z/VSE 6.2 technical update

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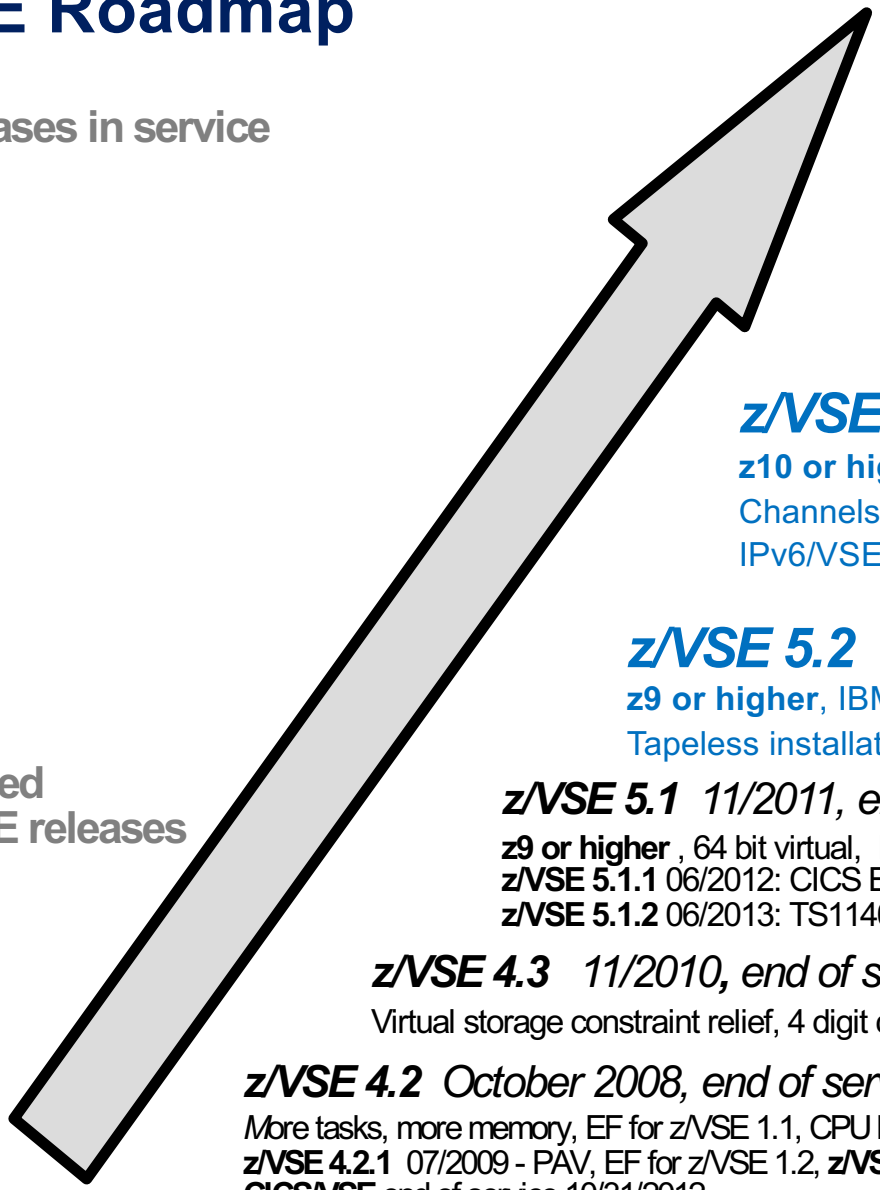
Ingolf's z/VSE blog: https://www.ibm.com/developerworks/mydeveloperworks/blogs/vse/

z/VSE Roadmap

z/VSE releases in service

Unsupported z/VSE releases



Continuous delivery

06/22/2018 ***DL/I 1.12.1 partitioning***

z/VSE 6.2 *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 *11/2015, end of service 06/30/2019*

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

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

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 / 6S of z13 / z13s / z14 / z14 ZR1, exploited by openSSL
    - FlashCopy Space Efficient (SE) for Extent Space Efficient (ESE) volumes configured in an DS8880
    - Support for TS7700 R4.1.2
  - 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
  - LDAP sign-on enhancements
  - Secure connection (SSL/TLS) for remote virtual tapes (VTAPEs)
  - 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://www-01.ibm.com/common/ssi/cgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=897/ENUS217-203&appname=USN

