

Aktuelles rund um

Dagmar Kruse,
Systems Technical Sales, z/VSE
IBM Deutschland GmbH
dkruse@de.ibm.com

Agenda



- Kurz notiert
- IBM z Systems
- Virtualisierung & z/VM
- Linux on IBM z Systems
- z/VSE



Kurz notiert – IBM Festnetznummern

- Immer mehr IBM Niederlassungen haben keinen Festnetzanschluss mehr!
 - auch München (seit Sept. 2016)
 - meine alte Festnetznummer [089/4504-2229](tel:08945042229)
wird an das Call-Center weitergeleitet!
 - nutzen Sie die Festnetznummer, die seit März 2016
in meinen E-Mails angegeben sind:

Dagmar Kruse

IBM Deutschland
Hollerithstr. 1
81829 München
Phone: [+49-7034-274-5128](tel:+4970342745128)
E-Mail: dkruse@de.ibm.com

→ oder mein Firmenhandy: [0173-3063315](tel:01733063315)

Aktuelle IBM z Systems Server

IBM z13
(seit Jan. 2015)



IBM z13s
(seit Febr. 2016)



IBM LinuxONE Emperor

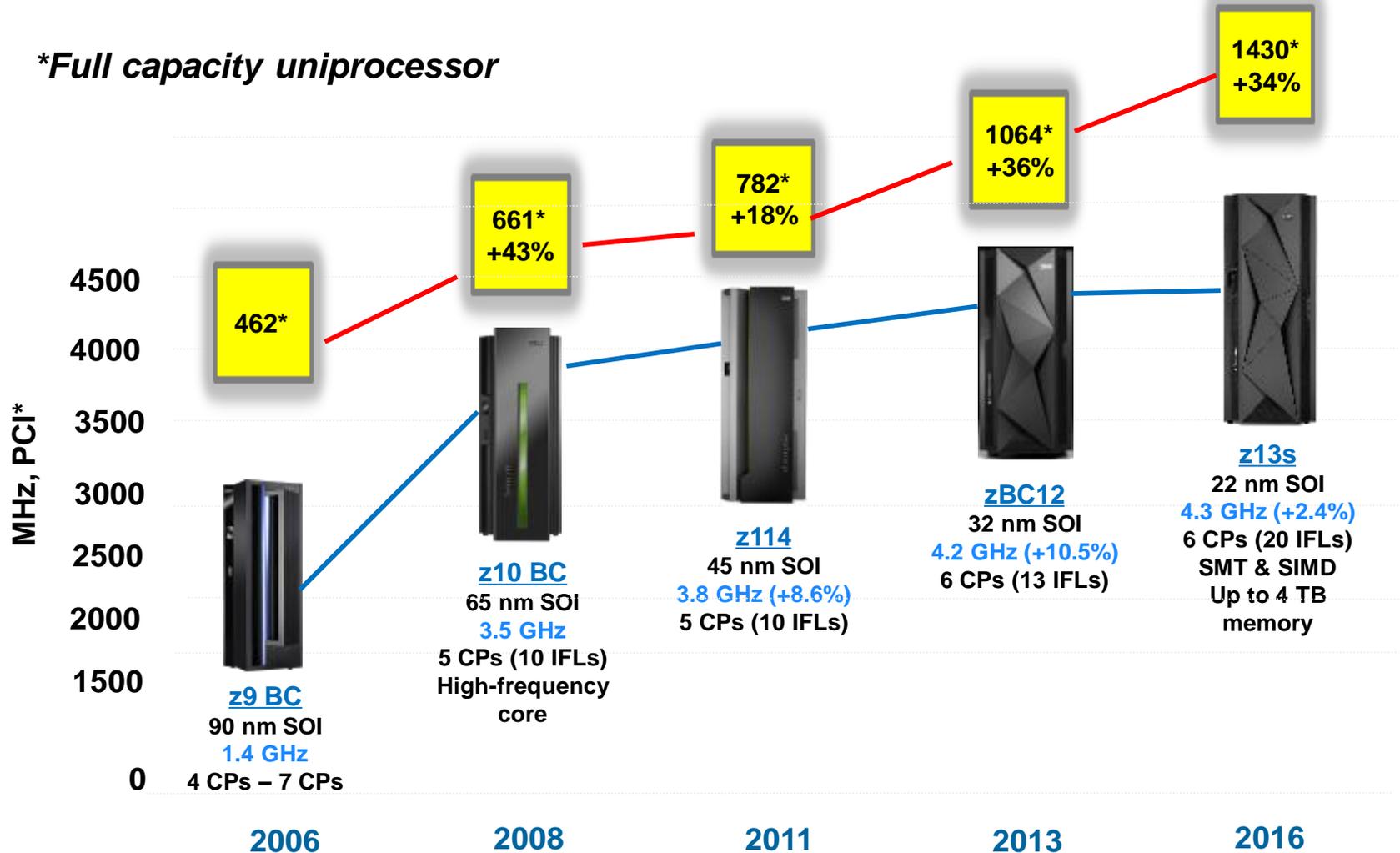


IBM LinuxONE Rockhopper



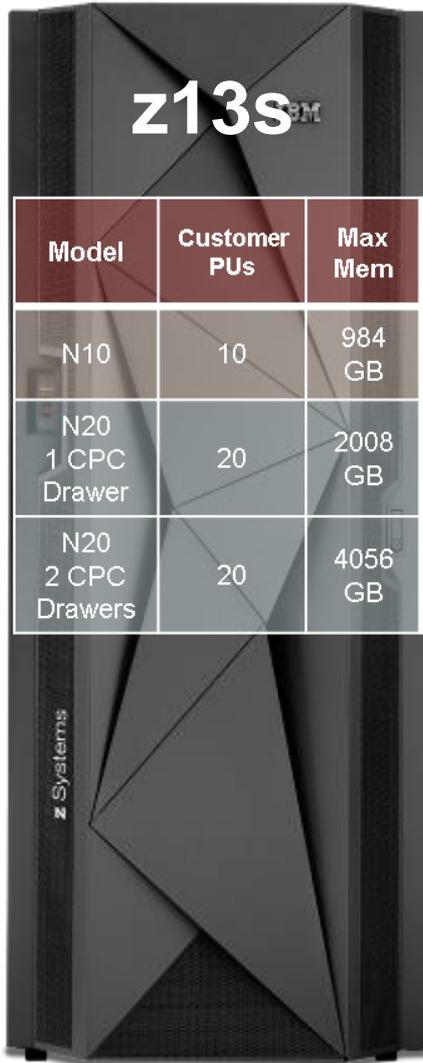
IBM z13s continues the CMOS Mainframe Heritage

