'6B' DETAIL REPORT
AR 0015    FC-02  =          25    FC-03  =          78    FC-06  =         109
AR 0015    FC-08  =          26    FC-09  =         100    FC-0A  =          76
AR 0015    FC-0D  =          16    FC-0E  =         192    FC-4F  =           1
AR 0015    FC-67  =           1    FC-73  =          60    FC-86  =          22
AR 0015    FC-90  =          62    FC-96  =           7    FC-9F  =         156
AR 0015    FC-B6  =          16
AR 0015          SVC-X'75' DETAIL REPORT
AR 0015    FC-98  =          57    FC-9C  =           8
AR 0015          MVS-SVC'S DETAIL REPORT
AR 0015 SVC-01    =          79  SVC-02    =          43  SVC-22    =           2
AR 0015 SVC-2E    =           2  SVC-2F    =          23  SVC-6B    =         141
AR 0015 SVC-77    =          57

```

Tools to monitor your workload

- **QUERY TD** – Query Turbo Dispatcher information, monitor CPU and elapsed time

```

SYSTEM:  LNXSALM1          z/VSE 6.2          TURBO (01)          USER:  SYS
VM USER ID:LNXSALM1          TIME:  12:57:34
query td,internal
AR 0015  CPU    STATUS    SPIN_TIME    NP_TIME  TOTAL_TIME  NP/TOT    DISP_ENTR
AR 0015   00    ACTIVE      0           434       568    0.764    229553
AR 0015   01    INACTIVE
AR 0015
AR 0015 TOTAL          0           434       568    0.764    229553
AR 0015
AR 0015                NP/TOT: 0.764          SPIN/(SPIN+TOT): 0.000
AR 0015 OVERALL UTILIZATION:  1%          NP UTILIZATION:  0%
AR 0015
AR 0015 CPU BALANCING:          NOT ACTIVATED
AR 0015
AR 0015 ELAPSED TIME SINCE LAST RESET:          50752
AR 0015 NUMBER OF SVC'S SINCE LAST RESET:      177848
AR 0015 1140I  READY

```

CPU Balancing

- When CPU balancing is activated, the z/VSE Turbo Dispatcher will only use CPUs required for the current workload
- Can be activated and deactivated via AR/JCL command
 - SYSDEF TD,INT=0 to deactivate, default
 - SYSDEF TD,INT=nn (=1..99) to activate and “nn” interval in seconds, after which the CPU utilization is inspected
- Threshold can be defined after which an additional CPU is activated
 - SYSDEF TD,THR=nn (10..99) in percent, default: 50
- CPU balancing via stop or quiesce process
 - SYSDEF TD,INT=nn,STOP - the stop process to be used
 - May provide performance improvements for z/VM guests (z/VM 5.4 or higher)
 - SYSDEF TD,INT=nn,STOPQ - the quiesce process to be use, default
- QUERY TD shows current settings
- CPU balancing may reduce multiprocessing overhead

CPU Balancing ...

- Retrieve CPU time values: QUERY TD

```

query td
AR 0015 CPU STATUS SPIN_TIME NP_TIME TOTAL_TIME NP/TOT
AR 0015 00 ACTIVE 0 63715 96636 0.659
AR 0015 01 ACTIVE 0 13668 22614 0.604
AR 0015 02 INACTIVE 210 23692 34187 0.693
AR 0015 -----
AR 0015 TOTAL 210 101075 153437 0.658
AR 0015
AR 0015 NP/TOT: 0.658 SPIN/(SPIN+TOT): 0.001
AR 0015 OVERALL UTILIZATION: 80% NP UTILIZATION: 53%
AR 0015
AR 0015 CPU BALANCING (STOP): INT: 9 SECONDS THR: 50%
AR 0015
AR 0015 ELAPSED TIME SINCE LAST RESET: 190550
AR 0015 1I40I READY

```

All values below in milliseconds:

TOTAL_TIME = CPU time used by workload
 NP_TIME = non-parallel CPU time, contained in TOTAL_TIME
 SPIN_TIME = CPU time needed to wait for a non-parallel work unit

NP/TOT = ratio NP_TIME / TOTAL_TIME = non-parallel share
 SPIN/(SPIN+TOT) = spin time ratio

z/VSE Downloads

<https://www.ibm.com/it-infrastructure/z/zvse-downloads>

IBM IT Infrastructure Marketplace Search

IBM Z Hardware OS Software Resources

It infrastructure > Z >

z/VSE downloads

Explore available downloads for the IBM z/VSE operating system

Products Downloads Events and education Resources

Latest updates

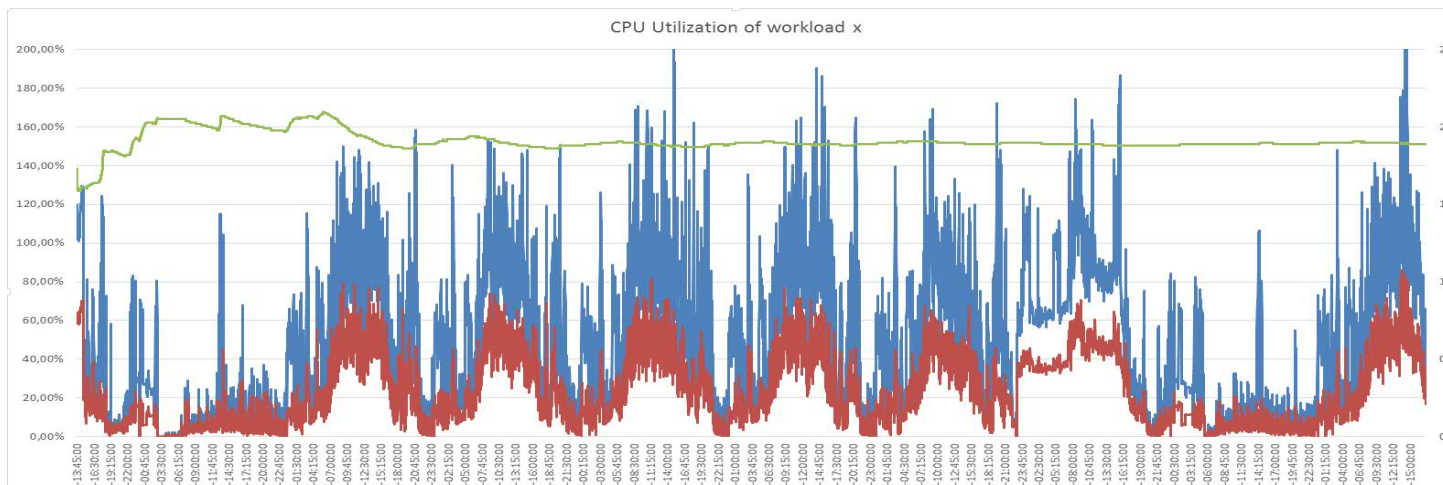
- VSE Virtual Tape Server (updated 02/2018 for APAR PI92815)
- VSAM Redirector Server (updated 12/2017 for z/VSE V6.2 GA)

Troubleshooting tools

z/VSE CPU Monitor Tool (as-is) Helps customers measure the CPU utilization of their z/VSE system over a period of time.	IP trace tool (as-is) Reads IP packet traces captured with TCP/IP for z/VSE and converts them into the CAP trace format.	Multi Instant Logic Analyzer4VSAM (as-is) Provides extent analysis, space map analysis, HALRBA/HUSRBA analysis, capacity analysis and data space analysis.