High Performance FICON support

- 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 …

- 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

- 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 / z14 ZR1

- 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

SCSI device support enhancements

- 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 TS for z/VSE 2.2 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

- Channel and container APIs from CICS TS for z/OS 3.1
  - Available since z/VSE 6.1 (CICS TS for z/VSE 2.1)
- 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
- TCPIPSERVICE PROTOCOL(HTTP|ECI|USER) for port 80 / 443

- Improves performance and security
  - Persistent connections
    - Keeps connections open (SOCKETCLOSE hhmmss)
    - 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 its 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

More 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 con 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

Pervasive Encryption with z/VSE

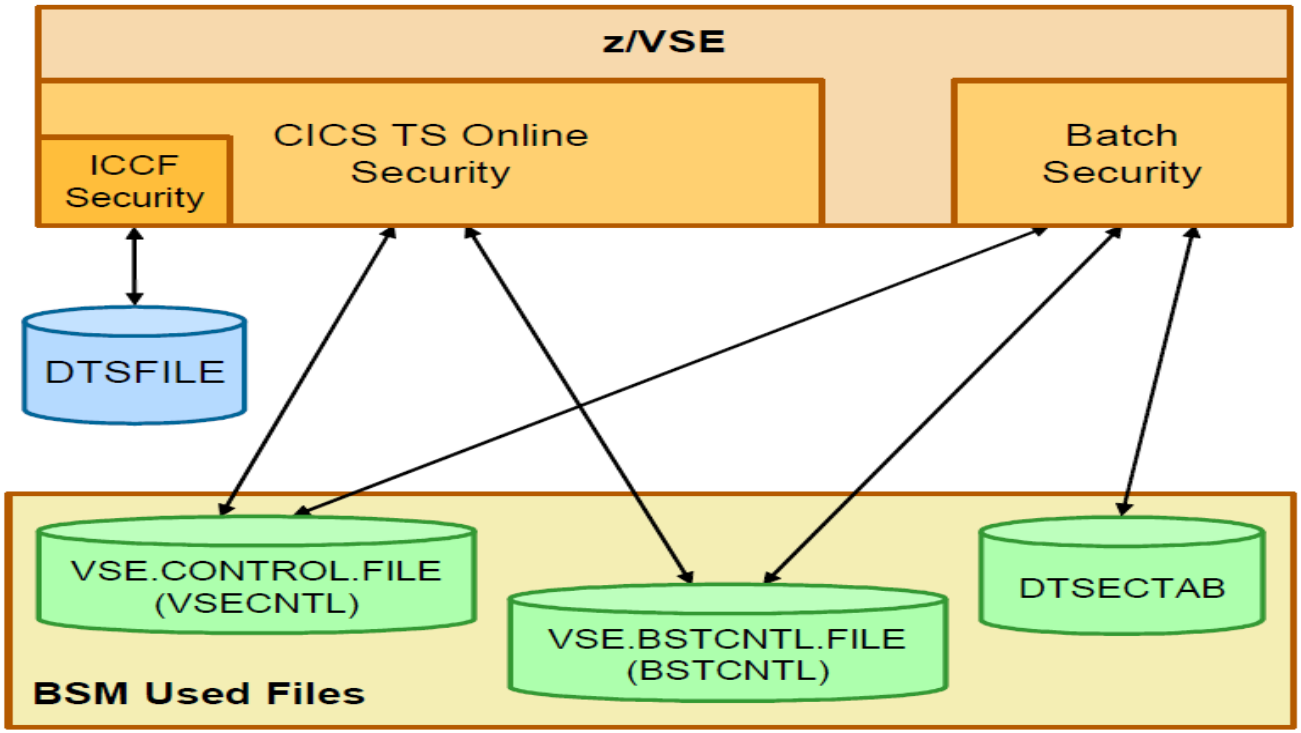
- Exploitation of IBM z14 / z14 ZR1
  - CPACF instructions as provided by z/Architecture
  - CryptoExpress cards
- Encryption at rest
  - Encryption Facility for z/VSE
  - Tape encryption (TS1120 – TS1140)
  - Disk encryption (DS8000)
- Encryption in flight, exploited by
  - openSSL
  - All EZA API users
  - EZA Multiplexer
  - Connector server
  - TCP/IP for z/VSE
  - IPv6/VSE
  - …

