z/VSE Business, Status and Strategy Update

VM Workshop 2022

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How everything started



System/360 – Announced April 7, 1964

In the most important product announcement in company history to date, IBM introduces the IBM System/360 - a new concept in computers which creates a "family" of small to large computers incorporating IBM-designed Solid Logic Technology (SLT) microelectronics and uses the same programming instructions. The concept of a compatible "family" of computers transforms the industry.



"(System/360) was the biggest, riskiest decision I ever made, and I agonized about it for weeks, but deep down I believed there was nothing IBM couldn't do."

Father, Son & Co. 1990
Tom Watson, Jr.
IBM President 1952
IBM President and CEO 1956
IBM Chairman and CEO 1961-1971

How it began

Plan was to deliver a single operating system, OS/360 OS/360 project was falling behind schedule

When finally released, a year late, it required at least 64 KB of memory

Model	Announced	First Shipped		
30	April 7, 1964	June, 1965		
40	April 7, 1964	April, 1965		
50	April 7, 1964	August, 1965		

IBM System/360 Model 30

Typical arithmetic operations per second:

- Decimal add (5 + 5 digits) 13,300
- Fixed point add (32 bits) 34,500

Memory sizes:

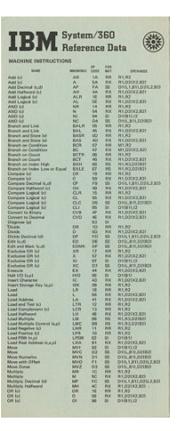
- 8K, 16K, 32K, 64K



DOS/360 – the first S/360 operating system

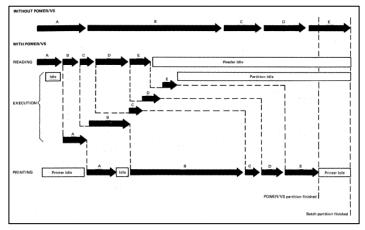
DOS/360 became available in 1965

- Designed for use of little memory
- Required approximately 6KB for system residence (supervisor)
- A minimum configuration consisted of
 - o Model 30 with 16K memory
 - o IBM 1052 printer keyboard
 - Card reader
 - o Printer
 - Punch
 - o One IBM 2311 disk drive (7.25 MB removable pack)
- User programming in
 - o Macro Assembler
 - o COBOL
 - Fortran
 - PL/I (designed for 32K systems)
 - o RPG (Report Program Generator)
- One partition
 - o Up to three with release 3
 - o BTAM for telecommunications added with release 3



DOS/VS - DOS with Virtual Storage support

- Releases 28 **→** 34
- Up to 16 MB virtual storage
- 5 partitions (up to 7 in release 34)
- Linkage Editor, Relocation Loader for effective multiprogramming
- POWER for I/O spooling (Priority Output Writers, Execution Processors, and Input Readers)
- New VSAM file system
- 'DBDC' → CICS and DL/I



Processing Jobs A – E Without and With POWER/VS



DOS/VSE – "extended" version of DOS/VS

- Up to 12 partitions
- ICCF Interactive Interface as an integral part of VSE
- ACF/VTAM became a component of VSE
- Maintain System History Program (MSHP) to install programming packages, APAR/local fixes, and service tapes
- Support of FBA disk devices
- Last free version of DOS
- Use of punched cards began to fade

In 1979, an imaginary DOS/VSE customer might have

- a 4331 system with 512K bytes main memory
- 6 IBM 3310 FBA disk drives (65 MB per drive) or
- 4 IBM 3340 CKD disk drives (35/70 MB removable packs)
- 2 IBM 8809 reel-to-reel tape drives
- 1 IBM 3203 line printer





SSX/VSE - Small System Executive

A pre-generated, pre-configured VSE operating system for the 4321, 4331, 4341, and 4361 systems

Designed for ease of installation, operation and use

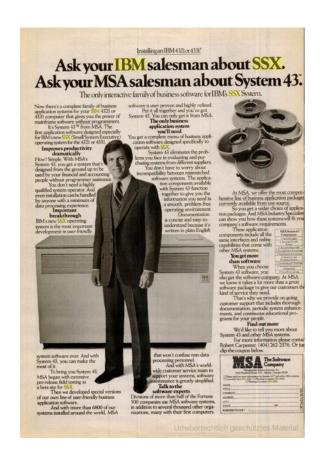
SSX/VSE consists of VSE components and unique prompters and aids

