

# IS01 - Latest news on IBM z/VSE

11th European GSE / IBM Technical University for z/VSE, z/VM, KVM and Linux on IBM z Systems

Hamburg, Germany

23 – 25 October, 2017

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

# z/VSE Roadmap

z/VSE releases in service

**z/VSE 6.2 GA planned for 12/01/2017**  
**z114 / z196 or higher**, zHPF / SIMD support, Tapeless installation SCSI / ECKD, CICS TS for z/VSE 2.2, security and connector enhancements

**z/VSE 6.1 Ann 10/ 05/2015, GA 11/27/2015**  
**z10 or higher**, CICS TS for z/VSE 2.1: CICS Explorer update, Channels & Containers; TCP/IP for z/VSE 2.1, IPv6/VSE 1.2, IBM Z exploitation

**z/VSE 5.2 04/2014, end of service 10/31/2018**  
**z9 or higher**, IBM Z exploitation, device support, Tapeless installation, networking / security enhancements

Unsupported z/VSE releases

**z/VSE 5.1 11/2011, end of service 06/30/2016**  
**z9 or higher**, 64 bit virtual, IBM Z exploitation,  
**z/VSE 5.1.1** 06/2012: CICS Explorer, LFP in LPAR, database connector  
**z/VSE 5.1.2** 06/2013: TS1140, 64 bit I/O, openSSL, db connector enhancements

**z/VSE 4.3 11/2010, end of service 10/31/2014**  
 Virtual storage constraint relief, 4 digit cuus, z/VSE 4.3.1 08/2011

**z/VSE 4.2 October 2008, end of service 10/31/2012**  
 More tasks, more memory, EF for z/VSE 1.1, CPU balancing, SCRT on z/VSE  
**z/VSE 4.2.1** 07/2009 - PAV, EF for z/VSE 1.2, **z/VSE 4.2.2** 04/2010 - IPv6/VSE 05/2010  
**CICS/VSE** end of service 10/31/2012

**z/VSE 4.1 March 2007, end of service 04/30/2011**  
**z/Architecture only**, 64 bit real addressing, MWLC – full and sub-capacity pricing

# IBM Z server support

- z890 server **end of service** October 31, 2016 - <https://ibm.biz/BdiaR5>
- zBC12 / zEC12 **end of marketing** announcement - <https://ibm.biz/BdiaFD>
- z13 / z13s are the last IBM Z servers to support running an operating system in **ESA/390 architecture mode**
  - all 24-bit and 31-bit problemstate application programs originally written to run on the ESA/390 architecture are unaffected by this change.
- z14 – IPL in z/Architecture mode only
  - In LPAR and z/VM 6.4 guest
    - z/VSE Version 6 and z/VSE 5.2, PTF required for z/VSE 5.1 in LPAR and z/VM guest
  - In z/VM 6.4 guest (ESA/390 – APAR VM65942)
    - z/VSE Version 4
  - Not possible to IPL z/VSE 3.1 or VSE/ESA releases
- z/VSE 5.2 last release that supports z9 BC / EC
- z/VSE 6.1 last release that supports **z10 server** family of servers
- z/VSE 6.2 can run on z114 / z196 or higher

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

## IBM Z server support – z/VSE

VSE Release	z800 / z900 z890 / z990	z9	z10	z196 / z114 / zEC12 zBC12 / z13 / z13s	z14	VSE EoM	VSE EoS
z/VSE V6.2	No	No	No	Yes	Yes	tbd	tbd
z/VSE V6.1	No	No	Yes	Yes	Yes	tbd	tbd
z/VSE V5.2	No	Yes	Yes	Yes	Yes	03/13/2017	10/31/2018
z/VSE V5.1	No	Yes	Yes	Yes	Yes (PTF)	05/23/2014	06/30/2016
z/VSE V4.3	Yes	Yes	Yes	Yes	z/VM guest	06/25/2012	10/31/2014
z/VSE V4.2	Yes	Yes	Yes	Yes	z/VM guest	10/26/2010	10/31/2012
z/VSE V4.1	Yes	Yes	Yes	Yes	z/VM guest	10/17/2008	04/30/2011
z/VSE V3.1	Yes	Yes	Yes	Yes	no	05/31/2008	07/31/2009
VSE/ESA V2.7	Yes	Yes	Yes	Yes	no	09/30/2005	02/28/2007
VSE/ESA V2.6	Yes	Yes	Yes	Yes	no	03/14/2003	03/31/2006

z/VSE release / hardware status: <http://www-03.ibm.com/systems/z/os/zvse/about/status.html>

