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# zPL3036 - Hints and Tips for IBM z/VSE
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# 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  VTAPEBUF(=<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 1I40I  READY
```

# SIR – System Information Report

```
SYSTEM:    z/VSE                    z/VSE 5.1              TURBO (01)        USER:   SYS
VM USER ID:LNXSALM1                                                          TIME:   01:21:15
sir
AR 0015 CPUID  VM = 003B0B8220978000                  VSE = FF3B0B8220978000
AR 0015 PROCESSOR = IBM 2097-726 51 (70B8251)  LPAR = SPB        No. = 0059
AR 0015        CPUs = 0003 (Ded.=0000 Shr.=0003) Cap. =   11%
AR 0015 VM-SYSTEM = z/VM     6.1.0   (1301)   USERID = LNXSALM1 VMCF = ON
AR 0015        CPUs = 0006                      Cap. = 100%
AR 0015 PROC-MODE = z/Arch(64-BIT)  IPL(007)     01:19:02       10/18/2013
AR 0015 SYSTEM    = z/VSE            5.1.1                       05/02/2012
AR 0015           VSE/AF            9.1.0       DY47323         04/09/2012
AR 0015           VSE/POWER         9.1.0       DY47302         04/12/2012
AR 0015 IPL-PROC  = $IPLESA         JCL-PROC  = $$JCL
AR 0015 SUPVR     = $$A$SUPI        TURBO-DISPATCHER (81) ACTIVE
AR 0015                             HARDWARE COMPRESSION ENABLED
AR 0015 SEC. MGR. = BASIC           SECURITY  = ONLINE
AR 0015 VIRTCPU   = 0000:00:02.044        CP = 0000:00:00.578
AR 0015 CPU-ADDR. = 0000(IPL)    ACTIVE
AR 0015   ACTIVE  = 0000:00:01.144   WAIT = 0000:01:55.983
AR 0015   PARALLEL= 0000:00:00.289   SPIN = 0000:00:00.000
AR 0015 CPU-ADDR. = 0001            CPU INACTIVE NOT PREFIXED
AR 0015 CPU-ADDR. = 0002            CPU INACTIVE NOT PREFIXED
AR 0015 CPU-ADDR. = 0003            CPU INACTIVE NOT PREFIXED
AR 0015 CPU-ADDR. = 0004            CPU INACTIVE NOT PREFIXED
AR 0015 CPU-ADDR. = 0005            CPU INACTIVE NOT PREFIXED
AR 0015 CPU timings MEASUREMENT INTERVAL    0000:02:13.262
AR 0015 TASKS ATT.= 00015           HIGH-MARK = 00015    MAX = 00330
AR 0015 DYN.PARTS = 00000           HIGH-MARK = 00001    MAX = 00138
AR 0015
AR 0015 COPY-BLKS = 00015           HIGH-MARK = 00041    MAX = 01502
AR 0015 CHANQ USED= 00004           HIGH-MARK = 00011    MAX = 00080
AR 0015 LBL.-SEGM.= 00007           HIGH-MARK = 00007    MAX = 00717
AR 0015 LOCKS EXT.= 0000000613      LOCKS INT.= 0000005997
AR 0015      FAIL = 0000000014           FAIL = 0000000022
AR 0015 LOCK I/O  = 0000000757      LOCK WRITE= 0000000012
AR 0015 1I40I  READY


==>

1=HLP 2=CPY 3=END 4=RTN 5=DEL 6=DELS 7=RED 8=CONT 9=EXPL 10=HLD 11=PCUU 12=RTRV

ACT_MSG: HOLDRUN           PAUSE: 01   SCROLL: 1              MODE:   CONSOLE
```

# SIR  Refresh Level

- z/VSE refresh level or SPLEVEL only changed after Fast Service Upgrade
  - SPLEVEL.PROC replaced

- PSB buckets (Hiper PTFs), RSL or single PTF do not change the SIR refresh level

- VSE/AF and VSE/POWER component levels modified by FSU, PSB bucket, RSL or PTF, if component is affected
  - VSE/AF shows the Supervisor ($$A$SUPI) APAR level
  - VSE/POWER shows the APAR level of phase IPW$$DT

```
sir
AR 0015 CPUID  VM = 003B0B8220978000            VSE = FF00001820978000
AR 0015 PROCESSOR = IBM 2097-729 51 (70B8251)  LPAR = SPB       No. = 0059
AR 0015      CPUs = 0003 (Ded.=0000 Shr.=0003) Cap. =   10%
AR 0015 VM-SYSTEM = z/VM     6.1.0    (1301)    USERID = ZVSE510  VMCF = ON
AR 0015      CPUs = 0001                        Cap. =   33%
AR 0015 PROC-MODE = z/Arch(64-BIT)   IPL(230)    23:47:55 EST   08/27/2013
AR 0015 SYSTEM    = z/VSE        5.1.2                  04/19/2013      <--- Refresh Level
AR 0015          VSE/AF         9.1.0    DY47436    02/12/2013      <--- Component Level AF
AR 0015          VSE/POWER      9.1.0    DY47302    04/12/2012      <--- Component Level POWER
AR 0015 IPL-PROC  = $IPLESA     JCL-PROC  = $$JCL
AR 0015 SUPVR     = $$A$SUPI    TURBO-DISPATCHER (81) ACTIVE
AR 0015                         HARDWARE COMPRESSION ENABLED
AR 0015 SEC. MGR. = BASIC       SECURITY  = ONLINE
```

# SIR – System Information Report *

- 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 1I40I   READY
```