---	--	--

How to get the CPU utilization of a workload

- The z/VSE CPU monitoring tool (CPUMON) can be used to get the CPU utilization.
 - CPUMON can be downloaded from the z/VSE web pages.
<https://www.ibm.com/it-infrastructure/z/zvse-downloads>
 - CPUMON may run for a day or more and measures in e.g. minute intervals.
 - The monitored data can be loaded into a spreadsheet. A line chart can show workload peaks.
-
- Use CPUMON to understand the CPU requirements of your workload.
 - Run CPUMON before you upgrade your hardware or z/VSE release and save the data. You may compare that data with data from your new environment.



z/VSE Downloads ...

- To gather information before z/VSE upgrades
 - z/VSE CPU Monitor Tool
 - Measures the CPU utilization of their z/VSE system over a period of time.
 - Installed Software Report Tool
 - Generates a z/VSE Installed Software Report used for IBM ShopZ.
 - VSE Health Checker
 - System diagnosis utility to retrieve, display, and analyze performance relevant data from a z/VSE system.

- More z/VSE Downloads: <https://www.ibm.com/it-infrastructure/z/zvse-downloads>



z/VSE and hardware upgrades

Upgrade – General considerations

- Hardware upgrade can be any changes on the hardware infrastructure, such as processors, I/O, network, crypto cards, disks, ...
- Software upgrade can be upgrade to new SPE / release / version via Fast Service Upgrade (FSU) or initial installation
- Upgrade tasks:
 - Collect reference data
 - Backup your data and system
 - Obtain required software license and updates from vendors
- Recommendation: do not upgrade to a new processor and release in one step

Processor upgrade

Tasks before the upgrade

- Look for repeatable workloads
- Collect reference data
 - Measure and collect most important workload parameters
e.g. performance, I/O activity / timings, CPU / elapsed time, console logs, etc.
- Check the Preventive Service Planning (PSP) bucket
 - PSP describes service requirements for the new processor
e.g. PTFs IOCP, EREP, HLASM, z/VSE base PTFs for toleration and exploitation
 - PSP buckets: <http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp>
- Obtain new software licenses, if products have dependencies on the CPU id
- Install required z/VSE, z/VM and vendor PTFs

Collection of workload parameters

- Performance reports from performance monitors provided by vendors
- Console logs
- Network data
- z/VSE console commands
- Commands to get additional information
 - SIR - to get general information about the system
 - SIR SMF - to gather I/O information per device (I/O-count, timings - queued, connect, msec/ I/O)
 - SIR MON - to retrieve workload counters (SVCs, bound conditions, some internal counters, ...)
 - SYSDEF TD,RESETCNT - to reset counters
 - QUERY TD - to retrieve used CPU time, CPU utilization, non-parallel share, elapsed time, ...
 - Some of those commands are described in the z/VSE Hints and Tips book
https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/technical_articles_and_whitepapers.html

How to measure CPU / I/O performance

1. SIR MON=ON -starts monitoring (system services)
2. SIR SMF=ON - starts monitoring for I/O related counters
3. SYSDEF TD,RESETCNT - resets counters
4. <monitor interval - e.g. 1 or more hour at peak>
5. SIR MON=OFF - stops monitoring
6. QUERY TD - displays CPU counters
7. SIR MON - displays SVC counters
8. SIR SMF - displays I/O counters
9. To start next interval, begin with 1.
 - when finished: SIR SMF=OFF

Processor upgrade ...

Tasks before the upgrade ...

- Review / update your z/VSE definitions, e.g.
 - Stop sub-capacity pricing data collection (CMT) before you upgrade
 - Save your CMT files
 - If you use a \$ASIPROC.PROC, add the new CPU id.
 - If you use DASD sharing, initialize the lock file at first IPL

- Review / update z/VM definitions
 - Verify, if the z/VM release is supported on the new processor
 - Review definitions of guest systems

- Review / upgrade vendor definitions
 - Update vendor software before the upgrade, if required
 - Verify license requirements

Processor upgrade ...