Tested as a single product including

- Assembler, POWER, CICS/VS, ICCF, IPF, ACF/VTAM, VSE/VSAM, Sort/Merge, DITTO, Fast Copy, OCCF, IPCS, COBOL
- plus optional products

SSX integration approach was too rigid for most customers

VSE/SP refined the concept



VSE/SP – System Product

- Integrated, pre-packaged VSE system
- 'SIPO' concept (System Installation Productivity Option)
- Fast Service Upgrade (FSU) made release-to-release migration simpler
- VSE/SP V3 (1987):
 - Packaging concept of 'Base' and 'Optional' products
 - 'Base' is an integrated package containing key, commonly used products
 - 'Optional' products are coordinated and shipped and serviced with the Base
 - 12 partitions
 - Virtual Address Extensions (VAE) supporting up to 9 address spaces
 - New Librarian
 - Interactive User Interface (IUI)
 - Conditional JCL

```
BG 0000 * STEP 0 EXECUTED
BG 0000 * STEP 1 EXECUTED
BG 0000 * STEP 2 EXECUTED
BG 0000 * STEP 1 EXECUTED
BG 0000 * STEP 2 EXECUTED
BG 0000 * STEP 3 EXECUTED
BG 0000 EOJ DPPETE
```

Figure 3: Console Listing Showing the Order of Program Execution

```
CATALOG PROC2.PROC REPLACE=YES DATA=YES
// GOTO &STEP
/. STEP0
* STEP 0 EXECUTED
/. STEP1

    STEP 1 EXECUTED

* STEP 2 EXECUTED
// IF $RC EO '0000' THEN
/. STEP3
* STEP 3 EXECUTED
CATALOG PROC3.PROC REPLACE=YES DATA=YES
// GOTO &STEP
/. STEP4
* STEP 4 EXECUTED
/. STEP5
* STEP 5 EXECUTED
/. STEP6
* STEP 6 EXECUTED
/. END
```

Figure 4: Branch Forward Procedure

VSE/ESA Version 1 was introduced with the ES/9000

"Project Blue" announcement in 1990: IBM Enterprise System/9000

New ES/9000 processor family: ES/9021, ES/9121, ES/9221

ESCON channels

Enterprise Systems Architecture (ESA)

- MVS/XA → MVS/ESA
- VM/XA SP → VM/ESA
- VSE/SP → VSE/ESA







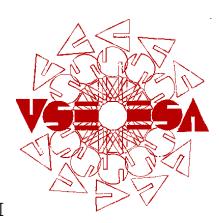
VSE/ESA

VSE/ESA V1

- 31-bit real memory support, then added 31-bit virtual addressing
- Dynamic partitions
- Virtual storage constraint relief (VSCR)
 - Move ACF/VTAM and POWER out of shared partitions
 - Dynamic channels (XA channel subsystem)
 - Up to 1024 devices for added I/O bandwidth
- ESA exploitation (later releases)
 - ESA data spaces
 - Virtual disk in storage
 - ESA access registers
- New versions of CICS/VSE, ACF/VTAM, VS COBOL II
 - For greater MVS affinity

In 1993, an imaginary VSE/ESA customer might have

- a ES/9221-150 system with 128 MB main memory
- 8 IBM 9336 disk drives (470 MB per actuator in early models)
- IBM 3490 tape unit





VSE/ESA Version 2

- VSE/ESA V2.2 (1996)
 - Year 2000 ready
- VSE/ESA V2.3 (1997)
 - optional Turbo dispatcher, support for n-way processors
 - VSAM KSDS > 4GB
 - TCP/IP for VSE/ESA (native), offered under agreement with CSI
 - ACF/VTAM V4.2
 - LE and LE-based languages: COBOL, PL/1, C for VSE/ESA
- VSE/ESA V2.4 (1999)
 - CICS Transaction Server (TS)
 - Affinity with OS/390 CICS
- VSE/ESA V2.5 (2000)
 - Connectors (VSE and Java-based components)