## IBM Z server support (z9 or higher) – z/VM

z/VM Release	z9	z10	Z196 / z114 / zEC12 / zBC12	z13 / z13s	z14	VSE EoS
z/VM V6.4	No	No	Yes	Yes	Yes	tbd
z/VM V6.3	No	Yes	Yes	Yes	Yes	12/31/2017
z/VM V6.2	No	Yes	Yes	Yes	No	06/30/2017
z/VM V6.1	No	Yes	Yes	No	No	04/30/2013
z/VM V5.4	Yes	Yes	Yes	No	No	12/31/2017

z/VM status: <http://www.vm.ibm.com/techinfo/lpmigr/vmleos.html>

## Announcements: z/VSE ordering / end of marketing / service

- z/VSE 5.2 end of marketing (eom) was March 13, 2017
  - After end of marketing products can no longer be ordered.
  - eom announcement: <https://ibm.biz/BdiaE7>
  
- z/VSE 5.2 end of service (eos) is planned for October 31, 2018
  - The affected products are:
    - z/VSE 5.2
    - z/VSE Central Functions 9.2
    - CICS TS for VSE/ESA 1.1.1
    - IBM IPv6/VSE 1.1
    - IBM TCP/IP for VSE/ESA 1.5
  - eos announcement: <https://ibm.biz/BdiaEW>
  
- z/VSE 6.1 can be ordered via Shopz until z/VSE 6.2 is orderable – 11/28/2017

## 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.
- 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:
    - SCRT (Classic) support ends October 2017
    - SCRT V25.1.0 (Java)
      - Command line interface
      - Java-version, 32- and 64-bit Java supported on Windows & Linux
      - Download: <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=ZSL03435USEN>
    - **All reports submitted in November need to be generated with Java version**
    - z/VSE provides a sample on how to automate the SCRT process (data transfer)  
<http://www-03.ibm.com/systems/z/os/zvse/downloads/samples.html#rexx>
    - .. and a paper “Using SCRT (Java Version) with z/VSE” later this month
  - See web page for Monthly License Charge (MLC) programs  
<http://www-03.ibm.com/systems/z/resources/swprice/reference/exhibits/mlc.html>
- See MVM announcement letter for details: <https://ibm.biz/BdiaXF>



## z/VSE 6.1

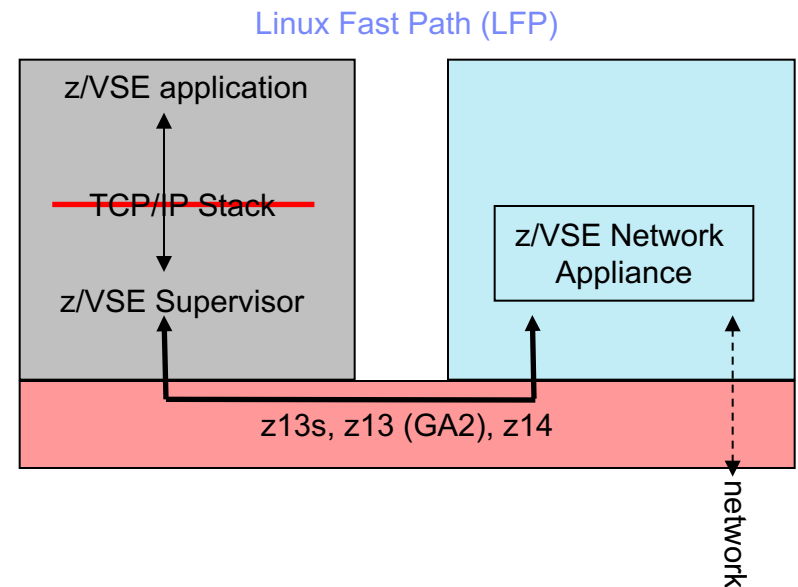
- Preview: May 11, 2015, GA ann.: 10/05/2015, GA 11/27/2015,  
Recommended Service Level (RSL) with cutoff June 30, 2017
  