- Processor upgrade:
 - Generate the IOCDS for the new processor
 - Define the LPARs on the new processor
 - Configure the terminal sessions, if you use the OSA-Express Integrated Console Controller
 - Configure your OSA-Express devices (on HMC, e.g. CHPID type OSE for SNA or TCP/IP)
 - Verify your settings in a test environment before going into production

- Disk / tape upgrade
 - Check the PSP bucket for the device
 - Install required PTFs, if any
 - Upgrade to the new devices

- Concurrent microcode upgrade for IBM System Storage (tape / disk)
 - Recommendation: shutdown your system, upgrade to microcode, re-ipl

Processor upgrade ...

- Recommendation: Upgrade to new hardware and z/VSE release
 - Avoid an upgrade to new hardware and software in one step
 1. Upgrade to new hardware first and run workload in production for some time
 - Verify performance characteristics
 2. Upgrade to new z/VSE release

- Consider Architectural Level Set (ALS)
 - z/VSE V5 ALS – z9 and later
 - z/VSE 6.1 ALS – z10 and later
 - z/VSE 6.2 ALS – z114 / z196 and later

 - z/VM 6.4 – z114 / z196 and later
 - z/VM 7.1 – zBC12 / zEC12 and later

- See the z/VSE hardware and release status information for more details
<https://www.ibm.com/it-infrastructure/z/zvse-resources>

Upgrade to IBM z14 or z14 ZR1

- z14 and z14 ZR1 start IPL in z/Architecture mode, no longer in ESA/390 mode
 - VSE/ESA releases and z/VSE 3.1 can not IPL on z14 and z14 ZR1
 - z/VSE Version 4 releases can only IPL in z/VM 6.4 guests, not in LPAR
 - z/VSE 5.1 need to be on the latest PTF level (UD54170)
 - z/VSE 5.2 and z/VSE Version 6 can run on z14 and z14 ZR1
 - Should be on latest PTF level

- z/VSE PSP for z14 ZR1: Upgrade 3907DEVICE, Subset 3907/ZVSE
http://www-01.ibm.com/support/docview.wss?uid=isg1_3907DEVICE_3907-ZVSE

- z/VM PSP for z14 ZR1: Upgrade 3907DEVICE, Subset 3907/ZVM
http://www-01.ibm.com/support/docview.wss?uid=isg1_3907DEVICE_3907-ZVM

Concurrent microcode upgrade of IBM System Storage

- Please consult your device documentation.
- Recommendation for IBM Disk Storage:
 - **(E)CKD disks:** z/VSE **strongly** recommends to shutdown the z/VSE system prior to the microcode upgrade for local disks, and also if remote disks are coupled via PPRC.
 - **FCP-attached SCSI disks:** z/VSE does not support concurrent microcode upgrade for FCP-attached SCSI disks.
 - That is, please shutdown the z/VSE system(s), do the upgrade and-re-IPL the z/VSE system(s). This includes all dependent z/VSE systems (e.g. systems that use the same lock file).
- 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 upgrade.

Migration from coax-attached to ICC printers

- Printer sessions can be defined to OSA-Express Integrated Console Controller (OSA ICC)
 - OSA-ICC is integrate in z9 and higher (CHPID type OSC)
 - Supports TN3270E and non-SNA DFT
 - No terminal controller required for local terminals

- You may use the IUI dialog (as administrator) to configure a OSA-ICC attached printer
 - Select 2 - Resource Definition, now you are on panel "Resource Definition"
 - Select 4 - Hardware Configuration and IPL, the you are on the corresponding panel
 - Select 1 - Configure Hardware, then you are on "Hardware Configuration: Unit Address List"
 - Press PF6 to add a new address, you are on "Hardware Configuration: Add a device"
 - Enter the address(es) of the device and enter a "?" in line "Device name"
 - Press enter, you are prompted for device name, next is panel "Hardware Configuration: Device Group"
 - Select 1 - Local non SNA (Terminals/PCs), you are on "Selection list: Devices"
 - On the bottom of the list you see DSC printers, select e.g DSCPRT
 - Press enter, you are on "Hardware Configuration: Non-SNA Terminal List"
 - Press PF5 to process the device to be added, back on panel "Hardware configuration: Unit address list"
 - Press PF5 to process (prepare to update IPL, CICS / VTAM definitions),
you are on "Hardware Configuration: Catalog startup members"
 - Press enter to prepare update job, you are on "Job disposition" panel
 - press enter to submit job
(press enter again, if you have an ICCF member with job name, or change job name and press enter)

Backup your system and data

- Backups should be performed regularly, ... and verify your backups
- Backup utilities
 - „Flashcopy“
 - „ICKDSF PPRC“
 - z/VM DDR
 - VSE/Fastcopy
 - VSE/VSAM IDCAMS
 - Librarian backup
 - VSE/POWER POFFLOAD
 - VTAPE (e.g. via Tivoli Storage Manager - IBM Spectrum Protect)
 - ISV tools
 - ...
- Ensure that data is consistent
 - E.g. shutdown partitions that access data, before Fastcopy
 - VSE/VSAM catalog and data space



Multi-Version Measurement (MVM)

- MVM replaces the Migration Pricing Option (MPO) and Single Version Charging (SVC)
- No time limits for running multiple eligible versions of a software program on the same machine
 - VSE/ESA V1 / V2, z/VSE 3.1, z/VSE V4, z/VSE V5, z/VSE V6, in any combination
- E.g. systems with zELC, AEWLC and MWLC pricing are eligible for MVM.
- MVM only possible for versions within same machine. Multiple machines can not be combined.