- 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 PO 31 =            2   PGFLT IMM PO 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
```

# SIR MIH

- MIH = Missing Interrupt Handler = z/VSE Supervisor routine, that get control regularly
- Verifies if I/O is not completed after a defined interval
- Appropriate message will be writen to the console and the recorder file, if a device is in error
- SIR MIH may enable / disable the MIH process
- SIR MIH without a parameter displays the current settings
- SIR MIH may set an interval per device or for all devices
- Default is enabled, time interval is 3 minutes
  - z/VSE waits for at least 3 minutes, if an I/O does not complete, until it writes an (action) message (0E02t DEVICE cuu LOST CHAN+DEV END) to the z/VSE console.
- Time interval depends on the timing of your devices
  - Tape devices need loger intervals than disks

- Please change system parameters only, if required for your workload

# STACK – Stack Attention Routine commands *

- The STACK command can be used to
  - Abbreviate z/VSE commands
  - Suppress or change any z/VSE command
  - Prepare a sequence of commands and/or replies

```
stack MV|MAP &0|GETVIS &0|        ◄──────
AR 0015 1I40I   READY
stack show        ◄──────
AR 0015 VIS|GETVIS &0,ALL
AR 0015 MV|MAP &0|GETVIS &0|
AR 0015 1I40I   READY
mv bg        ◄──────
AR 0015 1I40I   READY
AR 0015 MAP BG
AR 0015   PARTITION: BG        SPACE-GETVIS.......:      (N/A)
AR 0015   SPACE....: 0        ALLOC (VIRTUAL)...:      6144K  ADDR: 400000
AR 0015   STATUS...: VIRTUAL    SIZE.............:      1280K
AR 0015   POWER-JOB: PAUSEBG
AR 0015   JOBNUMBER: 328        GETVIS..........:      4864K  ADDR: 540000
AR 0015   JOBNAME..: PAUSEBG
AR 0015   PHASE....:
AR 0015   TASKS....: ANY        PFIX(BELOW)-LIMIT :      0K
AR 0015                               -ACTUAL:      0K
AR 0015                         PFIX(ABOVE)-LIMIT :      0K
AR 0015                               -ACTUAL:      0K
AR 0015 1I40I   READY
AR 0015 GETVIS BG
AR 0015 GETVIS AREA FOR BG IS NOT INITIALIZED
AR 0015 1I40I   READY
```

# LOCK display and trace *

- The Attention Routine LOCK command displays and traces LOCK/UNLOCK events
- LOCK SHOW[=pid]|[resource name] to display lock resources
  - pid = SYSLOG id
- LOCK TRACE to activate the trace
- LOCK TRACE[=pid][,resource name] to trace all, a partition and/or a specific resource

```
lock show=f2
AR 0025 LOCKTAB ENTRY
V0006F7D0   ........  7FFA0A80 00000000 C4E3E2E5 *     "³ 0      DTSV*
V0006F7E0   C5C3E3C2 40404040 11800001 0006F7F4 *ECTB       0      74*
V0006F7F0   0006F7B4                             *    7©           *
AR 0025 OWNER ELEMENT
V7FFA0A80   00000000 01F40000 00011000 00000000 *     4            *
AR 0025 LOCKTAB ENTRY
V7FFA0FE0   0006F844 00000000 E5C4D6E2 D9C5E200 *   8à    VDOSRES *
V7FFA0FF0   00000000 04C00000 7FFA0FC0 0006F814 *     {  "³ {  8 *
AR 0025 OWNER ELEMENT
V0006F840   ........  7FFA0EF0 00200001 00000000 *     "³ 0        *
V0006F850   00000000                             *               *
```

# GETVIS - retrieve partition and GETVIS information

- Use the GETVIS command e.g. to identify
  - areas of GETVIS shortage or the subpool, where the GETVIS space wasn't freed
- Command described in "System Control Statements
- Example
  - GETVIS SVA shows shortage on SVA(24 bit) storage
    - If VTAM buffers are allocated in SVA(24 bit)
      Move them into SVA(31 bit) - set the VTAM startup parameter
    - If the SVA (31 bit) is short on storage too, Increase the SVA(31 bit)

```
getvis sva,all
AR 0015 GETVIS USAGE    SVA-24      SVA-ANY                  SVA-24      SVA-ANY
AR 0015   AREA SIZE:    1,900K      34,256K
AR 0015   USED AREA:      796K      10,684K MAX. EVER USED:    828K      15,836K
AR 0015   FREE AREA:    1,104K      23,572K LARGEST FREE:    1,100K      17,348K
AR 0015 SUMMARY REPORT
AR 0015 SUBPOOL         REQUEST  <--SVA-24-AREA---   --SVA-ANY-AREA-->
AR 0015 Default                               288K                 176K
AR 0015 IJBMCB                                 60K                   0K
AR 0015 ISTSVF                                 52K                 312K
AR 0015 IPWPWR                                 36K                   0K
AR 0015 IJBFF300A0     SPACE                   24K                   0K
AR 0015 IPTIB                                  20K                  52K
AR 0015 INLSLD                                 20K                   0K
AR 0015 IINIT                                  16K                  96K
AR 0015 IJBHCF                                 12K                   0K
AR 0015 IJBFF200B0     SPACE                    8K                   0K
AR 0015 ISTSVP                                  8K                 276K
```

# Problem management tools

- ABEND / system dump
  - Amount of dump data dependent on JCL OPTIONs
- DUMP command
  - Attention Routine command
- Stand-alone dump (program)
  - Create a stand-alone dump tape for the release you have in production
  - Have standalone dump tapes ready, just in case you need it
  - Always "STORE STATUS" before you take a standalone dump
- SDAID
  - To trace application programs and system events
- Interactive trace
  - // EXEC <program>,TRACE to trace applications
- DEBUG trace

- z/VM CP TRACE command

# IUI Problem handling dialogs