- Hardware support
  - Architectural Level Set to IBM System z10 or later
  - IBM z13 / z13s / z14 (+ PTFs) support
  - z/VSE Network Appliance (VNA)
  - IBM System Storage options
    - Tape solutions
      - IBM TS7700 Virtualization Engine Release 4.0 (IBM TS7760)
    - Disk solutions
      - IBM System Storage DS8870 Release 7.5,
      - IBM System Storage DS8880 (DS8884, DS8886, DS8888)
        - As ECKD and FCP-attached SCSI disks
      - IBM FlashSystem V9000 for use with FCP-attached SCSI disks.

## z/VSE 6.1 ...

- New CICS version: CICS TS for z/VSE 2.1
  - CICS Explorer – monitor and update CICS resources
  - Channels & Containers to lift 32K Commarea limitation
  
- Networking enhancements (firewall support)
  - IBM IPv6/VSE 1.2 – new release
  - IBM TCP/IP for z/VSE 2.1 – new version
  
- Connectors
  - MQ Client Trigger Monitor
  
- z/VSE 6.1 requires an initial installation
  - Fast Service Upgrade (FSU) from z/VSE V5 not supported
  
- z/VSE 6.1 and follow-on releases are delivered in English only

## z/VSE Network Appliance (VNA)

- Available for z13 GA2 / z13s, z14
- VNA acts as a router for z/VSE
- TCP/IP application uses Linux Fast Path (LFP) and connects through HiperSockets to VNA
- Based on IBM Secure Service Container, delivered with z13 GA2 / z13s / z14
- No Linux license,  
No TCP/IP stack required on z/VSE,  
No z/VM required to connect to the network
- Supported with z/VSE V6, 5.2, works with 5.1
- VNA for LPAR only
- zVSE - z/VM IP Assist (VIA) for z/VM guests



## z/VSE 6.2

- Preview: 04/11/2017, GA announcement: 10/10/2017, GA planned for 12/01/2017
  
- Hardware support
  - Architectural Level Set to IBM zEnterprise 114 (z114) or IBM zEnterprise 196 (z196) or later
  
  - Support for
    - High Performance FICON (zHPF)
    - Vector Facility (Single Instruction Multiple Data - SIMD)
    - Elliptic Curve Cryptography (ECC) accelerated with CryptoExpress5S of z13 / z13s / z14, exploited by openssl
    - FlashCopy Space Efficient (SE) for Extent Space Efficient (ESE) volumes configured in an DS8880
    - Support for TS7700 R4.1.1
  
  - Tapeless initial installation using SCSI or FBA disks
  - Support for stand-alone dump on SCSI disks

## z/VSE 6.2 ...

- CICS TS for z/VSE enhancements
  - CICS Explorer enhancements (define programs, files, etc.)
  - Channels & containers enhancements
  - HTTP 1.1 upgrade for CICS Web Support (CWS)
  - Enhancements to the CICS Application Programming Interface (API).
  
- Connector enhancements
  - z/VSE SOAP engine to exploit Channels and Containers
  - new z/VSE Representational State Transfer (REST) engine with JSON (JavaScript Object Notation) support
  - z/VSE database connector enhancements

## z/VSE 6.2 ...

- Security enhancements
  - Basic Security Manager (BSM) enhancement
  - IUI dialog for batch resources (DTSECTAB security)
  - Upgrade to openssl 1.0.2h
  - openssl for online and batch environment, for CICS Web Support (CWS)
    - EZA multiplexer & EZA openssl support for any TCP/IP stack
  - Secure connection (SSL/TLS) for remote virtual tapes (VTAPES)
  - LDAP sign-on enhancements
  - PNET TLS 1.0 (and higher) connections