- MVM web page: <https://www.ibm.com/it-infrastructure/z/software/pricing-multi-version-measurement>
- Full-capacity clients:
 - No additional requirements
 - Need to request MVM, except SVC systems
 - If one non-subcapacity Version on machine, you will be billed at the highest version price as full capacity.

Multi-Version Measurement (MVM) ... & SCRT

- Sub-capacity clients
 - Pay for the combined MSUs (concurrent peak) at the latest version price.
 - Sub-Capacity Reporting Tool (SCRT) requirement:
 - Latest SCRT tool (Java)
 - Command line interface
 - Java-version, 32- and 64-bit Java supported on Windows & Linux
 - Download: <https://www.ibm.com/it-infrastructure/z/software/pricing-tools>
 - Sample on how to automate the SCRT process (data transfer, REXX tool)
ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/zVSE_Samples.pdf
 - White paper “Using SCRT with z/VSE – Best Practices”
https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/technical_articles_and_whitepapers.html
 - IBM Z software pricing (licensing, tools, resources, ...) <https://www.ibm.com/it-infrastructure/z/software/pricing>

z/VSE Release / Version upgrade

- Planning tasks
 - Verify requirements for new release / version (see z/VSE Planning book for details)
 - e.g. required hardware (processor, installation medium)
 - Check PSP buckets
 - Upgrade ZVSE620, Subset BASEAPAR
http://www-01.ibm.com/support/docview.wss?uid=isg1_ZVSE620_BASEAPAR
 - Upgrade ZVSE620, Subset OPT-APAR
http://www-01.ibm.com/support/docview.wss?uid=isg1_ZVSE620_OPT-APAR
 - Check, if Recommend Service Level (RSL) available on z/VSE preventive service page
<http://www-01.ibm.com/support/docview.wss?uid=isg3T1027465>
 - Get an MSHP retrace of your system (to get list of installed products and service levels)

 - Use the latest service level of your target release / version
 - Order z/VSE release and optional products from IBM Shopz
https://www-304.ibm.com/software/shopzseries/ShopzSeries_public.wss

 - Contact your vendors, if software updates are required
 - Update the vendor software before the FSU migration, if possible

 - Decide on a migration via Fast Service Upgrade (FSU) or initial installation
 - z/VSE Version 5 to Version 6 require an initial installation
 - z/VSE 6.1 to z/VSE 6.2 can be upgraded via initial installation or FSU

z/VSE Release / Version upgrade

- Data migration
 - Use the utilities provided by the product / component
 - Migration from ECKD to SCSI, see paper z/VSE SCSI Support and Migration Options https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/technical_articles_and_whitepapers.html
Possibility to setup mixed ECKD / SCSI or SCSI only environments
 - Initial installation:
 - Migrate batch environment (jobs, settings, procedures, ...)
 - Migrate your CICS environment (SIT, recompile CICS tables / exits, ...)
- Obtain software licenses for IBM and ISV products, if required
 - New z/VSE versions require new licenses
 - TCP/IP for z/VSE Version 2 and the corresponding GPS feature require new licenses
 - License need to be acquired via Shopz, before you get a new key
- Post migration tasks
 - Create a standalone dump tape or disk
- Detailed upgrade information in paper: z/VSE Release and Hardware Upgrade https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/technical_articles_and_whitepapers.html

CICS on z/VSE

- z/VSE 4.2 was the last release with 2 CICS releases
 - CICS/VSE 2.3 and CICS TS for VSE/ESA 1.1
- CICS/VSE 2.3
 - z/VSE 4.3: CICS/VSE can not be used with DL/I
 - Can not run on z/VSE Version 5 and Version 6
 - End of service since October 2012
- CICS TS for VSE/ESA 1.1
 - Can not run on z/VSE Version 6
 - End of service October 31, 2018
- CICS TS for z/VSE 2.1 for z/VSE 6.1
 - Latest release level to migrate DTSECTXN (transaction security into BSM Control File
 - Can not run on z/VSE Version 5 and z/VSE 6.2
 - End of service June 30, 2019
- CICS TS for z/VSE 2.2 for z/VSE 6.2
 - DTSECTXN not supported
 - Can not run on z/VSE Version 5 and z/VSE 6.1

CICS Migration Documentation

- IBM Redbook: Migration to CICS TS for z/VSE
<http://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/sg248390.html?Open>

- CICS Migration Guide - Migration from CICS/VSE to CICS TS for z/VSE (VSE/ESA)
 - PDF Library on CICS TS for z/VSE Knowledge Center
https://www.ibm.com/support/knowledgecenter/en/SSECAB_2.2.0/welcome.html

- CICS Enhancements Guide
 - PDF Library on z/VSE 6.2 Knowledge Center
https://www.ibm.com/support/knowledgecenter/en/SSB27H_6.2.0/pdfs_6.2.0_neu.html

z/VSE Version 6: TCP/IP upgrade

- TCP/IP products (IBM TCP/IP for z/VSE, IBM IPv6/VSE) are preinstalled
 - If you order z/VSE V6, you need to select the TCP/IP product you want to use
 - Please delete the TCP/IP product, you don't have a license for.
 - Run the delete jobs (DELTCPIP, DELIPV6) located in ICCF lib 59
- New IBM IPv6/VSE release (z/VSE 6.1: IBM IPv6/VSE 1.2, z/VSE 6.2: IBM IPv6/VSE 1.3)
 - IBM IPv6/VSE is installed in sublibrary PRD2.TCPIPB
- New IBM TCP/IP for z/VSE Version 2
 - A new version requires a new license key for the Application Pak and the GPS feature
 - To be requested from the IBM Key Center, cover letter holds contact information
 - IBM TCP/IP for z/VSE is installed in sublibrary PRD2.TCPIPC
- Please verify the LIBDEF chain of your TCP/IP startup job. It has to include the sublibrary
 - Of the TCP/IP product
 - That contains the customer information and license key
E.g. for IBM TCP/IP for z/VSE, that is the CUSTDEF.PHASE and PRODKEYS.PHASE
 - Otherwise you will get message: *IPN110E Product key validation failed for Stack reason=GETKNFNB and the job terminates.*
 - Customer number in CUSTDEF.PHASE has to match with the customer number of your key order.