**Full capacity uniprocessor*



*NOTE: MIPS Tables are NOT adequate for making comparisons of z Systems processors in proposals

z13s at a Glance



Model	Customer PUs	Max Mem
N10	10	984 GB
N20 1 CPC Drawer	20	2008 GB
N20 2 CPC Drawers	20	4056 GB

▪Machine Type

–2965

▪2 Models

–N10 and N20

- N20 available as one- or two- processor drawer model
- The 2nd drawer in the N20 is driven by I/O and/or memory requirements

–Single frame, air cooled

–Non-raised floor option available

–Overhead Cabling and DC Power Options

▪Processor Units (PUs)

–13 PU active cores (model N10 – 10 client configurable) or 26 PU active cores (model N20 – 20 client configurable)

–Up to 3 standard SAPs per system (2 for model N10, 3 for model N20)

–2 spares designated for Model N20

–1 Integrated firmware processor (IFP)

–Dependent on the H/W model - up to 10 (N10) or 20 (N20) PU cores available for characterization:

- Central Processors (CPs), Integrated Facility for Linux (IFLs), Internal Coupling Facility (ICFs), IBM z Integrated Information Processor (zIIP), optional - additional System Assist Processors (SAPs), Integrated firmware processor (IFP)

•156 capacity settings

▪Memory

–Up to 4 TB including:

- System minimum = 64 GB
- 40 GB fixed HSA separately managed
- RAIM standard
- Maximum for customer use 4056 GB (Model N20-2 drawer)
- Increments of 128 to 1024 GB
- Flash Express Read/Write Cache in HSA (0.5 GB)

▪I/O

–PCIe Gen3 channel subsystem

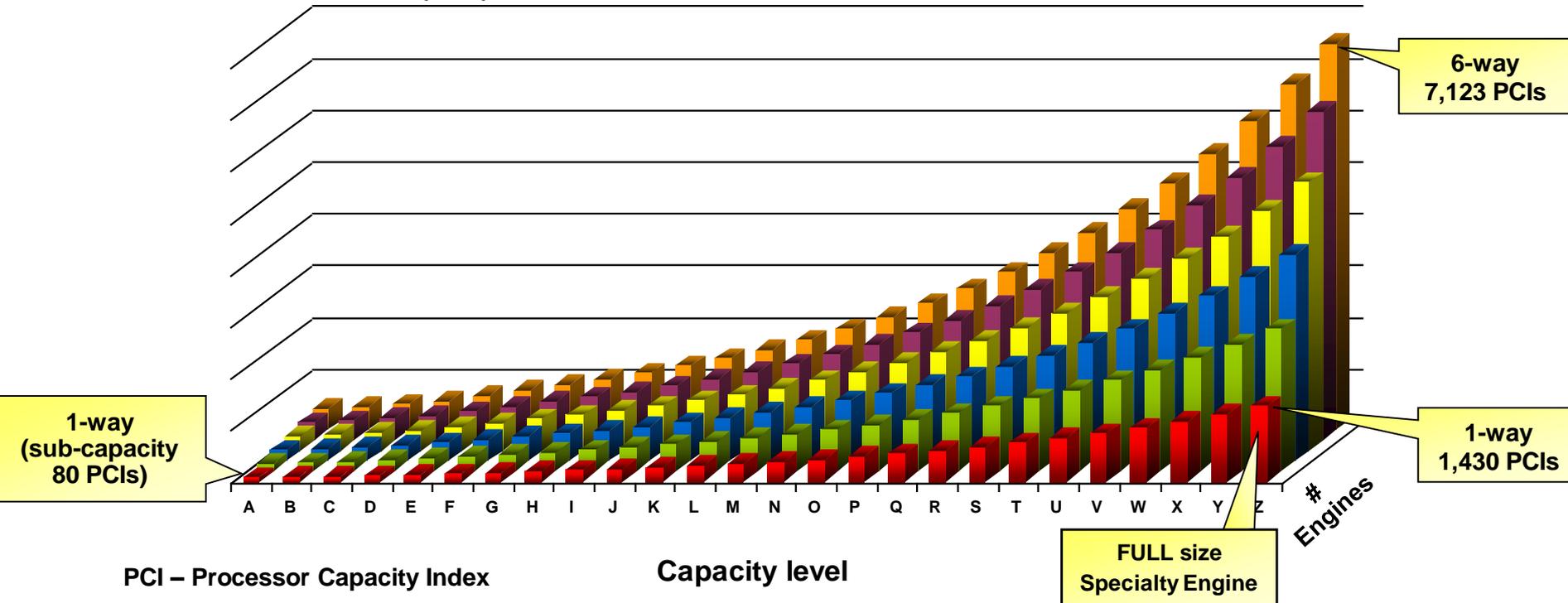
- Up to 64 PCIe Channel features
 - Support for non-PCIe Channel features (max one I/O drawer via carry forward)
- Up to 3 Logical Channel Subsystems (LCSSs)

▪STP - optional (No ETR)

IBM z13s Sub-capacity Processor Granularity

- The z13s has 26 CP capacity levels (26 x 6 = 156)
 - Up to 6 CPs at any capacity level
 - All CPs must be the same capacity level
- zAAPs are not available on z13s
- The ratio of zIIPs for each CP purchased is the same for CPs of any speed.
 - 2:1 zIIP to CP ratio – unchanged from zBC12
 - All specialty engines run at full speed
 - **Processor Value Unit (PVU) for IFL = 100**

Number of z13s CPs	Base Ratio	Ratio zBC12 to z13s
1 CP	zBC12 Z01	1.34
2 CPs	zBC12 Z02	1.38
3 CPs	zBC12 Z03	1.40
4 CPs	zBC12 Z04	1.42
5 CPs	zBC12 Z05	1.43
6 CPs	zBC12 Z06	1.44



Vergleich z13 / z13s Leistungsdaten

	CP (MIPS) Min	CP (MIPS) Max	MSUs Min	MSUs Max
z13	250	111.556	31	13.078
z13s	80	7.123	10	884
zBC12	50	4.958	6	614
z114	26	3.139	3	388
z10 BC	26	2.749	3	342
z9 BC	26	1.786	4	246