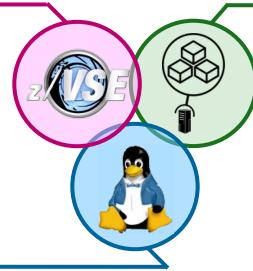


Introducing the new z/VSE Strategy

Protect existing

investments

Legacy applications and data on z/VSE



Extend for new workloads

Use the combination of Linux on System z and z/VSE

Integrate with

other Systems

Connect to, and run backend System z applications z/VSE Connectors to Java capable clients

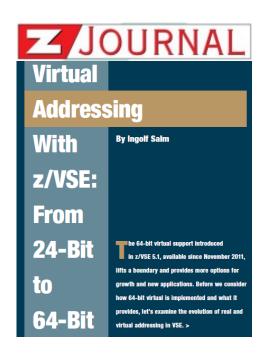
The basic z/VSE strategy is as simple as **PIE**:

- Protect
- Integrate
- Extend



z/VSE

- z/VSE V3
 - 31-bit mode only
 - No z/Architecture, no 64-bit mode
 - FCP-SCSI support
- z/VSE V4
 - 64-bit real memory addressing
 - No support of 64-bit virtual memory addressing
 - Fast Path to Linux on System z
- z/VSE V5
 - 64-bit virtual memory addressing
- z/VSE V6
 - New CICS



z/VSE evolution

z/VSE V6

- 4Q 2015
- ALS to System z10 (and higher)
- New CICS TS (channels & container)
- CICS Explorer enhancements

z/VSE V5.2

April 25, 2014

- zEnterprise exploitation, DVD base install
- Networking & security enhancements
- SoD for CICS TS enhancements, z/VSE V6

z/VSE V5.1.2

Jun 14, 2013

- 64-bit I/O, security & DBCLI enhancements
- SoD for IPv6/VSE pricing, DVD base install

z/VSE V5.1.1

Jun 15, 2012

- CICS Explorer Monitoring
- LFP in LPAR, DBCLI connector

z/VSE V5.1

Nov 25, 2011

- z196 / z114 exploitation
- ALS to System z9 (and higher)
- 64-bit virtual addressing, LFP w/ z/VM
- SoD for CICS Explorer, LFP in LPAR

z/VSE V4.3

Nov 26, 2010

- Virtual storage (24-bit) constraint relief
- 4-digit device addressses, IPv6/VSE
- Security / Crypto / Networking enhancements

z/VSE V4.2

Oct 17, 2008

- . More tasks, PAV, SVC, SCRT, LDAP Client
- SoD for CICS/VSE, RBD V7, WMQ V3

z/VSE V4.1

March 16, 2007

- z/Architecture only / 64-bit real addressing
- MWLC full & sub-cap pricing

z/VSE V3.1

March 4, 2005

- selected zSeries features, FCP/SCSI
- 31-bit mode only

VSE/ESA V2.7

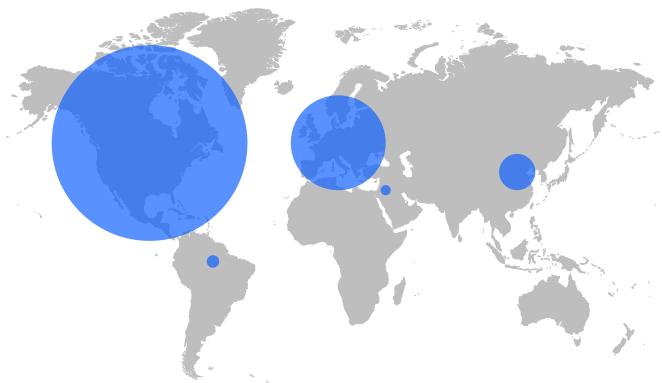
March 14, 2003

enhanced interoperability



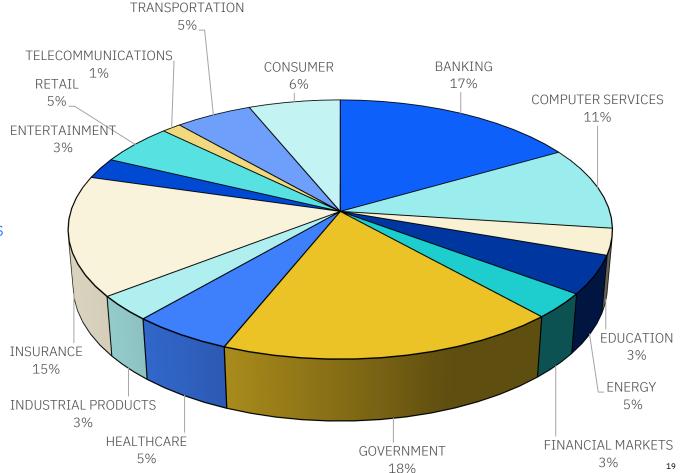
Business Worldwide

z/VSE drives the business everywhere*.