```
IESADMSL.IESEPROB              PROBLEM HANDLING
                                                    APPLID: DBDCCICS
   Enter the number of your selection and press the ENTER key:

        1    Online Problem Determination
        2    Inspect Message Log
        3    Storage Dump Management
        4    Inspect Dump Management Output
        5    Retrace History File
        6    Dump Program Utilities








PF1=HELP                   3=END        4=RETURN                6=ESCAPE(U)
                           9=Escape(m)

==>                                                Path: 4
```

```
IESADMSL.IESEDUMP          DUMP PROGRAM UTILITIES
                                                    APPLID: DBDCCICS
   Enter the number of your selection and press the ENTER key:

        1    Create Standalone Dump Program on Tape
        2    Create Standalone Dump Program on Disk
        3    Remove Standalone Dump Program from Disk
        4    Scan Dump Files on Tape
        5    Scan Dump Files on Disk
        6    Print IPL Diagnostics
        7    Format ICCF Dump Data
        8    Print SDAID Tape
        9    Print Standalone Dump





PF1=HELP                   3=END        4=RETURN                6=ESCAPE(U)
                           9=Escape(m)

==>                                                Path: 46
```
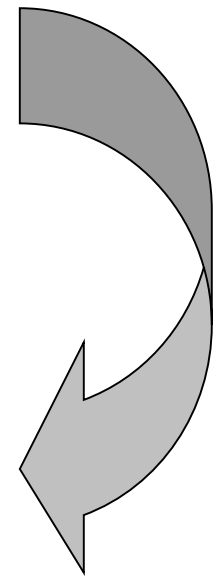
# z/VSE SDAID trace to VTAPE

- SDAID trace output (OUTDEV) may be redirected to a printer,
  real tape or SDAID buffer (BUFFER).

- To send SDAID output to a VTAPE
  - Define a virtual tape via the VTAPE command
  - Initialize the SDAID trace with a **wraparound** buffer as output destination
    OUTDEV BUFFER=<size, buffer size from 4K to 256K>
  - Stop SDAID (STOPSD), when you want to finish the trace
  - Dump the SDAID buffer to the virtual tape via the Attention Routine command
    DUMP BUFFER,<cuu of virtual tape>
  - You may now e.g. print the virtual tape content with DOSVSDMP or the IUI dialog

  - Verify the SDAID trace to VTAPE in a test environment before you use it for problem
    analysis

# How to monitor the Turbo Dispatcher

- How to gather monitored information:
    1) SIR MON=ON      - starts monitoring
    2) SYSDEF TD,RESETCNT - resets TD counters
    3) <monitor interval   - e.g. 1 hour at peak>
    4) SIR MON=OFF     - stops monitoring
    5) QUERY TD        - displays CPU counters
    6) SIR MON         - displays SVC counters
    7) To start next interval
    8) begin with 1)

- 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)

# How to monitor the Turbo Dispatcher

- 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
```

# 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
```

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
 All above values given in milliseconds.

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

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↓ Multi Instant Logic Analyzer4VSAM (updated 07/2014)
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↓ LE/VSE CEETRACE Feature V1.2.1 (Updated 05/2014 for z/VSE V5.2)
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↓ VSE ANT Tasks (updated 01/2014)
↓ z/VSE CPU Monitor Tool (updated 09/2013)
↓ LE/VSE CEETRACE Feature V1.1.2b (updated 05/2013 for z/VSE V4.3)
↓ VSE ZIP Programming Interface (API) (new 11/2011)
↓ LDAP Query Callable Module (new 10/2010)

**Service & support**                              −

→ Recommended Service Level          → IBM Support Portal
                                     → IBM Shopz
→ z/VSE Corrective Service           → Search the APAR database

# 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.
  http://www-03.ibm.com/systems/z/os/zvse/downloads/tools.html#cpumontool
- 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 unterstand 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.



CPU Utilization of workload x

20
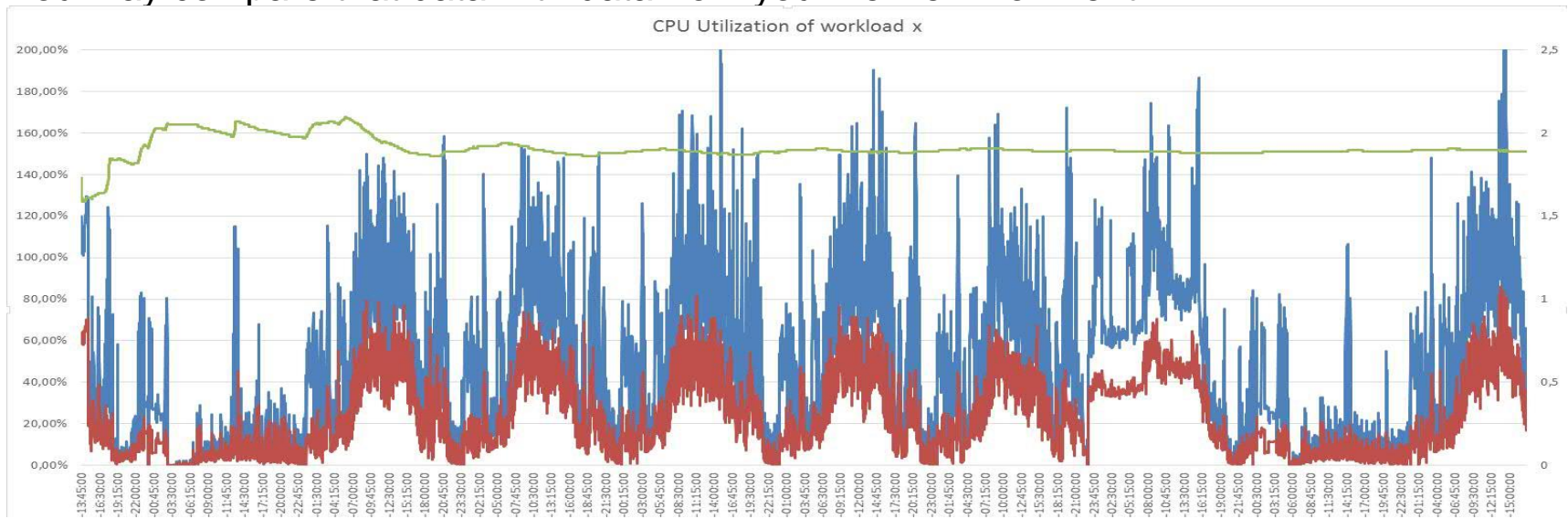
# What to do with unused shared area (24-bit) space ?

- SVA (24 bit) starts after the Supervisor area
- Private area starts at MB boundary
- SVA-24 bit unused space as of MAP command, can not be allocted after IPL complete. Except for allocation of shared partitions (SPSIZE not zero)
- You may tune your IPL parameters to use this space – or reduce the space to get to a lower MB boundary
- Consider your vendor product requirements
- **But** only change values, if you need additional resources.