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
    - Need to be activated (via // SETPARM or on EZA API)
    - 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 (always active)
- SSL/TLS connection to secure remote VTAPE network transfer
- Operator interface for crypto device driver when BSM is not used

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

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 resource classes to generate the DTSECTAB (dialog 2-8-6)

- 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 a flag inside the rules
        (rules to be created with CICS2WS tool)
      - 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 Manager (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 Document Format (PDF) file

- IBM TCP/IP for z/VSE 2.2
  - Enhanced security with TLS 1.1 and TLS 1.2 support

More enhancements

- Allow JCL return code on cancel
  - New JCL standard option (STDOPT) and OPTION parameter to set return code
  - New SET parameter to specify last or maximum return code
- Parameter for LPAR name provides LPAR name of z/VSE system
- VOLUME and QT command
  - New parameters to limit the console output
    DISK, VDISK, ECKD, FBA (and SCSI), TAPE, VTAPE or USED / UNUSED
- Enhanced dataspaces: free MB frames, when releasing a dataspace
- Librarian program to read input from SYSLNK
- SDAID: print TRACE command at start of trace records (if OUTDEV set to printer)

IBM announcement: z/VSE 6.2 and DL/I 1.12.1 update

- z/VSE 6.2 update announced April 10, 2018
- DL/I VSE V1.12.1 introduces a partitioning function for hierarchical direct (HD) database
  - Available since June 22, 2018
- Backup of data using ICKDSF Flashcopy while the z/VSE PAV (Parallel Access Volume) support is active
  - Available as PTF at a later time
- Support / exploitation of z14 ZR1
  - Configurable Crypto Express6S
  - Elliptic Curve Cryptography (ECC) with a Crypto Express6S
  - Vector Facility for z/Architecture
  - High performance FICON for z Systems (zHPF)
  - FICON Express16S+
  - OSA-Express6S family

- Announcement letter: http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/6/897/ENUS218-086/index.html&request_locale=en
- DL/I 1.12.1 Release Guide: https://www.ibm.com/support/knowledgecenter/en/SSB27H_6.2.0/pdfs_6.2.0_neu.html

DL/I partitioning

- Available with DL/1 1.12.1 since June 22, 2018
- Partitioning only supported on z/VSE 6.2
- DL/I 1.12.0 and DL/I 1.12.1 are supported on z/VSE 6.2
  - DL/I 1.12.0 end of marketing with GA of DL/I 1.12.1
    Announcement letter: http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/8/897/ENUS918-068/index.html&lang=en&request_locale=en

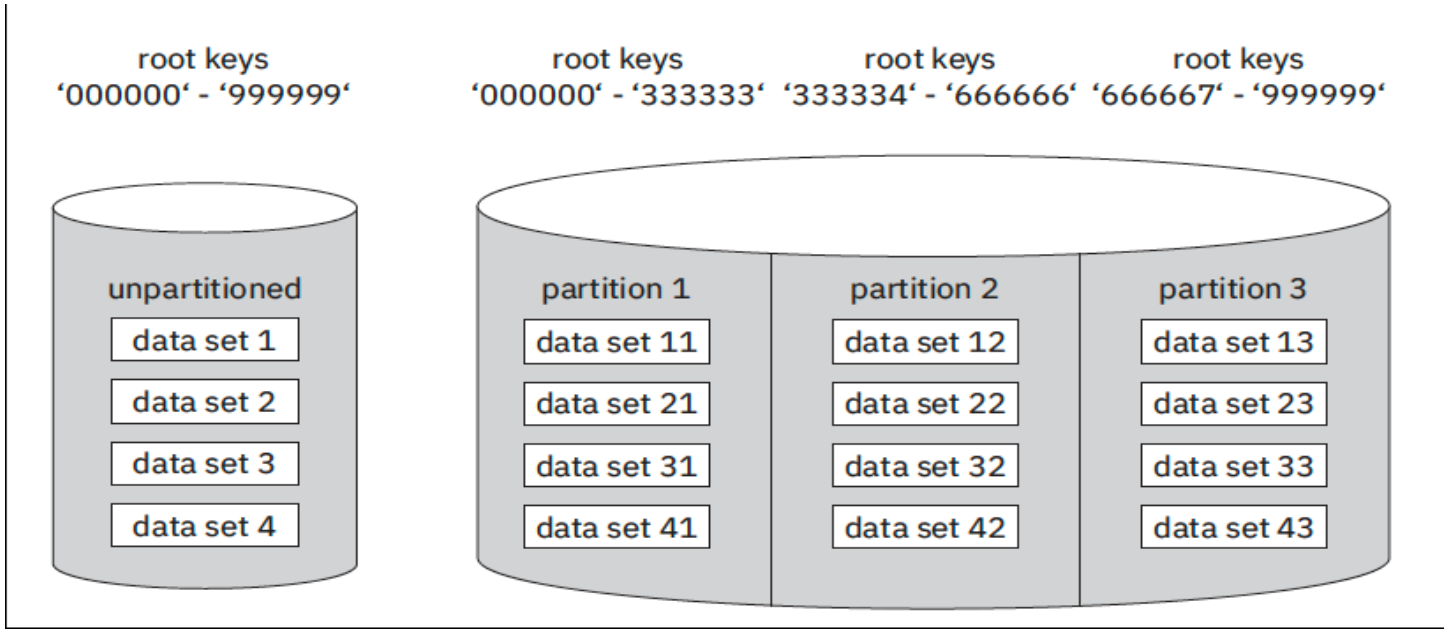
- For hierarchical direct (HD – HDAM / HIDAM) databases.
- Up to 128 partitions (sections) are supported (new NPARTS parameter in DBD macro)