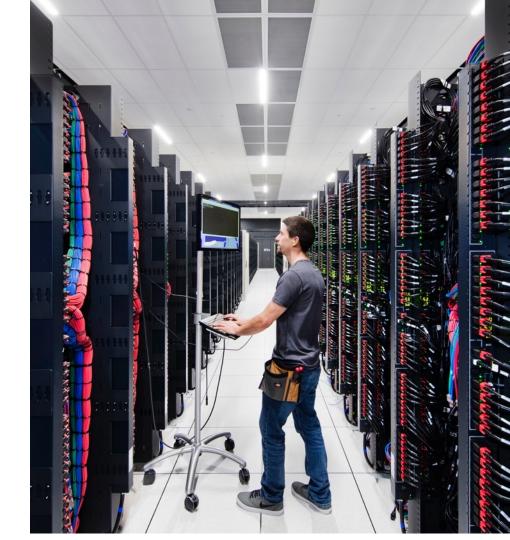
* the bigger the circle, the more customers in the geo

Industries



z/VSE remains important for all kind of different industries

Where are we today



Roadmap

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There were two important announcements at the 7th of June:

- RFA77533 IBM Z platform Software withdrawal
- RFA77609 Statement of Direction:
 z/VSE 6.2 support for the IBM z16

EOM Announcement

EOM of z/VSE 6.2 announced

z/VSE Continuous Delivery

DL/I 1.12.1 with support for >4GB partitions, DL/I recovery, PAV support for ICKDFS FlashCopy, *OpenSSL TLS 1.3, Networking, Security,*

21

z/VSE 6.2 GA: 1.12.2017

z114/z196 or higher, HW exploitation, CICS TS 2.2 (HTTP 1.1) & CICS Explorer, RESTfull Engine, Easy of use, Networking and Security enhancements

z/VSE 6.1 GA: 27.11.2015 (end of service: 30.6.2019) CICS TS for z/VSE 2.1: CICS Explorer update, Channels & Containers; TCP/IP for z/VSE 2.1, IPv6/VSE 1.2, z10 or newer; z Systems exploitation

z/VSE 5.2 GA: 25.4.2014 (end of service: 31.10.2018)

zEnterprise exploitation, device support

Tapeless installation, networking / security enhancements

z/VSE 5.1 GA: 11.2011 (end of service: 30.6.2016)

64 bit virtual, zEnterprise exploitation, z9 or newer

z/VSE 5.1.1 GA: 6.2012: CICS Explorer, LFP in LPAR, database connector

z/VSE 5.1.2 GA: 6.2013: TS1140, 64 bit I/O, openSSL, db connector enhancements

z/VSE 6.2 and IBM z16

z/VSE benefits from the HW features of the new z16

- System Recovery Boost
- Faster I/O with the FICON Express 32S
- IBM Fibre Channel Endpoint Security, which provides server authentication and data encryption
- New OSA-Express7S 1.2
- Better performance with HW Encryption with Crypto Express8S

The IBM z16 (machine type 3931, announced at the 5th of April 2022) will be the last machine which is supported by IBM z/VSE 6.2