z/VSE 6.2 Compatibility

- Architectural Level Set (ALS) to z114 / z196
- Tape delivery dropped with z/VSE 6.2
 - z/VSE will be delivered on DVD or electronically via Shopz
- z/VSE 6.2 can not be installed on 3380 disks (or 3390 in 3380 track compatibility mode)
 - 3380 disks still supported as data disks
- Upgrade to z/VSE 6.2 via initial installation or Fast Service Upgrade (FSU)
 - FSU from z/VSE 6.1 to z/VSE 6.2 only
 - FSU not supported from z/VSE V5 or if system disks are on 3380
 - z/VSE 6.2 upgrade will fail, if z/VSE not on z114 / z196 or higher

z/VSE 6.2 Compatibility ...

- CICS TS for z/VSE 2.2
 - Replaces CICS TS for z/VSE 2.1 (not supported on z/VSE 6.2)
 - SIT need to be recompiled
 - Recommendation: Recompile / relink CICS tables from earlier
 - TCPIP SERVICE need to be redefined

- CICS transactions no longer protected via DTSECTXN table
 - DTSECTXN table entries to be migrated to Basic Security Manager (BSM) control file

- IBM IPv6/VSE 1.3 replaces IBM IPv6/VSE 1.2 (not supported on z/VSE 6.2)

- IBM TCP/IP for z/VSE 2.2 replaces IBM TCP for z/VSE 2.1 (not supported on z/VSE 6.2)

- Starting with z/VSE V6.1, z/VSE is shipped as English version only.

Upgrade to a supported z/VSE release

- Please upgrade to a supported z/VSE release to get the latest software service, hardware exploitation and functionality
 - **z/VSE 6.1** planned end of service (eos): **June 30, 2019**
- Currently supported releases: z/VSE 6.1 and 6.2
 - **z/VSE 6.1** requires an initial installation and supports z10 and higher
 - **z/VSE 6.2** supports z114 / z196 and higher
 - FSU from z/VSE 6.1 supported
- Multi-Version Measurement (MVM): <https://www.ibm.com/it-infrastructure/z/software/pricing-multi-version-measurement>
- z/VSE release & hardware upgrade white paper available:
https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/technical_articles_and_whitepapers.html
- CICS TS for z/VSE V2 migration aspects in CICS TS for z/VSE Enhancements Guide:
https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/pdfs_6.2.0_neu.html

More tips

- Spooled 3800 printers for CICS partitions
 - In rare cases there may be a problem during CICS initialization
 - Symptom: CICS abends, hardwait FED or FFF
 - Trigger: ASSGN SYSLST to spooled 3800 printer device type
 - Resolution: ASSGN SYSLST to another printer device type, such as PRT1.

- Quiesce / shutdown signal in z/VSE
 - To be enabled at IPL with SYS QUIESCE
 - Signal-quiesce event from HMC or z/VM triggers messages
OW01D DO YOU WANT TO CONTINUE SYSTEM SHUTDOWN (WILL BE FORCED AFTER TIMEOUT)?
REPLY 'YES' TO ENTER HARD WAIT STATE OR 'NO'
YES = hardwait, NO or no reply = hardwait after predefined time-interval

- IPL delayed because of larger memory
 - More CPU time required for larger memory, because of page frame validation
 - To reduce delays during IPL use only the real memory required for your workload (max. VSIZE, e.g. with NOPDS IPL option)

- Stop long running redisplays, e.g. if you use a filter
 - If you are in redisplay mode, use PF6 (CNCL) to stop redisplay process

- How to include TCP/IP messages into the Online Message File (OME)
 - See blog entry https://www.ibm.com/developerworks/community/blogs/vse/entry/How_to_include_TCP_IP_messages_into_the_online_message_file?lang=en

Daylight Saving Time (DST) change with z/VSE

- Time change for Germany on October 27, 2019
- Time change
 - Forward (summer time) has normally no impact, except e.g. for accounting
 - Backward (winter time) could effect subsystem, accounting and logging, ...
- z/VSE recommendation: IPL z/VSE systems for any time changes
- You may use the IPL commands SET ZONEDEF and SET ZONEBDY to switch between standard and daylight local times. IPL is required, however.
- More information on time changes
 - CICS technote: [Daylight Savings Time changes effect on CICS](#)
 - [z/VSE Hints and Tips](#): section System Data and Time
 - Technical article: [Daylight Savings Time change with z/VSE](#)



z/VSE Service & Support

z/VSE Service & Support

- Service and support web page on <http://www-01.ibm.com/support/docview.wss?uid=isg3T1027442>
- Hot service news shows important updates on our service and support web pages <http://www-01.ibm.com/support/docview.wss?uid=isg3T1027442#news>
- Preventive service: information on
 - Service refreshes
 - PSP buckets
 - Recommended Service Levels (RSLs)
 - Security and system integrity
- Corrective service - Latest APARs per z/VSE component
- z/VSE security and system integrity APARs
- CICS TS service status -> <http://www-01.ibm.com/support/docview.wss?uid=isg3T1027422>
- IBM Support Guide: <https://www-01.ibm.com/support/docview.wss?uid=ibm10733923>

z/VSE Service & Support ...