```
map
AR 0015  SPACE  AREA       V-SIZE   GETVIS   V-ADDR   UNUSED NAME
AR 0015    S    SUP          764K                 0          $$A$SUPI
AR 0015    S    SVA-24      1356K    1848K    BF000    128K
AR 0015    0    BG V        1280K    8960K    400000  143360K PAUSEBG
AR 0015    1    F1 V        1500K   29220K    400000      0K POWSTART
AR 0015    2    F2 V        3040K   49152K    400000      0K CICSICCF
```

# How to interrupt the IPL process

- To temporarily add new devices, modify IPL statements, IPL / JCL procedures or Supervisor names
  - LPAR: Use the IPL load parameter and enter the parameter values on the HMC load panel.
  - z/VM guest: add the load parameter value to the IPL command, e.g. IPL 200 LOADP ..P.

- The load parameter allows to add up to 8 values:
  - 1st value: I = console type,
  - 2nd S = IPL message suppression,
  - 3rd P = IPL parameter prompting,
  - 4th P = startup mode prompting,
  - 5th D = debug mode for installation disk.
  - Values 6 to 8 are reserved.
  - Add periods in positions for defaults. Combinations are possible.

- Examples:
  - to prompt for the startup mode (mini, basic, cold) – use load parameter "...P".
  - To add or change IPL commands - use the parameter "..P"
    - after message 0I03D ENTER SUPERVISOR PARAMETERS OR ASI PARAMETERS
    - enter Supervisor parameters such as the Supervisor name, VIO, NOPDS or VSIZE, VPOOL, ..., or
    - enter IPL procedure (IPL=) and JCL procedure (JCL=), e.g. IPL=$IPLESA,JCL=$$JCL, or
    - Use the STOP= parameter, e.g. STOP=SYS or STOP=ADD to add or change an IPL command. You will be prompted before the first SYS or ADD command (in the example)
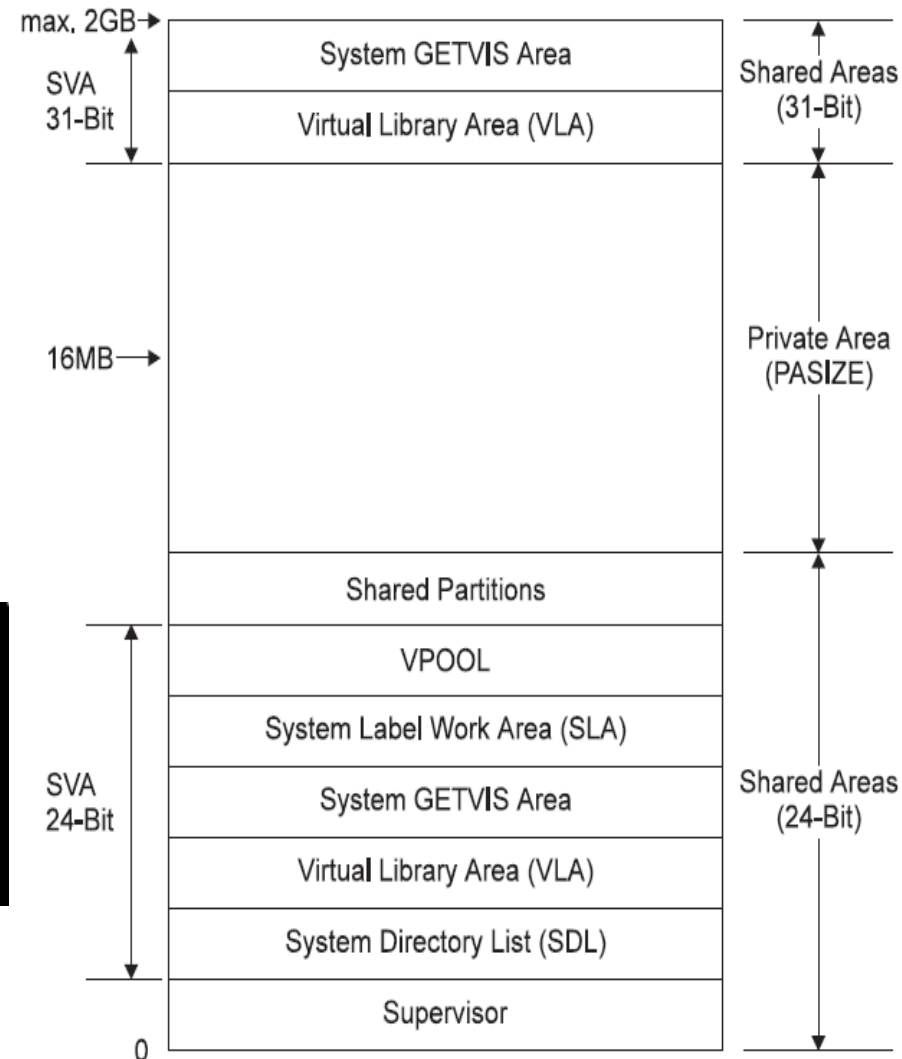
  - Please verify those changes in your test environment first.

IBM Systems Technical University, October 5-9 | Hilton Orlando

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# How to get control during z/VSE system startup

- It may be necessary to get control before the first „// JOB" statement after the IPL complete message, e.g. to recreate the hardcopy or recorder file
  (via SET HC=CREATE or SET RF=CREATE)

- You may use the following procedure:

  1. Specify the IPL parameter LOADPARM ..P
  2. You will be prompted to enter the Supervisor or ASI parameters
  3. Enter your IPL procedure and a JCL procedure, e.g. IPL=$IPLESA,JCL=$$JCLXXX, where the procedure $$JCLXXX does not exist.
  4. You will be prompted after IPL complete with message:
     BG 0000 // EXEC PROC=$0JCLXXX STATEMENT IS GENERATED
     BG-0000 1N20D PROCEDURE NOT FOUND
  5. Now you can instruct z/VSE e.g. to recreate the hardcopy file with the command SET HC=CREATE - see book z/VSE System Control Statements for details
  6. Continue with your BG startup procedure - e.g. // EXEC PROC=$0JCL
     It is just necessary to process the first // JOB statement to open the hardcopy file.
  7. Re-IPL your system

  Please be careful when using such system commands.

# How to prevent a job from execution

- If a VSE/POWER job causes a system failure,
  it may be necessary to stop a job from execution after a re-IPL.

- Use the SET NORUN=YES card in the VSE/POWER startup
  - Applies to locally submitted VSE/POWER job
  - Causes a disposion of „X" for all active reader queue entries at time of failure,
    except reader queue entries submitted with „* $$ JOB JNM=...,NORUN=IGN"
  - DISP X entries may be listed via „PDISPLAY RDR,CDISP=X
  - You may change the disposion back to the original disposition: PALTER RDR,CDISP=X,DISP=*

- „Emulate" NORUN=YES by the following sequence
  - PAUSE F1 AR command after IPL complete message
  - // UPSI 1 statement in partition F1, when prompted
  - VSE/POWER startup completes
  - Dispositions of queue entries may now be changed

- Special considerations apply to shared spool environements
  - See VSE/POWER Administration and Operation book for details

## How to prevent a job from execution ...