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IBM z Systems (LinuxONE) Virtualisierungsplattformen

IBM z Systems hat 3 strategische Plattformen zur Virtualisierung



IBM is committed to the KVM hypervisor and is responsible for the architecture and exploitation of the z Systems and LinuxONE hardware in the Linux upstream code

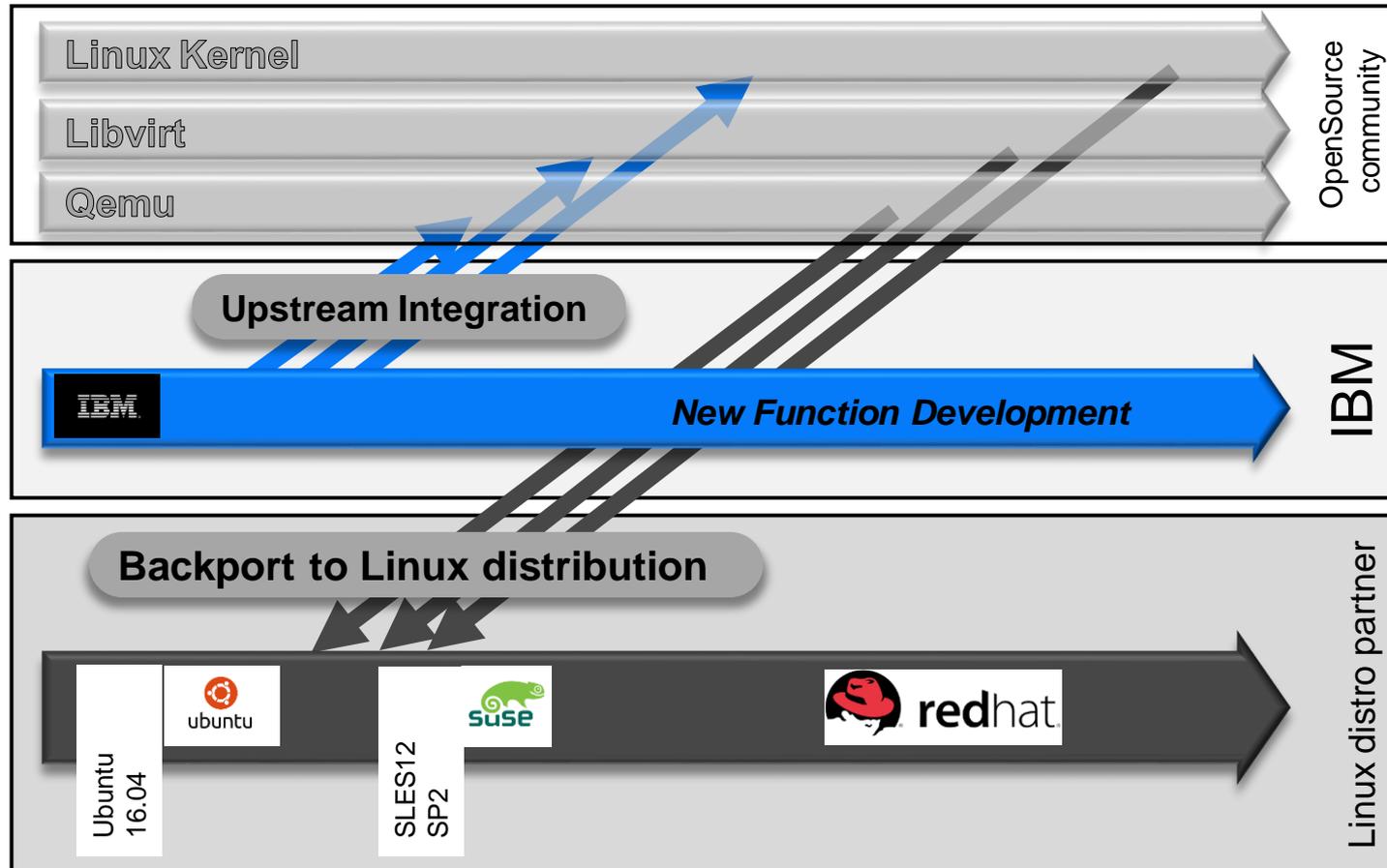
z/VM

Proprietary Server Virtualization that is completely integrated into the full stack. Complete hardware awareness. Supported on all IBM z Systems and LinuxONE servers. z/VM will continue to be enhanced to support Linux Workloads.

PR/SM & DPM

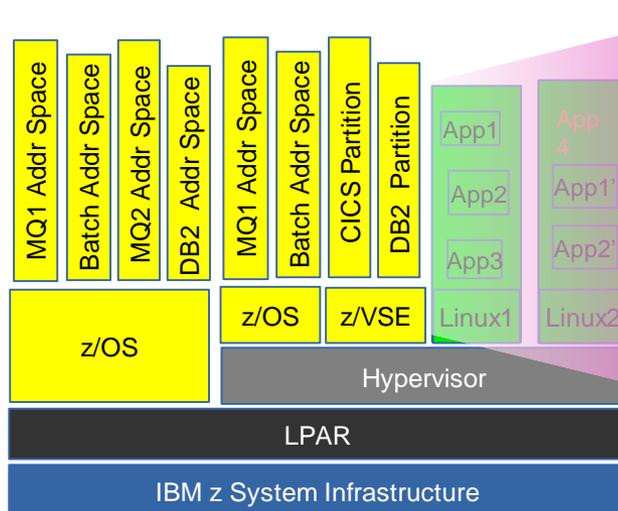
Divide one physical server into up to 85 logical partitions (LPAR) running a mix of multiple z/OS, z/VM, Linux, KVM for IBM z, Transaction Processing Facility (TPF) and z/VSE instances isolated and secured in parallel. Share resources across LPARs or dedicated to a particular LPAR. Running a mix of multiple z/OS, z/VM, Linux, TPF, KVM for IBM z and z/VSE instances isolated and secured in parallel.