- The z/VSE service team may ask for the following material for problem analysis
 - SIR command output
 - Console log
 - Information about hardware / system changes
 - Did the workload change ?
 - Were any new PTFs / products installed ?
 - Did the configuration change (new processor / devices) ?
 - Does the problem occur once or multiple times ? Is it reproducible ?
 - Does the problem occur on the test or production system ?

- Upload of customer data requires an IBM id
 - Since May 25, 2018, to meet legal requirements
 - Please see the Enhanced Customer Data Repository (ECuRep) web page <https://www-01.ibm.com/support/docview.wss?uid=ibm10739283>

- Tape delivery in Shopz is discontinued <http://www-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/FLASH10889>

- Please visit the z/VSE hot service news for details <http://www-01.ibm.com/support/docview.wss?uid=isg3T1027442>

z/VSE Service & Support: New service tool to open PMRs (cases)

- New Support site to replace the IBM Service Request Tool and Retain
- IBM Z software products will migrate to the new Support site this summer. IBM Z hardware later.
- New Support site provides
 - Improved product selection
 - Simplified search
 - Greater visibility into the status of your support cases
 - New Support site URL: <http://www.ibm.com/mysupport>
- You won't be able to open cases (today called PMRs) until the migration of IBM Z software products is complete.
- Recommendation: Attend Q/A webinars: <https://www-01.ibm.com/support/docview.wss?uid=ibm10888373>
- Replays: https://mediacenter.ibm.com/media/t/1_3lexsp7e
- Please visit my blog for any news: <https://www.ibm.com/developerworks/community/blogs/vse/?lang=en>

News, z/VSE status, Documentation , ...

z/VSE 6.2 Hints & Tips

- z/VSE 6.2 Hints & Tips can be downloaded from z//VSE Technical Articles and Whitepapers
https://www.ibm.com/support/knowledgecenter/en/SSB27H_6.2.0/technical_articles_and_whitepapers.html

- Some chapters reworked and new information added
 - Examples of new information
 - “Activate TCP/IP messages in the Online Message File” on page 279
 - “CICS TS CSD Migration” on page 284
 - “DFHCSDUP Utility” on page 307
 - “Apply PTF from the internet” on page 309
 - “Transferring Tape Image Files to virtual Tape” on page 310
 - “How to define and use auxiliary trace file B” on page 314
 - Information related to z/VSE 6.2

z/VSE Resources - status

- z/VSE release on <https://www.ibm.com/it-infrastructure/z/zvse-resources>
 - Supported z/VSE release, PDF includes supported hardware
 - z/VSE adapters and crypto
 - IBM storage
 - IBM Z servers

Supported z/VSE releases

Version.Release	Date available	Withdrawal from Marketing effective (1)	Withdrawal from Service effective	Minimum z/VM level (2)
→ z/VSE V6.2	12/01/2017 Announcement	TBD	TBD	z/VM V5.4
→ z/VSE V6.1	11/27/2015 Announcement	12/01/2017 Announcement	06/30/2019 Announcement	z/VM V5.4
→ z/VSE V5.2	04/25/2014 Announcement	03/13/2017 Announcement	10/31/2018 Announcement	z/VM V5.4

z/VSE Resources - status ...

z/VSE server support			
IBM z Systems, IBM System z, zSeries and S/390 Server	z/VSE V6.2	z/VSE V6.1	z/VSE V5.2
IBM z14 ZR1 (1)	Yes	Yes	Yes (4)
IBM z14 (1)	Yes	Yes	Yes (4)
IBM z13s (1)	Yes	Yes	Yes
IBM z13 (1)	Yes	Yes	Yes
IBM zEnterprise BC12 (1)	Yes	Yes	Yes
IBM zEnterprise EC12 (1)	Yes	Yes	Yes
IBM zEnterprise 114	Yes	Yes	Yes
IBM zEnterprise 196	Yes	Yes	Yes
IBM zEnterprise BladeCenter Extension (zBX) - IEDN Support	Yes (2,3)	Yes (2,3)	Yes (2,3)
IBM System z10 BC	No	Yes	Yes
IBM System z10 EC	No	Yes	Yes
IBM System z9 EC (formerly z9-109)	No	No	Yes
IBM System z9 BC	No	No	Yes
zSeries 990, 890	No	No	No
zSeries 900, 800	No	No	No
S/390 Parallel Enterprise Server G5/G6	No	No	No
S/390 Multiprise 3000	No	No	No



z/VSE Resources - status ...