- Allows users to increase the database storage capacity
  This eliminates the current limitation of 4 GB for DL/I segment types.
- Partitioning function splits a DL/I segment type into partitions (VSAM datasets)
- Exit provided, that selects the correct partition for the records to be retrieved.
- Each dataset can be up to about 4 GB in size.

- Transparent to user applications
- For sequential reading
  - a partitioned HDAM database, records may be returned in different order.
  - A partitioned HIDAM database, records are returned as before

DL/I partitioning …

- Example:



- Each partition owns the number of datasets
  as defined in the DBD (Database Descriptor) via DATASET statements.
- The database name (DD1) can be up to
  - 6 characters, if up to 16 partitions are defined
    suffix 1, 2, 3, …, G
  - 5 characters, if more than 16 partitions are defined
    suffix 11, 12, 13, … 1G for 1st 16 partitions
    suffix 21, 22, 23, … 2G for 2nd 16 partitions
    ...
    suffix 81, 82, 83, … 8G for the last 16 partitions of the 128 partitions

DL/I partitioning …

- Partition selection routine
  - provided by user, called by DL/I
  - calculates the partition number for root segment based on the passed key value of that root
  - partition selection control area (PSCA), which holds the following information:
    - Input:
      - name of partition selection module
      - database name
      - root key length-1
      - entry point of partition selection module
      - address of first byte of root key
      - number of partitions defined
    - Output:
      - calculated number of partition

- Sample partition selection routine provided (member DLZPSL10)

Migration to DL/I partitioning

To convert a database to partitioned format, a DL/I reorganization is necessary.

The required steps are:

1. DL/I Unload (DLZURGU0) of the existing database using old DMB / PSB phase.
2. Adapt database definition using new NPARTS parameters on DBD statement
   and, if needed, adjusted lengths of DD1 names on DATASET statements.
3. Run DBDgen of the changed DBD.
4. Run ACBgen on all affected PSBs
   with parameter DMB=YES to create new DMB / PSB phases.
5. Provide partition selection routine.
6. Delete / Define VSAM clusters for all required data sets.
7. DL/I Reload (DLZURGL0) using new DMB / PSB phase.
8. If secondary indexes or logical relationships exist,
   DL/I Prefix Resolution (DLZURG10) and DL/I Prefix Update (DLZURGP0) must be run.