KVM Upstream enablement for z Systems and LinuxONE



Anwendungen im z/OS, z/VSE und Linux on z Systems

z/OS, z/VSE & Linux virtualization

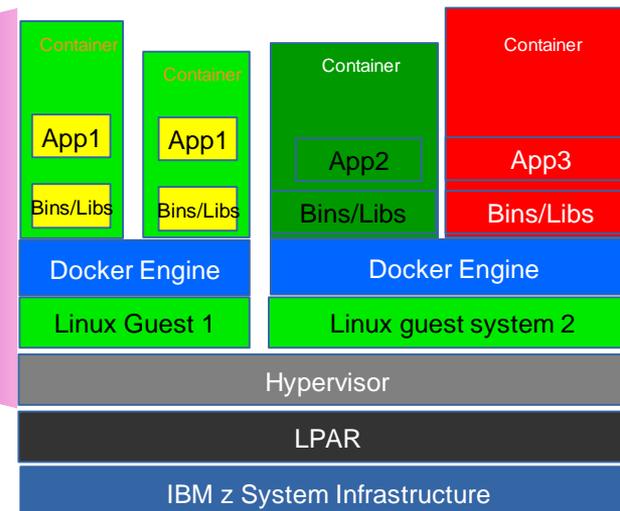


Virtualization:

- › Infrastructure oriented
- › Virtual server resource management
- › Several applications per server
- › Isolation per virtual server



docker Container deployment in Linux



Containers:

- › Service oriented
- › Application management via container
- › Solution decomposed into several units
- › Dynamic, isolation in container

„Container“ – nicht verwechseln!

Der Begriff **Container** wird vielfach im IT-Bereiche verwendet.

▪ Im Linux, Open Source,...: **Docker & Container**

- **Container:** isolierte „Paket“ für eine bestimmte Aufgabe
 - „Look and feel“ wie ein realer Server
- **Docker:** Open Source SW zur Container-Verwaltung
 - ein Docker-Container enthält eine Anwendung inklusive aller Dateien und Bibliotheken mit allen Abhängigkeiten
 - kein Virtualisierungs-Overhead
 - ist transportable



▪ Im CICS TS for z/VSE (z/OS): **Channel & Container (C&C)**

- **Container:** ein Block von Daten (ohne Längenbeschränkung)
 - wie COMMAREA (max. Länge von 32KB)
- **Channel:** eine Gruppe von Containern zur Übergabe an andere Programme



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z/VM Release - Überblick

z/VM Level	GA	End of Service	End of Marketing	Minimum Processor Level	Maximum Processor Level	Security Level
6.4	11/2016			IBM System z196 & z114 [®]	-	EAL 4+ OSPP-LS ^[1] FIPS 140-2 ^[1]
6.3	7/2013	12/2017 ^[2]	11/2016	IBM System z10 [®]	-	EAL 4+ OSPP-LS FIPS 140-2
6.2	12/2011	6/2017 ^[3]	7/2013	IBM System z10 [®]	z13	-
5.4	9/2008	12/2017 ^[4]	3/2012	IBM eServer zSeries 800& 900	zEC12	-

→ “Extended Support”- Verträge werden angeboten

Planen Sie rechtzeitig den Umstieg auf z/VM 6.4 → Migrationshilfen werden angeboten

^[1] Statements of Direction in the z/VM 6.4 announcement letter; Evaluation work in progress

^[2] Announced February 3, 2015

^[3] Announced February 2, 2016

^[4] Announced August 2, 2016

z/VM 6.4 – Überblick (1)



Designed for Clients of Today and Tomorrow

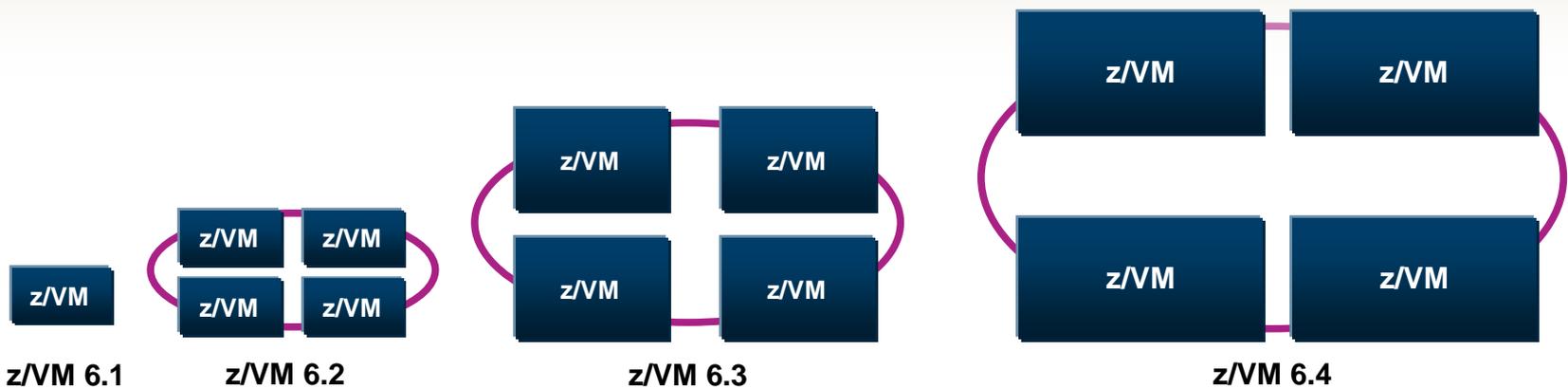
Oct 25, 2016
Announcement

Jan 20, 2017
Newton-Based
OpenStack Update

Feb 16, 2016
Preview
announcement

Nov 11, 2016
General availability

See <http://www.vm.ibm.com/zvm640/>



z/VM 6.4 – Überblick (2)



- Auslieferung: elektronisch oder per DVD - keine Tapes
- „Expanded Storage“ wird nicht mehr unterstützt
 - Nutzt nur noch Hauptspeicher (real memory) (z/VM 6.3 und 6.4)
- Funktionserweiterungen / Verbesserungen basieren auf Kunden-Feedback
 - Skalierbarkeit & TCO
 - HyperPAV Paging
 - 2 TB real memory support
 - Guest Large Page support
 - Guest Transaction Execution support
 - ...
 - Systemprogrammierung
 - CMS Pipelines
 - Upgrade in Place
 - CP Environment Variables
 - QUERY CP Service
 - SCSI Query enhancements
 - ...
- Installations-/ Migrationshinweise
 - Program Directories, <http://www.vm.ibm.com/progdir/>
 - Installation Guide, GC24-6246-03, <http://publibz.boulder.ibm.com/epubs/pdf/hcsc2c30.pdf>
- Bei Fragen zur Migration nach z/VM 6.4 können Sie sich gerne an Bill Bitner (bitnerb@us.ibm.com), z/VM Dev Lab Client Focus & Care, wenden.