- z/VSE unsupported releases on <https://www.ibm.com/it-infrastructure/z/zvse-resources>
 - Supported z/VSE release, PDF includes supported hardware

Unsupported releases may run on these servers at user's risk							
IBM z Systems, IBM System z, zSeries and S/390 Server	z/VSE V5.1 (1)	z/VSE V4.1, V4.2 and V4.3 (1)	z/VSE V3.1 (1, 5)	VSE/ESA V2.7 and V2.6 (1)	VSE/ESA V2.5 (1)	VSE/ESA V2.4 (1)	VSE/ESA V2.3 (1)
IBM z14 ZR1 (7)	Yes (8)	LPAR: No z/VM: Yes (6, 9)	No	No	No	No	No
IBM z14 (7)	Yes (8)	LPAR: No z/VM: Yes (6, 9)	No	No	No	No	No
IBM z13s (7)	Yes	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM z13 (7)	Yes	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM zEnterprise BC12 (7)	Yes	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM zEnterprise EC12 (7)	Yes	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM zEnterprise 114	Yes	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM zEnterprise 196	Yes	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM System z10 EC	Yes	Yes (6)	Yes (6)	Yes (4)	Yes (4)	No (2)	No (2)
IBM System z10 BC	Yes	Yes	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM System z9 EC (formerly z9-109)	Yes	Yes	Yes (4)	Yes (4)	No (2)	No (2)	No (2)
IBM System z9 BC	Yes	Yes	Yes (4)	Yes (4)	No (2)	No (2)	No (2)

Documentation related to z/VSE

- z/VSE Collection Kit
 - Available for download in IBM Publication Center <https://www-05.ibm.com/e-business/linkweb/publications/servlet/pbi.wss>
 - Electronic only, not on physical DVD
 - z/VSE 6.2 Collection Kit: SK3T-8348-15

- Documentation of z/VSE releases - z/VSE Internet Library on <http://www.ibm.com/systems/z/os/zos/bkserv/vse.html>

- z/VSE Knowledge Center: http://www.ibm.com/support/knowledgecenter/SSB27H/zvse_welcome.html
 - Link to PDF library (z/VSE documentation)

- CICS TS for z/VSE Knowledge Center: <https://www.ibm.com/support/knowledgecenter/SSECAB>

z/VSE Knowledge Center

IBM IBM Knowledge Center

Home > z/VSE >

z/VSE welcome page

Select ^

Select

Version 6.2.0

Version 6.1.0

Version 5.2.0

entry point to product information about z/VSE. Use the links in the Table of Contents for specific versions and editions of this product family. DeveloperWorks, Redbooks, and white papers are also provided when articles are available. On this page, you can find entry points to sites that help you stay current and other IBM products. There are also links to web sites that help you stay current.

Learn more

[z/VSE Home Page](#): News and General information about z/VSE

[z/VSE products and components](#): General information about z/VSE products and components

[Explore IBM Systems](#): General information about Systems products

[Redbooks](#): Technical publications by experts about hundreds of subjects

https://www.ibm.com/support/knowledgecenter/SSB27H/zvse_welcome.html

CICS TS for VSE Knowledge Center

IBM Knowledge Center

Home > CICS Transaction Server for z/VSE >

CICS Transaction Server for z/VSE

Select ^

Select on or edition of CICS Transaction Server for z/VSE documentation from

Version 2.2.0

Version 2.1.0

Version 1.1.1

Learn more

- [Online catalog of software products](#): General information about software products
- [Explore IBM Systems](#): General information about Systems products
- [IBM Cloud Computing](#): Materials about the promise of cloud
- [Redbooks](#): Technical publications by experts about hundreds of subjects
- [developerWorks](#): A community site with a vast amount of information for IT professionals

<https://www.ibm.com/support/knowledgecenter/SSECAB>

z/VSE Requirements

- You may submit requirements at conferences (GSE, zUniversity, VM Workshop, ...)

- **z/VSE** requirements via the Request for Enhancements (RFE) database:
<http://www.ibm.com/developerworks/rfe/>
 - Please select the following for z/VSE requirements
 - *Brand = Servers and System Software*
 - *Product family = z Systems Software*
 - *Product = z/VSE*
 - *Component = General, z/VSE, VSE/AF, VSE/VSAM, VSE/POWER, VSE Unique Code, ...*
 - *Operating system = IBM z/VSE*
 - *Source = Share, IBM user group, IBM Conference, ..., Other*

- **CICS Transaction Server** requirements via the Request for Enhancement (RFE) database:
<http://www.ibm.com/developerworks/rfe/>
 - Please select the following for z/VSE-CICS requirements:
 - *Brand = Servers and Systems Software*
 - *Product family = Transaction Processing*
 - *Product = CICS Transaction Server*
 - *Component = Runtime or Explorer*
 - *Operating system = IBM z/VSE*

Documentation related to z/VSE ...

- IBM Redbooks - <http://www.redbooks.ibm.com/>
 - Redbook page with new / updated IBM z Systems mainframe Redbooks
 - zEC12 / zBC12 / z13 / z13s / z14 / z14 ZR1 Technical Guides
 - IBM System z Connectivity Handbook, SG24-5444
 - Introduction to the New Mainframe: z/VSE Basics <http://www.redbooks.ibm.com/abstracts/sg247436.html?Open>
 - Security on IBM z/VSE – updated <http://www.redbooks.ibm.com/abstracts/sg247691.html?Open>
 - z/VSE Using DB2 on Linux for System z <http://www.redbooks.ibm.com/abstracts/sg247690.html?Open>
 - Enhanced Networking on IBM z/VSE <http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg248091.html?Open>
 - Migration to CICS TS for z/VSE <http://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/sg248390.html?Open>

Documentation related to z/VSE ...

The screenshot shows the IBM Redbooks website interface. At the top, there is the IBM logo, a 'Marketplace' button, a search icon, and a user profile icon. Below this is a navigation bar with 'Redbooks' and several categories: 'IT Infrastructure', 'Software', 'Storage', 'Training', and 'About Redbooks'. The main content area shows the breadcrumb 'IBM Redbooks > z Systems >' followed by the title 'Migration to CICS Transaction Server for z/VSE V2.1' and the subtitle 'An IBM Redbooks publication'. It also states 'Published 10 May 2017'. The main content is divided into three columns: 1. A book cover image with the title and ISBN information (ISBN-10: 0738442461, ISBN-13: 9780738442464, IBM Form #: SG24-8390-00, 282 pages). 2. 'View online' options: 'Download PDF (2.3 MB)', 'Download EPUB (1.3 MB) for e-book readers', 'Download on the iBookstore', 'GET IT ON Google play', and 'Read in Google Books'. 3. 'More options': 'Discuss this book (0 comments)', 'Permanent link', 'Order Hardcopy', 'Rating', and 'Rate this book'.

<http://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/sg248390.html?Open>

Documentation related to z/VSE ...