PSB = Program Specification Block
DMB = Data Management Block
ACBgen = Application Control Block generation

DL/I Migration

- DL/I 1.12.1 can run on z/VSE 6.2 only, available June 22, 2018
- DL/I 1.12.0 is also supported on z/VSE 6.2.
  - End of marketing with DL/I 1.12.1 GA

- That is you have the following options
  - DL/I 1.12.0 can still be used on z/VSE 6.2, the upgrade may be later
  - Upgrade to DL/I 1.12.1 together with the z/VSE 6.2 upgrade

- DL/I 1.12.1 is upward compatible to DL/I 1.12.0
  - Easy upgrade to DL/I 1.12.1
  - No need to change DL/I online and batch applications
  - Online users need to re-assemble and recreate the DL/I nucleus
  - LIBDEF statements may need to be updated

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 system layout changed
  - More VSAM space required for PRD1 and PRD2 libraries

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
  - TCPIPSERVICE 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.

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

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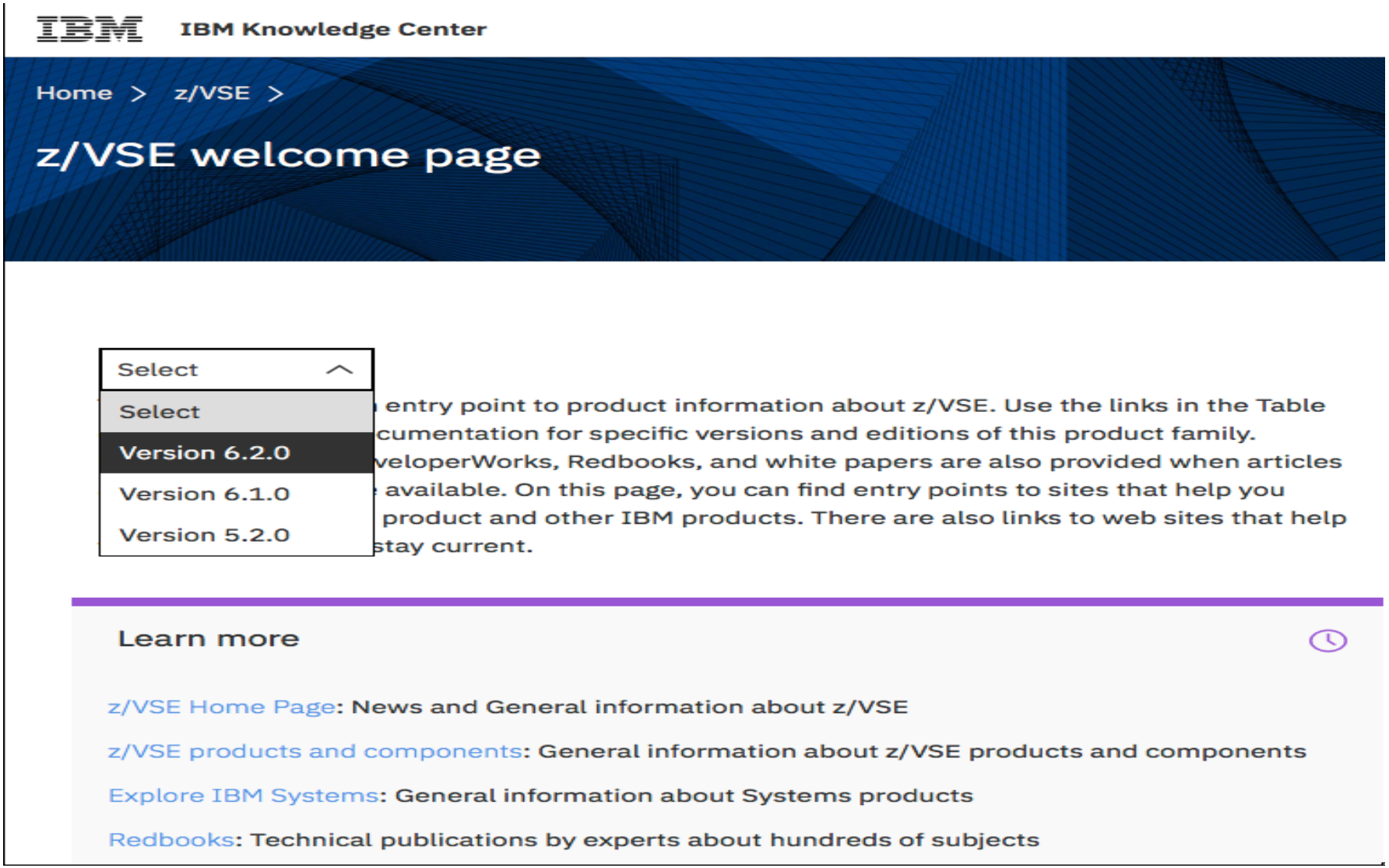