z/VM 6.4 – Migrationshilfe “Upgrade in Place”



- **vermeidet eine Neuinstallation**

- bei der Migration von **z/VM 6.2- und z/VM 6.3-Systemen** nach z/VM 6.4
 - berücksichtigt Vendor- und Kundenanpassungen

- **Voraussetzung:**

- **entsprechender Service** muss auf dem alten z/VM Level installiert sein
 - vollständige Requirement-Liste finden Sie Installation Guide

- **Kundenerfahrung:**

- GSE-Vortrag: „G09 – Kundenvortrag: Erfahrungen mit dem Upgrade von z/VM 6.3 auf z/VM 6.4“
 - Migrationshinweise (ca. 100 Seiten) im Installation Guide sollte man genau lesen
 - „Upgrade in Place“ spart auf Dauer viel Zeit
 - mit Live Guest Relocation (LGR) im Single System Image (SSI) Cluster hat man nur minimalen Produktionsausfall bei Linux-Gästen

z/VM 6.4 – Migrationshilfe VMREVIEW



zeigt auf, was Sie bei der z/VM 6.4-Migration beachten sollten !

- bekommen Sie über die z/VM Download-Seite
<http://www.vm.ibm.com/perf/tips/vmreview.html>
- untersucht die zu migrierenden z/VM-Systemen z/VM 5.4, 6.1, 6.2 oder 6.3 und zeigt an
 - was vor der Migration noch geändert werden sollten
 - Werte, die in z/VM 6.4 ansteigen könnten
 - weitere interessante Punkte des Systems in Hinsicht auf z/VM 6.4
- diese Utility ist eine gute Hilfe, aber sicherlich noch nicht vollständig und lebt von Ihrem Feedback an Bill Bitner (bitnerb@us.ibm.com), z/VM Dev Lab Client Focus & Care

VMREVIEW Output (1)



```

C - GDLMV7 - [40 x 132]
File Edit View Communication Actions Window Help
*****
*                               VMREVIEW Verson 1.0                               *
*                               *                                                 *
*                               (c) Copyright International Business Machines Corporation *
*                               2016. All Rights Reserved.                         *
*                               *                                                 *
*                               This is a migration check of what could affect you by moving to 6.4.0 *
*****
This check performed on: 4 Jan 2017 at 15:08:07 by BITNER @ GDLMV7
System Level: 6.4.0
Output file will be: VMREVIEW LISTING A

For more information on the changes in 6.4.0 and resources to aid in
migration go to: http://www.vm.ibm.com/perf/tips/vmreview.html

No XSTORE found. This is going away in 6.4.0

Most of your virtual machines are not staying in the dispatch list.

Total:      0340
Dispatched: 0032
Percent:    0.09%

In 6.4.0 there are scheduler changes to include share settings of all
virtual machines.

It appears you have no active users on the Eligible list. The Eligible
list is going away in 6.4.0

It appears you have a lot of small volumes for paging:
-----
Press PF7 to scroll up and PF8 to scroll down.
Any other PFkey will exit

====>
15:11:39
Enter a command or press a PF or PA ke

```

VMREVIEW Output (2)



C - GDLMV7 - [40 x 132] File Edit View Communication Actions Window Help

It appears you have a lot of small volumes for paging:
2722, 2721, 2720, 271F, 271E, 271D, 271C, 271B, 271A, 2719, 2718,
2717, 2716, 2715, 2714, 2713, 2712, 2711, 2710, 270F, 270E, 270D,
270C, 270B, 270A, 2709, 2708, 2707, 2706, 2705, 2704, 2703, 2702,
2701, 2700, are all less than 18000

Lines 35 - 61 of 61
Columns 1 - 129 of 132

With HyperPAV support for paging which is added in 6.4.0 you will not need so many small paging volumes

It does not appear that you have SCSI EDEVS. In 6.4.0 there are new SCSI Management Queries.

It appears you are not currently using tapes. Just as a note:
In 6.4.0 tapes can no longer be used for installation and service.

Your machine is capable of multi-threading yet it appears to be disabled.
6.4.0 supports dynamic SMT. You should consider enabling it.

It appears you have at least one VSwitch. A new feature of 6.4.0 is the addition of a reset_counters function.

Your system currently has 40G of storage configured.
Please be aware that 6.4.0 increases the storage limit to 2TB.

Press PF7 to scroll up and PF8 to scroll down.
Any other PFkey will exit

====>

15:13:02

Enter a command or press a PF or PA key

MA C

39/008

z/VM 6.4 – Migrations-Checkliste



- Before you go to z/VM 6.4
 - Check service for z/VM Upgrade in Place if you plan to use it
 - Check for formation of eligible list
 - If planning to use additional memory, plan for additional dump and paging space
 - Acquire a z196, z114 or newer machine
 - Check for queues on paging devices
 - Download and run VMREVIEW utility
 - Collect Monwrite performance data
- When you bring up z/VM 6.4
 - Configure expanded storage as central storage
 - To prepare for Dynamic SMT, enable multithreading with 1 thread per core
 - Check Relocation Domain considerations
 - Collect Monwrite performance data
- To exploit capabilities with z/VM 6.4
 - Ensure guest configured to use large page as appropriate
 - If memory rich, consider using KEEPSLOT
 - Enable HyperPAV for paging if appropriate
 - Enable zHPF for paging
 - Investigate uses for environment variables
 - Collect Monwrite performance data

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IBM tested and supported Linux distributions

Distribution	LinuxONE Emperor		LinuxONE Rockhopper		
	z13	z13s	zEnterprise - zBC12 and zEC12	zEnterprise - z114 and z196	System z10 and System z9
RHEL 7	✓ (1)	✓ (1)	✓ (3)	✓ (3)	✗
RHEL 6	✓ (1)	✓ (1)	✓ (4)	✓	✓
RHEL 5	✓ (1)	✗ (10)	✓ (5)	✓	✓
RHEL 4 (*)	✗	✗	✗	✓ (8)	✓
SLES 12	✓ (2)	✓ (2)	✓	✓	✗
SLES 11	✓ (2)	✓ (2)	✓ (6)	✓	✓
SLES 10 (*)	✗	✗	✓ (7)	✓	✓
SLES 9 (*)	✗	✗	✗	✓ (9)	✓
Ubuntu 16.04	✓	✓	✓	✗	✗

See www.ibm.com/systems/z/os/linux/resources/testedplatforms.html for latest updates and details.