## z/VSE 6.2 ...

- Networking enhancements
  - Linux Fast Path (LFP) connectivity from z/VM guest to LPAR
  - IBM IPv6/VSE 1.3
  - IBM TCP/IP for z/VSE 2.2
  
- DL/I 1.12 enhancements (as PTF after GA)
  - DL/I partitioning for direct (HD) databases (removed 4GB segment type limitation)
  
- Product delivery of z/VSE on DVD and electronically only
  
- z/VSE 6.2 announcement letter: <https://ibm.biz/BdjKsH>

# High Performance FICON support in z/VSE

- High Performance FICON (zHPF) for ECKD devices only
  - Channel programs are translated to zHPF commands
  - Multiple channel commands are sent as a single entity to the control unit
  - May reduce overhead and increase I/O rates on the channel
  - Available on all z/VSE 6.2 supported servers
  
- z/VSE
  - Supports zHPF implementation phase 1
  - Translates a subset of CCW commands (define extent, locate record, TIC, ...)
  - I/O APIs will not change, translation occurs at low level I/O interfaces
  
  - If transport mode I/O results in an I/O error, the request will be retried in command mode
  - LPAR and z/VM guests supported (z/VM APAR may be required)



# High Performance FICON support in z/VSE ...

## ▪ Interfaces

- SYSDEF SYSTEM command extended to start / stop the zHPF support
  - SYSDEF SYSTEM,ZHPF=START
  - SYSDEF SYSTEM,ZHPF=STOP
- zHPF support may be started, stopped or restarted any time
  - Can be used to verify, if the workload benefits from z/VSE's zHPF support
- The SIR SMF command shows the I/O counters

## ▪ Benefits

- Transparent to applications
- May improve I/O performance
- Highly dependent on workload characteristics

## Vector Facility support in z/VSE

- Vector Facility also called Single Instruction Multiple Data (SIMD)
  - New set of vector instructions described in the z/Architecture Principles of Operation
  - Vector instructions work on 32 128-bit registers
  - Vector registers are partially shared with floating point registers
  - Available on z13 / z13s / z14
  
- z/VSE
  - Instructions can be exploited by assembler applications
  - z/VSE uses 31-bit vector register save area to save / restore status
  - Application has to activate / deactivate vector register support via VECTOR macro
    - Activate allocates save area for task / partition, deactivate frees save area virt. storage
    - To save 31-bit virtual storage, if vector registers are not used
  
  - LPAR and z/VM guests supported (z/VM APAR may be required)
  
- Benefits for applications, that exploit vector instructions
  - May improve performance
  - Highly dependent on workload characteristics

# Enhancements for SCSI device support

- Tapeless installation
  - Available since z/VSE 5.2 for ECKD
  - Tools provided to create an installation disk (supported for LPAR and z/VM guest)
  - Installation disk
    - Contains a boot program and the z/VSE base tape in AWS file format
    - Created on LPAR may be used by a z/VM guest or vice versa
    - LPAR: create installation disk by using the DVD with the HMC or SE Load function
  - Installation from installation disk possible on ECKD, FBA and FBA-SCSI
  - Files required for the creation of the installation disk delivered on DVD or via the Internet
  - Tapeless installation enhanced for installation disk on **FCP-attached SCSI devices**
  - Installation on ECKD, FBA and FCP-attached SCSI disks supported
  - Supports initial installation only
  
- Stand-alone dump
  - Can be created on tape or disk device
  - Currently only stand-alone dump to ECKD or FBA disks are supported
  - z/VSE 6.2 will support stand-alone dump to SCSI disk

# CICS TS for z/VSE 2.2 – CICS Explorer

- CICS Explorer
  - Monitoring with z/VSE V5, monitoring and update with z/VSE V6
  - System management framework for CICS TS
  - Consists of CICS Explorer client and a CICS TS server extension
  - CICS Explorer client
    - Eclipse-based user interface on workstation
    - Connects to CICS TS via TCP/IP - Communication via HTTP requests
    - One CICS Explorer client for z/VSE and z/OS
  