```
BG 0000 0I20I IPL COMPLETE FOR VSE/AF 5686CF906 52C  920 GA-LEVEL
BG 0000        SUPVR USERID IS: Z.VSE.SUPI
BG 0000 PRTY BG,FA,F9,F8,F6,F5,F4,F2,F7,FB,F3,F1
BG 0000 // JOB BGINIT
        DATE 04/08/2014, CLOCK 12/22/24
BG 0000 1I93I RECORDER FILE IS   1% FULL
BG 0000 IESI0221I PARTITIONS F3 F2 F1 WILL BE INITIALIZED IN RECOV START MODE.

BG 0000 IESI0222I REMAINING PARTITIONS WILL BE INITIALIZED IN WARM START MODE.
 IF YOU WANT TO INTERRUPT THEN ENTER MSG BG.
pause f1        ←
AR 0015 1I40I   READY
BG 0000 EXPLAIN ON
EXPLAIN ON
BG 0000 ALLOC BG=10M
```

```
BG 0000 STOP
F1 0001 // JOB POWSTART
        DATE 04/08/2014, CLOCK 12/22/33
F1-0001 1I00D  READY FOR COMMUNICATIONS.
1 // UPSI 1   ←
F1-0001
1           ←
F1 0001 1QB7I   FULL QUEUE FILE RECOVERY IN PROGRESS
F1 0001 1QBCI   QUEUE FILE RECOVERY DETECTED NEW DISP=X JOB(S) IN READER QUEUE
```

```
d rdr,cdisp=x      ←
AR 0015 1C39I COMMAND PASSED TO VSE/POWER
F1 0001 1R46I   READER QUEUE    P D C S  CARDS BU
F1 0001 1R46I   PAUSEBG   00268 3 X 0      4    FROM=(SYSA)
F1 0001 1R46I   CICSICCF  00248 3 X 2      71   FROM=(SYSA)
F1 0001 1R46I   VTAMSTRT  00235 3 X 3      20   FROM=(SYSA)
F1 0001 1R46I   PAUSEF4   00280 3 X 4      4    FROM=(SYSA)
F1 0001 1R46I   PAUSEC    00281 3 X C      3    FROM=(SYSA)
==>
```

# How to prevent a job from execution …

- **Caution**: The following example does not work for VSE/POWER share spooling environments
- Prevent jobs from execution with the „MINI" startup. „Active" partitions are in disposition „K"

```
BG 0000 0I20I IPL COMPLETE FOR VSE/AF 5686CF906 52C  920 GA-LEVEL
BG 0000      SUPVR USERID IS: Z.VSE.SUPI
BG 0000 PRTY BG,FA,F9,F8,F6,F5,F4,F2,F7,FB,F3,F1
BG 0000 // JOB BGINIT
        DATE 04/08/2014, CLOCK 13/07/41
BG 0000 1I93I RECORDER FILE IS   1% FULL
BG 0000 IESI0221I PARTITIONS F3 F2 F1 WILL BE INITIALIZED IN RECOV START MODE.