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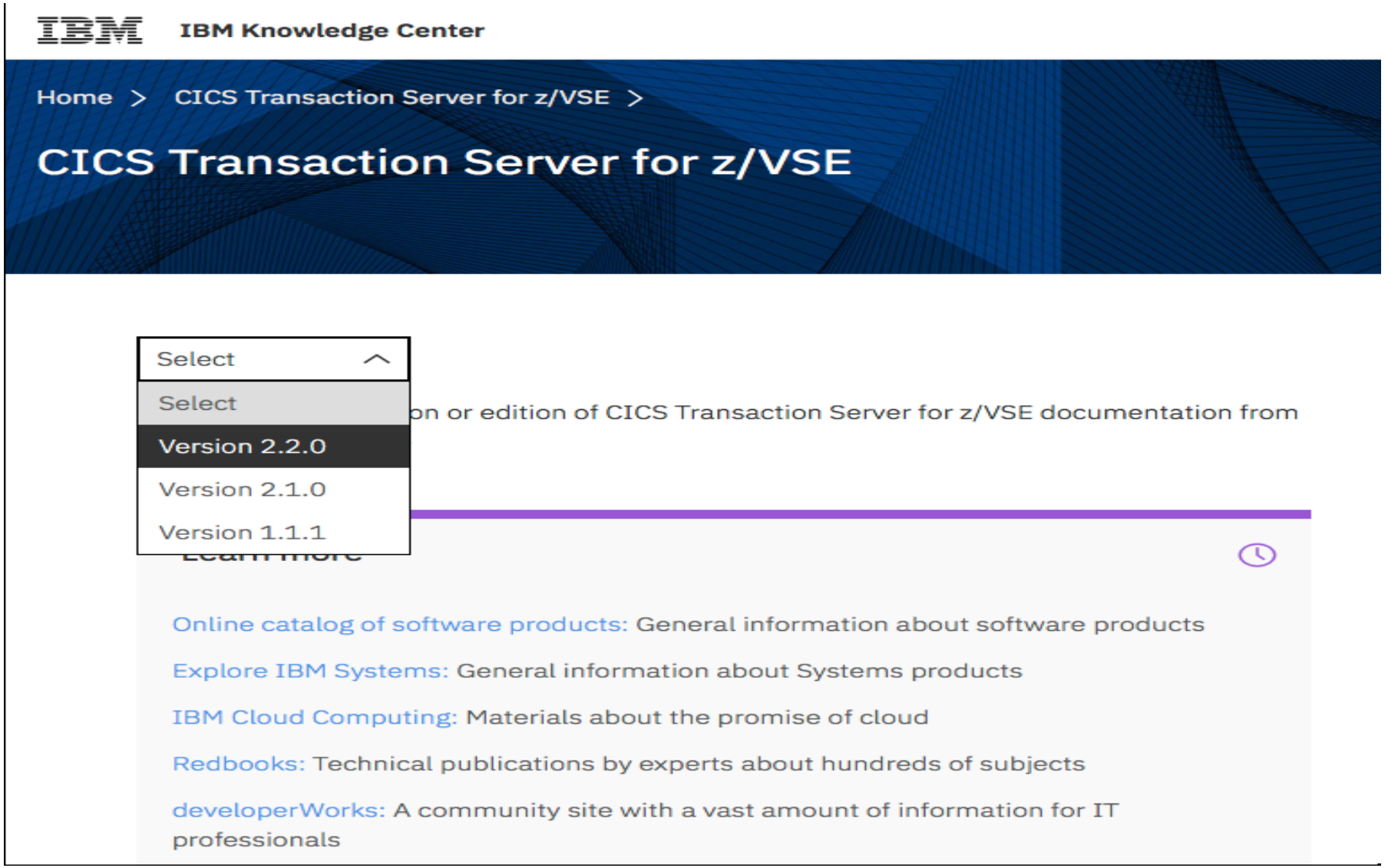