- CICS Explorer enhancements
  - Definition of new CICS resources (programs, files, transactions)
  - Change / delete existing CICS resources
  - Definition view of client for selected CICS resources
  
  - Monitor, control or update
    - Dynamic storage areas
    - Global temporary storage queue statistics

## CICS TS for z/VSE 2.2 – Channels & Containers

- z/VSE ported channel and container APIs from CICS TS for z/OS 3.1
- Channels and containers lift the 32K Commarea limitation
  - Applicable for both LINK and XCTL, Distributed Program Link (DPL)
  - Local and transaction routing
  - START with data
- Language support is provided for C, COBOL, HLASM, and PL/I.
- Channels and Containers limitations
  - In 31 bit virtual storage only
  - No support for
    - External CICS Interface (EXCI), External Call Interface (ECI), CICS Web Support (CWS)

# CICS TS for z/VSE 2.2 – Channels & Containers

## ■ Container

- Named block of data designed for passing information between programs
  - Like named COMMAREAs
- CONTAINER API
  - Created using (EXEC CICS) PUT CONTAINER, defines the size of the container
  - Read using (EXEC CICS) GET CONTAINER
  - Delete using (EXEC CICS) DELETE CONTAINER, to free storage
- No CICS enforced size limitation
- Containers are stored within the CICS EDSA (31 bit partition virtual storage)

## ■ Channel

- A group of Containers - no limit on the number of Containers in a Channel
- A Channel is a sort of program interface
  - Passed on LINK, XCTL, pseudoconversational RETURN, and START commands
- Non-persistent - non-recoverable resource similar to COMMAREAs

# CICS TS for z/VSE 2.2 – Channels & Containers

- Channel and container enhancements
  - Support UTF-8 and UTF-16 in code page conversion  
On PUT CONTAINER and GET CONTAINER as source and target code page
  - Add the APPEND parameter for PUT CONTAINER  
to append the specified data to existing data in a container
  - Add the BYTEOFFSET parameter for GET CONTAINER  
to retrieve data beginning at a specified offset in a container

## CICS TS for z/VSE 2.2 - HTTP 1.1 support

- Upgrade of CICS Web Support (CWS)
- Ported from CICS TS for z/OS 3.1, CICS acting as a server
- Supports latest web browsers and applications
- TCPIP SERVICE PROTOCOL(HTTP|ECI|USER) for port 80 / 443
  
- Improves performance and security
  - Persistent connections
    - Keeps connections open (SOCKETCLOSE hmmmss)
    - Avoids overhead for open / close connection
  - Pipelining
    - Sends multiple requests without waiting for response
    - Response must be returned in the same sequence as request was received
  - Chunking
    - Messages send in chunks each with ist own size and data
  
- Support for
  - OPTIONS method
    - To get capabilities of the server without requesting a resource
  - TRACE method
    - Client can see what the other end received