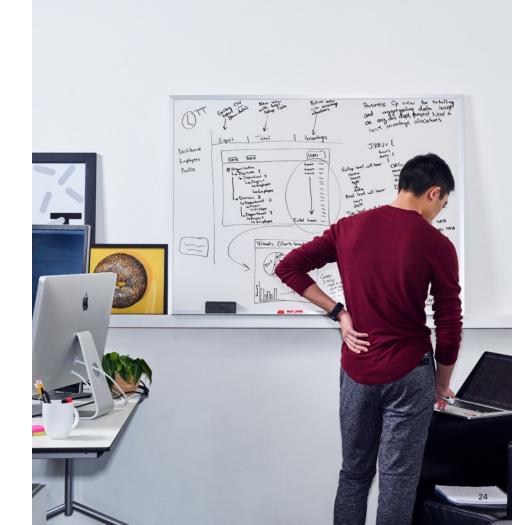


z/VSE Support for IBM Mainframe Servers



IBM Servers	z/VSE 6.2	z/VSE 6.1 (out of service)	z/VSE 5.2 (out of service)	z/VSE 5.1 (out of service)	z/VSE 4.3 (out of service)
IBM z16	~	>	V	>	>
IBM z15 & z15 Model T02	~	Y	~	>	¥
IBM z14™ & z14 Model ZR1	~	>	~	>	>
IBM z13® & z13s™	~	>	~	>	>
IBM zEnterprise® EC12 & BC12	~	Y	~	>	V
IBM zEnterprise® 196 & 114	~	~	~	¥	V
IBM System z10° EC & z10 BC	×	>	~	>	>
IBM System z9® EC & z9 BC	×	×	~	¥	V
zSeries® 990, 890	×	×	×	×	V

How the future will look like

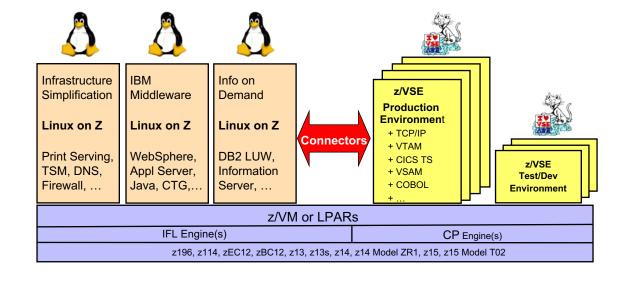


Strategy change

- Everybody knows the z/VSE P.I.E. strategy
- Last year we announced our partnership with 21st Century Software

https://www.21stcenturysoftware.com/license-z-vse-code-from-ibm/

 In March 21st Century Software announced their first version of the VSE operating system: VSEⁿ 6.3 https://www.21stcenturysoftware.com/21st-century-software-announces-vsen-v6-3/





Future of IBM z/VSE & 21st Century Software

Requests for **future enhancements** to the VSE Operating System and stack elements should be submitted to **21**st **Century Software**.

IBM z/VSE 6.2 will not support future hardware, but we enabled 21st Century Software to be able to take over.

IBM **continues to support** the existing IBM z/VSE Operating System and IBM stack products.



More News & Resources



IBM Websites

Marketing pages... Landing page:

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

Marketplace pages... Products that are sold and high level information about it:

https://www.ibm.com/us-en/marketplace/zvse

ShopZ:

http://www-304.ibm.com/software/shopzseries/ShopzSeries_public.wss

Documentation:

https://www.ibm.com/docs/en/zvse/6.2



Redbooks and White Papers

Overview:

https://www.ibm.com/docs/en/zvse/6.2?topic=technical-articles-whitepapers

Redbook: Introduction to the New Mainframe: IBM z/VSE Basics

http://www.redbooks.ibm.com/abstracts/sg247436.html?Open

Redbook: Migration to CICS Transaction Server for z/VSE V2.1

http://www.redbooks.ibm.com/abstracts/sg248390.html?Open

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

How to use REST support on z/VSE for access to IBM MQ REST API

ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/VSE2RESTMQ.pdf



Service & Support

Support overview:

http://www-01.ibm.com/support/docview.wss?uid=isg3T1027442

Supported release status:

https://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/zVSE_Status.pdf

Unsupported releases:

https://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/zVSE_Status_Unsupported.pdf

IBM Software lifecycle:

https://www.ibm.com/support/lifecycle/



Tools & other useful stuff

z/VSE Modern Solutions/Use Cases

https://www.ibm.com/docs/en/zvse/6.2?topic=use-cases

Connectors and Tools:

https://www.ibm.com/it-infrastructure/z/zvse-downloads https://www.ibm.com/docs/en/zvse/6.2?topic=developing-e-business-applications

Upcoming events:

https://www.ibm.com/it-infrastructure/z/zvse-resources

Jens'z/VSE blog:

https://ibm.biz/zvse-blog

VSE-L discussion list:

https://groups.google.com/forum/?fromgroups#!forum/bit.listserv.vse-l



Thank you

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