BG 0000 IESI0222I REMAINING PARTITIONS WILL BE INITIALIZED IN WARM START MODE.
 IF YOU WANT TO INTERRUPT THEN ENTER MSG BG.
msg bg          ←
AR 0015 1I40I   READY
BG 0000 IESI0214I SELECT STARTUP MODE FOR SYSTEM : MINI  BASIC COLD.
BG 0000 IESI0215A OR, IF NO CHANGE, ENTER: END .
BG-0000
0 mini       ←
BG 0000 ALLOC F1=6M

BG 0000 STOP
F1 0001 // JOB POWSTART
        DATE 04/08/2014, CLOCK 13/08/02
F1 0001 * --------------------------------------------------------------
F1 0001 *   CAUTION:  MINI STARTUP JOB WILL EXECUTE IPWPOWER, WHICH IS NOT
F1 0001 *             GENERATED FOR SHARED SPOOLING.
F1 0001 *             IF OTHER SHARING SYSTEMS ARE EXECUTING THIS JOB MAY
F1 0001 *             DESTROY THE POWER QUEUE AND DATA FILE.
F1 0001 *             SHARING SYSTEMS SHOULD BE SHUT DOWN BEFORE PERFORMING
F1 0001 *             A MINI STARTUP.
F1 0001 *
F1 0001 *  1. REPLY "1 CANCEL (END/ENTER)" TO CANCEL THIS JOB
F1 0001 *  2. REPLY "1 (END/ENTER)" AT THE FOLLOWING PAUSE-STATEMENT TO
F1 0001 *     CONTINUE THIS JOB.
F1 0001 * --------------------------------------------------------------
F1-0001 // PAUSE
1
F1 0001 * ******* MESSAGE 1Q1CI MAY BE IGNORED !!!    *******
F1 0001 1QB7I   FULL QUEUE FILE RECOVERY IN PROGRESS
```

# How to get the time from Time-Of-Day (TOD) clock

- There are multiple ways to get the TOD clock value translated to day / time, e.g.
    - Use/write a REXX program
    - Write a program that uses the GETIME macro to translate the value

    - … or use the Attention Routine TIME command:

            TIME TOD=<first 4 byte of TOD clock value>

    returns the date and time.

    - Examples:

    time tod=CE8B684c
    AR 0015 TIME IS: 05:05:29 (GMT)          DATE 02/22/2015  SUNDAY

    time tod=CE8B684d
    AR 0015 TIME IS: 05:05:30 (GMT)          DATE 02/22/2015  SUNDAY

    time tod=CE911B8A
    AR 0015 TIME IS: 17:54:01 (GMT)          DATE 02/26/2015  THURSDAY

# Clock changes (Daylight Saving Time)

- SET ZONEDEF and SET ZONEBDY (IPL commands)
  - Switch between standard and daylight local times without changing the IPL startup procedure
  - IPL required in order to switch to the new time zone
  - See z/VSE System Control Statements for details.

- A local time change forward has normally no effect on subsystem operation. It may have an impact on accounting, however.
- A local time change backwards could affect subsystems and accounting routines more severely.
- Therefore I recommend to IPL the z/VSE system for any time changes.

- More information:
  - Technote "Daylight Saving Time changes effect on CICS".
    http://www-01.ibm.com/support/docview.wss?uid=swg21220678
  - z/VSE Hints & Tips, see section "System Date and Time".
    http://www-03.ibm.com/systems/z/os/zvse/documentation/#hints

# Some more tips

- Improve TCP/IP performance for z/VSE guests
  - Via the z/VM Queued Direct I/O (QDIO) assist
  - z/VSE exploits QDIO assist for OSA-Express (CHPID type OSD) and HiperSockets (CHPID type IQD)
  - QDIO instructions directly passed to the hardware
  - I/O interrupt directly passed from the hardware to the z/VM guest
  - Before IPL of the z/VSE system use CP command „SET QIOASSIST ON"
  - z/VM has to run in an LPAR
- z/VSE Supervisor (copy) buffer usage
  - Copy buffers are used for I/O processing, allocate in Supervisor area (24 bit storage)
  - Allocated based on the IPL command „SYS BUFSIZE"
  - IPL message displays the actual BUFSIZE value
  - SIR command shows the copy block usage, high water mark and MAX value