Linux on IBM z Systems Distributions (1/3)

■ SUSE:

– **SUSE Linux Enterprise Server 10**

- GA 17.7.2006; Kernel 2.6.16; GCC 4.1.0
- SLES 10 SP4: GA 12.4.2011; **EOS 31.7.2013; LTSS: 31.7.2016**

– **SUSE Linux Enterprise Server 11**

- GA 24.3.2009; Kernel 2.6.27 (SP4: 3.0); GCC 4.3.3 (SP4 4.3.4)
- SLES 11 SP4: GA 15.7.2015; EOS 31.3.2019; LTSS: 31.3.2022

– **SUSE Linux Enterprise Server 12**

- GA 27.10.2014; Kernel 3.12; GCC 4.8
- SLES 12 SP2: GA 8.11.2016; Kernel 4.4; GCC 4.8
- Last SP EOS 31.10.2024; LTSS: 31.10.2027

– <https://www.suse.com/support/policy.html>

– <https://www.suse.com/lifecycle/>

Linux on IBM z Systems Distributions (2/3)

- Red Hat:
 - **Red Hat Enterprise Linux AS 4**
 - GA 14.2.2005; Kernel 2.6.9; GCC 3.4
 - RHEL 4.9: GA 16.2.2011; **EOS 29.2.2012; ELS: 31.3.2017**
 - **Red Hat Enterprise Linux AS 5**
 - GA 15.3.2007; Kernel 2.6.18; GCC 4.1
 - RHEL 5.11: GA 16.9.2014; **EOS 31.3.2017; ELS: 30.11.2020**
 - **Red Hat Enterprise Linux AS 6**
 - GA 9.11.2010; Kernel 2.6.32; GCC 4.4
 - RHEL 6.9: GA 21.3.2017
 - Last Update EOS 30.11.2020; ELS: tbd
 - **Red Hat Enterprise Linux AS 7**
 - GA 9.6.2014; Kernel 3.10; GCC 4.8
 - RHEL 7.3: GA 3.11.2016
 - Last Update EOS 30.6.2024; ELS: tbd
- <https://access.redhat.com/support/policy/updates/errata/>
- <https://access.redhat.com/articles/3078>

Linux on IBM z Systems Distributions (3/3)

- Ubuntu:
 - **Ubuntu Server 16.04 LTS**
 - GA 21.4.2016; Kernel 4.4; GCC 5.3
 - Ubuntu Server 16.04.2 GA 16.2.2017
 - EOS 4.2021
 - **Ubuntu Server 16.10**
 - GA 13.10.2016; Kernel 4.8; GCC 6.1
 - EOS 7.2017
 - **Ubuntu Server 17.04**
 - GA 13.4.2017; Kernel 4.10; GCC 6.3
 - EOS 1.2018
 - Ubuntu Lifecycle:
 - <http://www.ubuntu.com/info/release-end-of-life>
 - https://wiki.ubuntu.com/Kernel/LTSEnablementStack?_ga=1.219828057.1549132454.1460845469
- Others:
 - Debian, Slackware
 - Support may be available by some third party

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z/VSE Roadmap



z/VSE 6.2: Prev. Ann.: 11.4.2017; GA: 4Q 2017
z/VSE Network Appliance, Migration Pricing Option
HW exploitation, CICS TS & CICS Explorer,
Easy of use, Networking and Security enhancements

z/VSE 6.1 GA: 27.11.2015
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 higher; z Systems exploitation

z/VSE 5.2 GA: 25.4.2014; end of marketing: 13.3.2017
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 higher
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 – Migration auf aktuelle z/VSE Release



- **z/VSE V5.2.0 mit CICS TS for VSE/ESA V1 und TCP/IP for VSE/ESA 15F:**
 - *End of Service ist **31.10.2018** (“Extended Support”- Vertrag danach möglich)*
 - Hardwareunterstützung: **IBM z9 + z10 EC/BC**, z196 / z114, zEC12 / zBC12, z13, z13s
 - **Fast Service Upgrade (FSU) von z/VSE 4.3.x und 5.1.x möglich**
 - Kundenkonfiguration bleibt erhalten
 - ausgelieferte System-Bänder haben Service-Level vom **05.03.2014**

- **z/VSE 6.1.0 mit CICS TS for z/VSE V2.0 und TCP/IP for z/VSE V2.0:**
 - Hardwareunterstützung: **IBM z10 EC/BC**, z196 / z114, zEC12 / zBC12, z13, z13s
 - **kein FSU, Neuinstallation erforderlich!**
 - ausgelieferte System-Bänder haben Service-Level vom **30.06.2016**

- **Aktueller empfohlener Service Level (RSL) hat alle PTFs bis 31.12.2016**
 - <http://www-03.ibm.com/systems/z/os/zvse/support/preventive.html#rsl>
 - sollte nach der Migration **unbedingt eingespielt** werden!
 - wird **ca. alle 6 Monate** erstellt

 - enthalten alle bekannten systemkritischen Hiper-PTFs
Preventive Service Planning buckets (PSP buckets)

z/VSE – Migration auf z/VSE V6.1 (1)



Neuinstallation ist eine **gute Chance das VSE-System aufzuräumen**

– **braucht aber Zeit.**

- weltweit wird z/VSE V6.1 gut angenommen, es gibt kaum Probleme
- in Deutschland sind relativ wenige z/VSE V6.1 Installationen bei Kunden
 - hier ist der Fast Service Upgrade (FSU) sehr beliebt
- **bisherige Migrationserfahrungen mit z/VSE V6.1**
 - reine Installation + Service Upgrade des ausgelieferten Systems → kein Problem
 - Anpassung an die eigenen Gegebenheiten → zeitaufwendig
 - es gab (kleine) Probleme mit TCP/IP (sowohl CSI als auch BSI)
 - daher möglichst viel und produktionsnah testen !
 - Updates der Vendorprodukte anfragen/beachten:
 - Versionswechsel bei
 - CICS TS for z/VSE V2.1
 - IBM TCP/IP for z/VSE V2.1