The screenshot shows the IBM Redbooks website interface. At the top left is the IBM logo, and at the top right is a 'Marketplace' button. Below the logo is the 'Redbooks' logo and a navigation menu with categories: IT Infrastructure, Software, Storage, Training, and About Redbooks. The breadcrumb trail reads 'IBM Redbooks > z Systems >'. The main title is 'Security on IBM z/VSE', with the subtitle 'An IBM Redbooks publication'. A red 'Updated' badge is positioned to the right of the title. The publication date is 'Published 14 Juni 2018'. Below this is a light grey box containing three columns of options: 'View online' with links for 'Download PDF (21,3 MB)', 'Download EPUB (12,4 MB) for e-book readers', and 'Tips for viewing'; 'More options' with links for 'Discuss this book (0 comments)' and 'Permanent link'; and 'Rating' with a link for 'Rate this book'. To the left of these options is a book cover image for 'Security on IBM z/VSE' with its ISBNs and page count listed below it.

<http://www.redbooks.ibm.com/abstracts/sg247691.html?Open>

Documentation related to z/VSE ...

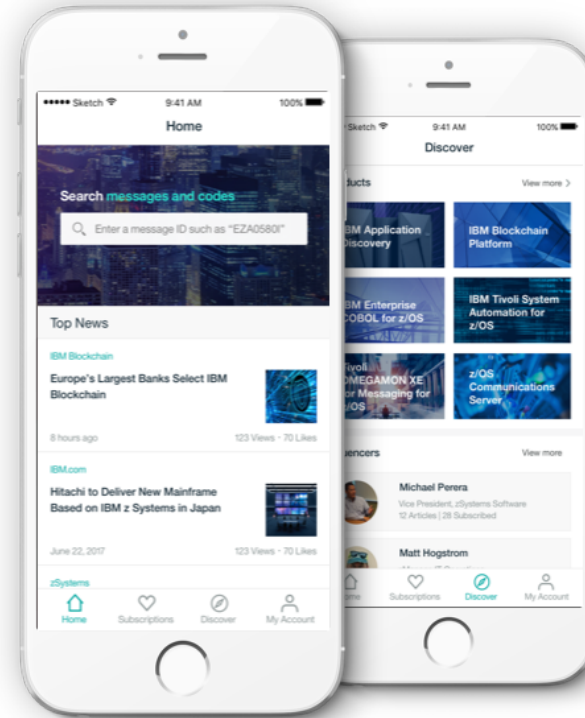
- Technical articles, white papers and Hints & Tips:
https://www.ibm.com/support/knowledgecenter/SSB27H_6.2.0/technical_articles_and_whitepapers.html
 - Using SCRT (Java Version) with z/VSE – Best Practices
 - z/VSE release & hardware upgrade
 - z/VSE SCSI Support and Migration Options
 - z/VSE z/VM IP assist
 - Parallel Access Volume (PAV) white paper
 -
 - **New:** Hints and Tips for z/VSE 6.2: <http://www.ibm.com/systems/z/os/zvse/documentation/#hints>

- Sample code: Transfer SCRT89 records via the Host Transfer File
 - Link in PDF ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/zVSE_Samples.pdf



IBM Doc Buddy v2.0

With the IBM Doc Buddy mobile app, you can search messages and codes issued from IBM Z products online and offline. IBM Doc Buddy V2 also aggregates mainframe content including blogs, videos, IBM Knowledge Center topics, and Thought Leader opinions.



iOS



Android

<https://ibmdocbuddy.mybluemix.net>

More Information

- z/VSE Homepage: www.ibm.com/vse

- z/VSE Knowledge Center: https://www.ibm.com/support/knowledgecenter/en/SSB27H/zvse_welcome.html

- IBM Redbooks (search for z/VSE): <http://www.redbooks.ibm.com>

- Ingolf's z/VSE blog: www.ibm.com/developerworks/mydeveloperworks/blogs/vse/
 - Use „Tags“ to search for topics

- VSE-L discussion list: <https://groups.google.com/forum/?fromgroups#!forum/bit.listserv.vse-l>

Thank you!

Questions ?

Ingolf Salm
salm@de.ibm.com
IBM Germany

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

BigInsights	DFSMSdss	FICON*	IMS	RACF*	System z10*	zEnterprise*
BlueMix	DFSMSHsm	GDPS*	Language Environment*	Rational*	Tivoli*	z/OS*
CICS*	DFSORT	HyperSwap	MQSeries*	Redbooks*	UrbanCode	zSecure
COGNOS*	DS6000*	IBM*	Parallel Sysplex*	REXX	WebSphere*	z Systems
DB2*	DS8000*	IBM (logo)*	PartnerWorld*	SmartCloud*	z13	z/VM*
DFSMSdfp						

* Registered trademarks of IBM Corporation

The following are trademarks or registered trademarks of other companies.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.
 Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.
 Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
 IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.
 ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.
 Java and all Java based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.
 Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and
 Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
 Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.
 OpenStack is a trademark of OpenStack LLC. The OpenStack trademark policy is available on the [OpenStack website](#).
 TEALEAF is a registered trademark of Tealeaf, an IBM Company.
 Windows Server and the Windows logo are trademarks of the Microsoft group of countries.
 Worklight is a trademark or registered trademark of Worklight, an IBM Company.
 UNIX is a registered trademark of The Open Group in the United States and other countries.
 * Other product and service names might be trademarks of IBM or other companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

This information provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g. zIIPs, zAAPs, and IFLs) ("SEs"). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the "Authorized Use Table for IBM Machines" provided at www.ibm.com/systems/support/machine_warranties/machine_code/aut.html ("AUT"). No other workload processing is authorized for execution on an SE. IBM offers SE at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.