  ```
  AR 0015 COPY-BLKS = 00015          HIGH-MARK = 00041     MAX = 01502
  AR 0015 CHANO USED= 00004          HIGH-MARK = 00011     MAX = 00080
  ```

  - If high water mark is close to MAX, consider to increas the copy buffers
  - Copy buffer shortage may cause system hangs
  - More copy buffers may be needed
    - if you migrate from ECKD to SCSI
    - For VTAM 31 bit I/O buffers
- Concurrent microcode update recommended during maintenance window

# CICS on z/VSE

- Two different CICS products on z/VSE 4.2:

  - CICS/VSE 2.3
    - In service for about 17 years
    - End-of-Support (EOS) since October 2012
    - z/VSE 4.2: last release that includes CICS/VSE in z/VSE package
    - z/VSE 4.3: CICS/VSE access to DL/I does not work
    - z/VSE Version 5: CICS/VSE not supported (will not run on z/VSE Version 5)

  - CICS TS for VSE/ESA 1.1
    - In service for more than 14 years
    - Migration target for CICS/VSE
    - Recommendation: If you are still running applications on CICS/VSE, migrate them to CICS TS prior to the migration to z/VSE Version 5

- New CICS TS version with z/VSE 6.1: CICS TS for z/VSE 2.1

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

# Migration to a supported z/VSE release

- Please migrate to a supported z/VSE release
  to get the latest software service, hardware exploitation and functionality

- The only supported releases by 11/27/2015 are z/VSE 5.1, 5.2, 6.1
  - z/VSE 5.1, 5.2 require z9 or higher
  - <span style="color:red">z/VSE 5.1 end of service effective June 30, 2016.</span>
  - z/VSE 5.2 can still be ordered after z/VSE 6.1 GA, end of marketing not announced yet
  - Fast Service Upgrade (FSU) to z/VSE 5.1, 5.2 supported
  - z/VSE 6.1 requires an initial installation

  - Consider the Single Version Charging (SVC) requirements
    … and for z/VSE 6.1 Migration Price Option (MPO)

  - IBM System z software pricing:
    http://www-03.ibm.com/systems/z/resources/swprice/reference/

  - Migration white paper will be provided at z/VSE 6.1 GA

# z/VSE status

- z/VSE status web page: http://www-03.ibm.com/systems/z/os/zvse/about/status.html
  - Supported z/VSE release
  - z/VSE adapters and crypto
  - z/VSE storage support
  - z/VSE server support

## Supported z/VSE releases

| Version.Release | Date available | Withdrawal from Marketing effective (1) | Withdrawal from Service effective | Minimum z/VM level (2) |
|---|---|---|---|---|
| → z/VSE V5.2 | 04/25/2014 Announcement | TBD | TBD | z/VM V5.4 |
| → z/VSE V5.1 | 11/25/2011 Announcement | 05/23/2014 Announcement | 06/30/2016 Announcement | z/VM V5.4 |

# z/VSE status ...

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

# z/VSE status ...

- z/VSE status web page for old releases: http://www-03.ibm.com/systems/z/os/zvse/about/statusold.html

**Unsupported releases may run on these servers at user's risk** —

| IBM z Systems, IBM System z, zSeries and S/390 Server | 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 z13 (7) | Yes (6) | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM zEnterprise BC12 (7) | Yes (6) | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM zEnterprise EC12 (7) | Yes (6) | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM zEnterprise 114 | Yes (6) | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM zEnterprise 196 | Yes (6) | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM System z10 EC | Yes | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM System z10 BC | Yes | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM System z9 EC (formerly z9-109) | Yes | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| IBM System z9 BC | Yes | Yes (4) | Yes (4) | No (2) | No (2) | No (2) |
| zSeries 990/890 | Yes | Yes (4) | Yes (4) | Yes (4) | No (2) | No (2) |
| zSeries 900/800 | Yes | Yes | Yes | Yes | Yes | Yes |
| S/390 Parallel Enterprise Server G5/G6 (3) | No | Yes | Yes | Yes | Yes | Yes |
| S/390 Multiprise 3000 (3) | No | Yes | Yes | Yes | Yes | Yes |

# z/VSE Service & Support

- Service and support web page on http://www-03.ibm.com/systems/z/os/zvse/support/

- Hot service news shows important updates on our service and support web pages
  http://www-03.ibm.com/systems/z/os/zvse/support/#news

- Preventive service: information on
  - Service refreshes,
  - PSP buckets and
  - Recommended Service Levels (RSLs)
  - **New:** Security and system integrity
- Corrective service
  - Latest APARs per z/VSE component
- z/VSE security and system integrity APARs

- CICS TS for VSE/ESA 1.1.1 fix list ->
  http://www-01.ibm.com/support/docview.wss?rs=1083&uid=swg27015142

- Product Status of Independent Software Vendors (ISVs)
  http://www-03.ibm.com/systems/z/os/zvse/partners/

- IBM Software Support Handbook:
  https://www-304.ibm.com/support/customercare/sas/f/handbook/home.html

# 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 ?

# CICS TS for VSE/ESA fix list

- http://www-01.ibm.com/support/docview.wss?rs=1083&uid=swg27015142

# End of service announcements

- **z/VSE 5.1** withdrawn from service June 30, 2016.
  - Replacement product: z/VSE 5.2.

- **WebSphere MQ for z/VSE 3.0** withdrawn from service September 30, 2015.
  - Replacement product: none.
  - Individual service extension contracts can be requested for service beyond September 30, 2015 for a period of at least 3 years.
  - The WebSphere MQ Client for VSE continues to be available.

- **Emulation Program (EP) 1.14** withdrawn from service December 31, 2015.

- **z/VM 5.4** withdrawn from service December 31, 2016 or until z9 processors are withdrawn from support, whichever is later.
  - z/VM V5.4 not supported on z13; Replacement product: z/VM V6.