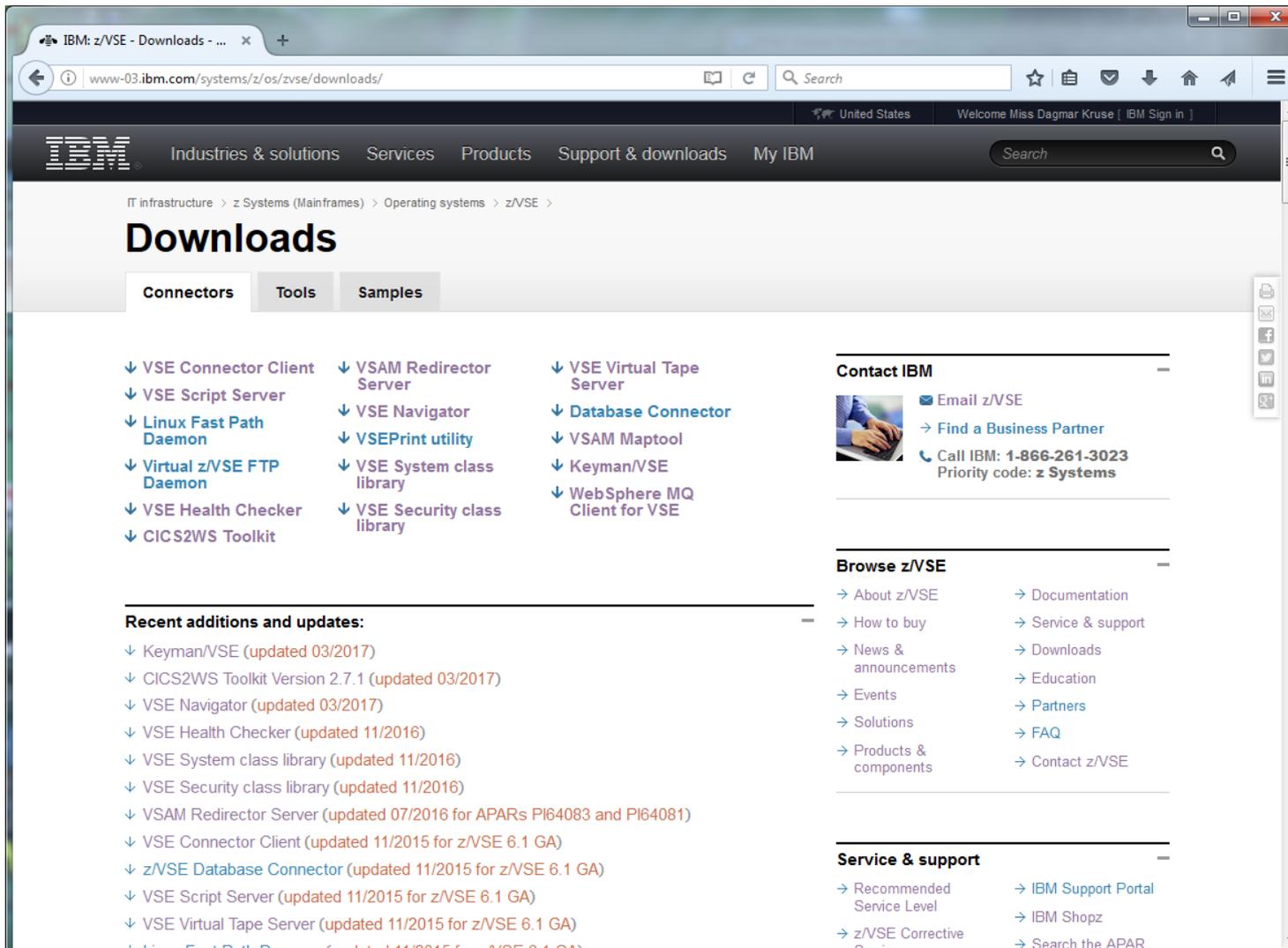
z/VSE – Migration auf z/VSE V6.1 (2)



Hilfestellungen (alles zu finden über z/VSE-Homepage)

- Systemliteratur, <http://www-03.ibm.com/systems/z/os/zvse/documentation/>
 - Programm Directory, Release Guide, Planning
 - Installation-Manual
- **Whitepaper: „z/VSE Release and Hardware Upgrade“**
<http://www-03.ibm.com/systems/z/os/zvse/documentation/documents.html#articles>
- Vorträge auf GSE-Tagungen
 - „Migrationshinweise zu z/VSE“, April 2016
 - „Erste Erfahrungen zu z/VSE V6.1“, April 2016
 - „z/VSE Hints & Tips“ der letzten beiden Tagungen in 2016
zu finden u.a. auf der z/VSE-Homepage unter
<http://www-03.ibm.com/systems/z/os/zvse/documentation/conferences.html>
- Live Virtual Classes <http://www-03.ibm.com/systems/z/os/zvse/education/#completed>
 - CSI TCP/IP for VSE Update (January 17, 2017)
 - Live Demo: Tape-less z/VSE installation (July 12, 2016)
 -
- ...

Aktuelles bei den z/VSE Konnektoren

The screenshot shows the IBM z/VSE Downloads page in a browser. The page title is "Downloads" and it is categorized under "Connectors". The main content area lists various download items, including VSE Connector Client, VSE Script Server, Linux Fast Path Daemon, Virtual z/VSE FTP Daemon, VSE Health Checker, CICS2WS Toolkit, VSAM Redirector Server, VSE Navigator, VSEPrint utility, VSE System class library, VSE Security class library, VSE Virtual Tape Server, Database Connector, VSAM Maptool, Keyman/VSE, and WebSphere MQ Client for VSE. A "Recent additions and updates" section lists updates for Keyman/VSE, CICS2WS Toolkit, VSE Navigator, VSE Health Checker, VSE System class library, VSE Security class library, VSAM Redirector Server, VSE Connector Client, z/VSE Database Connector, VSE Script Server, and VSE Virtual Tape Server. The page also features a "Contact IBM" section with links for Email z/VSE, Find a Business Partner, and Call IBM (1-866-261-3023), and a "Browse z/VSE" section with links for About z/VSE, Documentation, How to buy, Service & support, News & announcements, Downloads, Education, Events, Partners, Solutions, FAQ, Products & components, and Contact z/VSE. A "Service & support" section includes links for Recommended Service Level, IBM Support Portal, IBM Shopz, z/VSE Corrective, and Search the APAR.