## CICS TS for z/VSE 2.2 enhancements ...

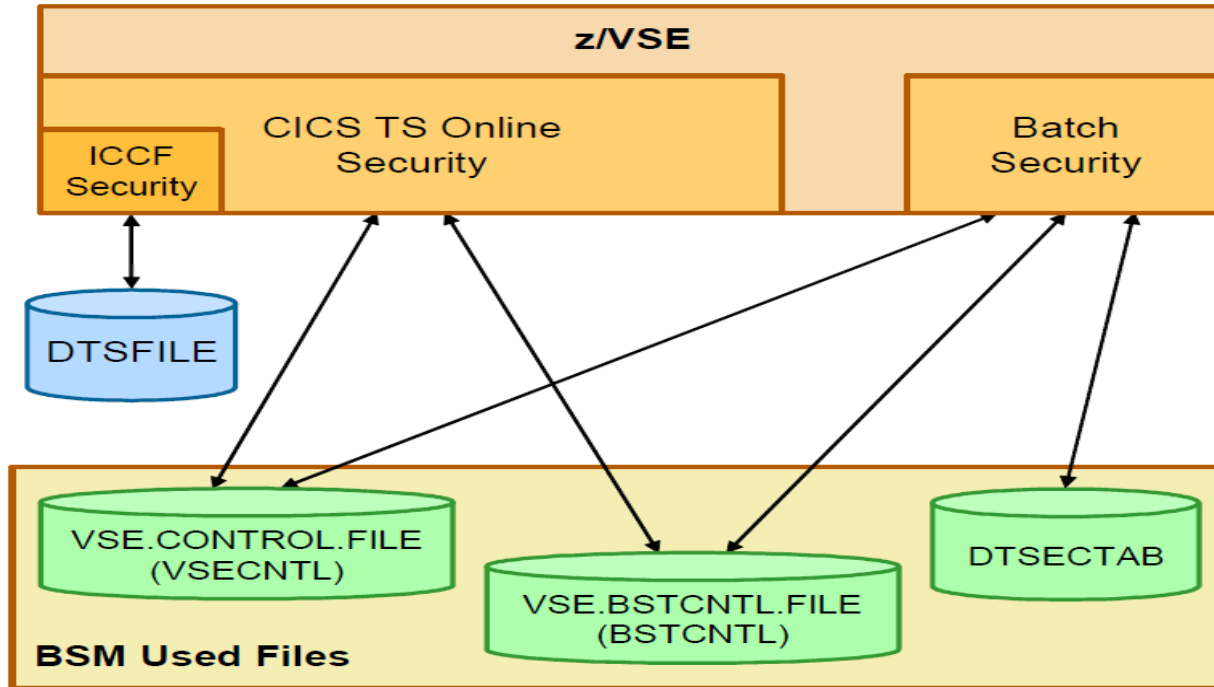
- Relative addressing instructions in Assembler programs (without base register)
  - New operands added to DFHEIENT and DFHEIRET macros
  - Beneficial for translated programs that are greater than 4095 bytes
  
- Common date and time stamp formats used on the internet
  - Define correct date and time stamp in HTTP header
  - New CONVERTTIME command and new option for FORMATTIME
  
- Language Environment (LE) MAIN for Assembler applications
  - New translator option LEASM to enable LE functions and setup LE environment
  - Assembler programs translated with LEASM can be used as  
task-related user exits (TRUEs) or global user exits (GLUEs)
  
- New SIT parameter: MAXSOCKETS
  - Specifies the maximum number of IP sockets, that can be handled by CICS

## z/VSE 6.2 Security enhancements

- OpenSSL enhancements
  - Upgraded to openssl 1.0.2h (newer SSL/TLS functions)
  - Elliptic Curve Cryptography (ECC) hardware acceleration with CryptoExpress5S / 6S
    - If hardware not available, ECC software implementation will be used
  - CICS Web Support : SSL/TLS support of openssl or SSL of TCP/IP for z/VSE stack
    - Does not need LE environment
- EZA Multiplexer and EZA openssl support
  - EZA multiplexer can be configured to use interface phase for given TCP/IP stack
  - OpenSSL may be used independent of the TCP/IP stack
  - Similar to the LE/C TCP/IP socket API multiplexer
- SSL/TLS connection to secure remote VTAPE network transfer
- Operator interface for crypto device driver when BSM is not used

## z/VSE 6.2 Security enhancements ...

- Basic Security Manager (BSM) uses the following files to store security related information
  - VSE Control File – central repository for user profiles (e.g. userid)
  - BSM Control File – profiles for resource classes
    - CICS resources: transactions, programs, files, journals, temp. storage queue, transient data queue, ...
    - VTAM applications, MQ resources, Facility (e.g. VSAM IDCAMS)



IBM Redbook “Security on IBM z/VSE” <http://www.redbooks.ibm.com/abstracts/sg247691.html?Open>

## z/VSE 6.2 Security enhancements ...

- Basic Security Manager (BSM) ...
  - Repositories for online and batch security (VSE / BSM control file, DTSECTAB)
  - Batch resources protected via DTSECTAB phase
  - z/VSE 6.2 provides a common interface for online and batch resources via IUI dialogs
    - New dialogs generate the DTSECTAB
  