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z/VSE Requirements

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

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    - *Product family = z Systems Software*
    - *Product = z/VSE*
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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
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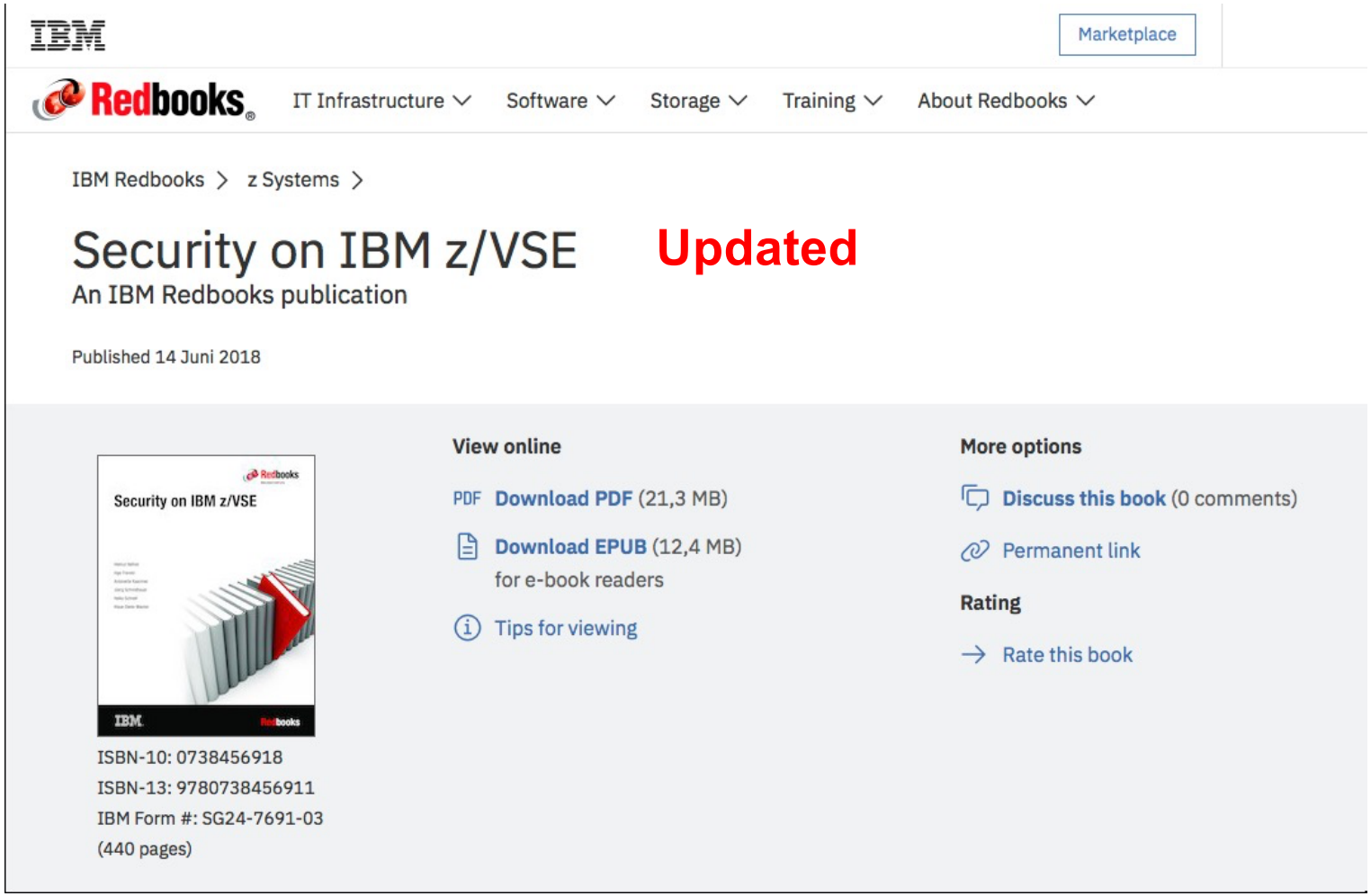

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  - Using SCRT (Java Version) with z/VSE – Best Practices
  - z/VSE release & hardware upgrade
  - z/VSE SCSI Support and Migration Options
  - z/VSE z/VM IP assist
  - Parallel Access Volume (PAV) white paper
  - ….
  - New: Hints and Tips for z/VSE 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

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