IBM: z/VSE - Downloads - ... x +

www-03.ibm.com/systems/z/os/zvse/downloads/

United States Welcome Miss Dagmar Kruse [IBM Sign in]

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Downloads

Connectors Tools Samples

- ↓ VSE Connector Client
- ↓ VSE Script Server
- ↓ Linux Fast Path Daemon
- ↓ Virtual z/VSE FTP Daemon
- ↓ VSE Health Checker
- ↓ CICS2WS Toolkit
- ↓ VSAM Redirector Server
- ↓ VSE Navigator
- ↓ VSEPrint utility
- ↓ VSE System class library
- ↓ VSE Security class library
- ↓ VSE Virtual Tape Server
- ↓ Database Connector
- ↓ VSAM Maptool
- ↓ Keyman/VSE
- ↓ WebSphere MQ Client for VSE

Recent additions and updates:

- ↓ Keyman/VSE (updated 03/2017)
- ↓ CICS2WS Toolkit Version 2.7.1 (updated 03/2017)
- ↓ VSE Navigator (updated 03/2017)
- ↓ VSE Health Checker (updated 11/2016)
- ↓ VSE System class library (updated 11/2016)
- ↓ VSE Security class library (updated 11/2016)
- ↓ VSAM Redirector Server (updated 07/2016 for APARs PI64083 and PI64081)
- ↓ VSE Connector Client (updated 11/2015 for z/VSE 6.1 GA)
- ↓ z/VSE Database Connector (updated 11/2015 for z/VSE 6.1 GA)
- ↓ VSE Script Server (updated 11/2015 for z/VSE 6.1 GA)
- ↓ VSE Virtual Tape Server (updated 11/2015 for z/VSE 6.1 GA)

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Technical articles and whitepapers

- z/VSE Release and Hardware Upgrade (PDF, 665KB)
- Migrating from MQ Server on z/VSE to MQ Client using the z/VSE MQ Client Trigger Monitor (PDF, 150KB)
- Big Data and Hadoop with z/VSE (PDF, 500KB)
- Getting started with mobile development for z/VSE (PDF, 1.8MB)
- Mobile Integration of CICS Transaction Gateway and CICS Transaction Server for z/VSE (PDF, 460KB)
- z/VSE SCSI Support and Migration Options (PDF, 185KB)
- SHOWCB Enhancements in z/VSE V5.1 (PDF, 285KB)
- z/VSE z/VM IP Assist (PDF, 400KB)
- How to setup TN3270 with IPv6/VSE (PDF, 510KB)
- How to setup and use VSE Health Checker (PDF, 650KB)
- PAV Whitepaper (PDF, 195KB)

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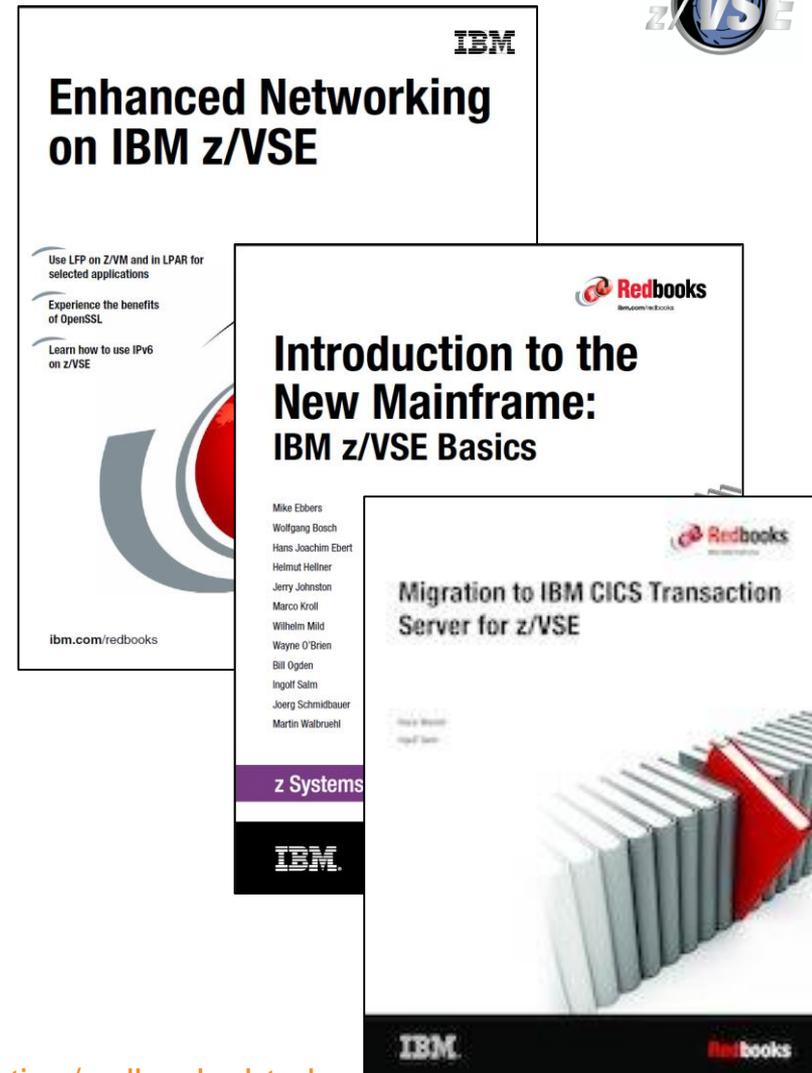
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<http://www-03.ibm.com/systems/z/os/zvse/documentation/documents.html>

Aktuelle z/VSE Redbooks

- **Enhanced Networking on IBM z/VSE**, SG24-8091 (Dez. 2014)
- **IBM z/VSE Basics**, SG24-7436
– Neuauflage Mai 2016
- **Migration to CICS Transaction Server for z/VSE V2.1**, SG24-8390 (Mai 2017)



<http://www-03.ibm.com/systems/z/os/zvse/documentation/redbooks.html>

z/VSE bietet viele neue Möglichkeiten - und nicht nur z/VSE



z/VSE Konnektoren

Nutzen Sie diese für Ihre Anforderungen!



Haben Sie Fragen?

**Vielen Dank
für Ihre Aufmerksamkeit!**

Dagmar Kruse,
Systems Technical Sales, z/VSE
IBM Deutschland GmbH
dkruse@de.ibm.com

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