- **IBM Advanced Communication Function/System Support Program (ACF/SSP)** for VSE/ESA 4.x.x 5686-064 to be withdrawn from service on September 30, 2016

- IBM TCP/IP for VSE/ESA 1.5.0 5686-A04 Feature S001G2C - **NFS** for IBM TCP/IP for VSE/ESA to be withdrawn from service on September 30, 2016

# Service Management Connect – z/VSE

http://www.ibm.com/developerworks/servicemanagement/z/zvse/index.html

# z/VSE Events

- Next Conferences
  - 9th European GSE/IBM Technical University for z/VSE, z/VM and Linux on z Systems in Boeblingen, Germany – October 19-21, 2015
    Celebration of 50 years VSE
  - The latest news for conferences is here: http://www-03.ibm.com/systems/z/os/zvse/events/

- Live Virtual Classes (LVCs)
  - The latest news for LVCs are on the z/VSE education web page: http://www-03.ibm.com/systems/z/os/zvse/education/index.html
  - There are announcements for new LVCs as well as presentations and playbacks of completed ones.

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# Documentation related to z/VSE

- z/VSE documentation page - http://www-03.ibm.com/systems/z/os/zvse/documentation/
  - New books are uploaded: z/VSE 5.2 TCP/IP Support, z/VSE 5.2 Diagnosis Tools, z/VSE 5.2 Guide for Solving Problems, z/VSE 5.2 Supervisor Diagnosis Reference, z/VSE Hints & Tips

- z/VSE Collection Kit - April 2014
  - Available for download in IBM Publication Center; electonic only, not on physical DVD
- Documentation of z/VSE releases
  - z/VSE Internet Library on http://www.ibm.com/systems/z/os/zos/bkserv/vse.html

- New: z/VSE Knowledge Center

# New: z/VSE Knowledge Center

# CICS TS for VSE Knowledge Center

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CICS Transaction Server for VSE/ESA 1.1.1

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## CICS Transaction Server for VSE/ESA Version 1 Release 1

The CICS Transaction Server for VSE/ESA (CICS TS for VSE/ESA) belongs to the CICS Transaction Server family, supports large transaction volumes with fast, consistent response times and provides high availability and scalability at a low cost per transaction.
CICS TS for VSE/ESA provides direct access to CICS applications from the web. The CICS Explorer can be used to monitor the usage of resources on CICS TS for VSE/ESA.

Documentation for the IBM CICS Transaction Server for VSE/ESA is provided as downloadable PDF manuals from the ➵ IBM Publications Center.

**Learn more**
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- ➵ CICS Transaction Server for VSE/ESA 1.1 product information
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http://www-01.ibm.com/support/knowledgecenter/SSB2JE_1.1.1/welcome.html

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# Documentation related to z/VSE ...

- Technical articles:
  http://www-03.ibm.com/systems/z/os/zvse/documentation/documents.html#articles
  - New: Migrating from MQ Server on z/VSE to MQ Client
    using the z/VSE MQ Client Trigger Monitor
  - New: Big data and Hadoop with z/VSE
  - Getting started with mobile development for z/VSE
  - z/VSE SCSI Support and Migration Options
  - SHOWCB enhancements in z/VSE 5.1
  - z/VSE z/VM IP assist
  - Parallel Access Volume (PAV) white paper

- White paper
  - IBM 3270 emulation: security considerations
    http://www-01.ibm.com/common/ssi/cgi-
    bin/ssialias?subtype=WH&infotype=SA&appname=STGE_ZS_ZS_USEN&htmlfid=ZS
    W03276USEN&attachment=ZSW03276USEN.PDF#loaded

# IBM Redbook news

- IBM Redbook blog: 5 things to know - https://www.ibm.com/developerworks/community/blogs/5things/?sortby=0&maxresults=15&lang=en



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# IBM Redbook news ...

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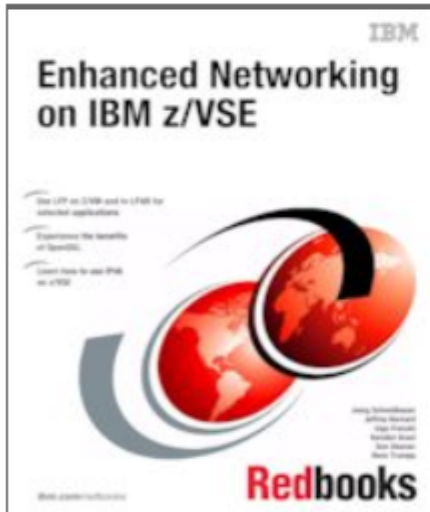
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# Enhanced Networking on IBM z/VSE

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▫ Saulo Silva

▫ David Borges De Sousa

▫ Livio Sousa

▫ Junius Mills

# z/VSE Requirements

- You may submit requirements at conferences (GSE, zUniversity (Edge), 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 = zSeries 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 = WebSphere*
    - *Product family = Transaction Processing*
    - *Product = CICS Transaction Server*
    - *Component = Runtime or Explorer*
    - *Operating system = IBM z/VSE*

# z/VSE in the internet

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

- z/VSE on Twitter: www.twitter.com/IBMzVSE

- 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

# More Information

… on VSE home page: http://ibm.com/vse

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

- Hints and Tips for z/VSE 5.2:
    - http://www.ibm.com/systems/z/os/zvse/documentation/#hints

- 64 bit virtual information: IBM z/VSE Extended Addressability,   Version 5 Release 2

- CICS Explorer: http://www.ibm.com/software/htp/cics/explorer/

- IBM Redbooks:
    - 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/Redbooks.nsf/RedbookAbstracts/sg247691.html?Open
    - z/VSE Using DB2 on Linux for System z
    -  http://www.redbooks.ibm.com/abstracts/sg247690.html?Open
    - New: Enhanced Networking on IBM z/VSE
      http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg248091.html?Open

- Please contact z/VSE: https://www-03.ibm.com/systems/z/os/zvse/contact/contact.html
  or me – Ingolf Salm – salm@de.ibm.com – for any questions

# Questions ?

# YOUR OPINION MATTERS!



1  2  3  4

# Submit four or more session evaluations by 5:30pm Wednesday to be eligible for drawings!

*Winners will be notified Thursday morning. Prizes must be picked up at registration desk, during operating hours, by the conclusion of the event.

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