- LDAP sign-on enhancements provide
  - RESET option for LDAP user mapping tool to clear cached user password hash
    - Forces full LDAP sign-on at next user sign-on
  - Wildcard support for CHANGE and DELETE commands of user mapping tool

# Connector enhancements

- z/VSE SOAP Engine to exploit channels and containers
  - Additional option to use channels and containers instead of CICS COMMAREA
  - z/VSE as SOAP client
    - SOAP engine detects automatically,  
if it was called with COMMAREA or channels & containers
  - z/VSE as SOAP server
    - COMMAREA or channels and containers use dependent on
      - New option passed with message or in RULES
      - Default is COMMAREA

## Connector enhancements ...

- z/VSE web services enhancements
  - New z/VSE REST Engine with JavaScript Object Notification (JSON) support
  - z/VSE implements Representational State Transfer (REST) engine
  - Allows clients to provide RESTful web services running in a CICS environment
  - JSON and XML supported
  
- z/VSE database connector DBCLI (Database Call Level interface) enhancements
  - Supports languages Assembler, COBOL, PL/I, C and REXX
  
  - Batch query tool - // EXEC IESDBCLI
    - Allows to connect to a database, execute query commands and retrieve results
  - Interactive query tool via CICS transaction IDBT
  - CICS REXX support for DBCLI

# Networking enhancements

- z/VSE Linux Fast Path (LFP) enhancements
  - LFP running as z/VM guest can communicate with with a TCP/IP stack in LPAR or the z/VSE Network Appliance (VNA)
  
- IBM IPv6/VSE 1.3
  - New FTP server security interface
    - FTP access to z/VSE file system may be protected by Basic Security Mager (BSM) or External Security Manger (ESM) using the resource class FACILITY
  
  - SSH copy facility
    - Uses a Linux pass-through image for a SSL connection to a remote host
    - Secure file transfer via SSH to and from z/VSE
    - Compatible with IBM TCP/IP for z/VSE, LFP, z/VM IP Assist (VIA) and VNA
  
  - TXT2PDF generation facility
    - Based on open source txt2pdf
    - Converts a text file into a Portable Docment Format (PDF) file
  
- IBM TCP/IP for z/VSE 2.2
  - Enhanced security with TLS 1.1 and TLS 1.2 support

## 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 releases
  - 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.

## Documentation related to z/VSE

- z/VSE documentation page - <http://www-03.ibm.com/systems/z/os/zvse/documentation/>
  
- 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
  
- 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](http://www.ibm.com/support/knowledgecenter/SSB27H/zvse_welcome.html)
  
- CICS TS for z/VSE Knowledge Center:  
<https://www.ibm.com/support/knowledgecenter/SSECAB>

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

# Documentation related to z/VSE ...


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## Migration to CICS Transaction Server for z/VSE V2. An IBM Redbooks publication

Published 10 May 2017



ISBN-10: 0738442461  
 ISBN-13: 9780738442464  
 IBM Form #: SG24-8390-00  
 (282 pages)

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## Documentation related to z/VSE ...

- Technical articles:  
<http://www-03.ibm.com/systems/z/os/zvse/documentation/documents.html#articles>
  - z/VSE release & hardware upgrade
  - z/VSE SCSI Support and Migration Options
  - z/VSE z/VM IP assist
  - Parallel Access Volume (PAV) white paper
  
- Hints and Tips for z/VSE 6.1:  
<http://www.ibm.com/systems/z/os/zvse/documentation/#hints>
  
- SCRT samples: Transfer SCRT89 records via the Host Transfer File  
<http://www-03.ibm.com/systems/z/os/zvse/downloads/samples.html#rexx>
  
- IBM DOC Buddy mobile app (Android, iOS) for search of error messages  
<https://ibmdocbuddy.mybluemix.net/>

## Session reference links

- z/VSE Homepage: [www.ibm.com/vse](http://www.ibm.com/vse)
- Ingolf's z/VSE blog: [www.ibm.com/developerworks/mydeveloperworks/blogs/vse/](http://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>
- Hints and Tips for z/VSE 6.1: <http://www.ibm.com/systems/z/os/zvse/documentation/#hints>

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