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zSY0211

New Announcements for z/VSE V5 and its Follow-On Version

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Agenda



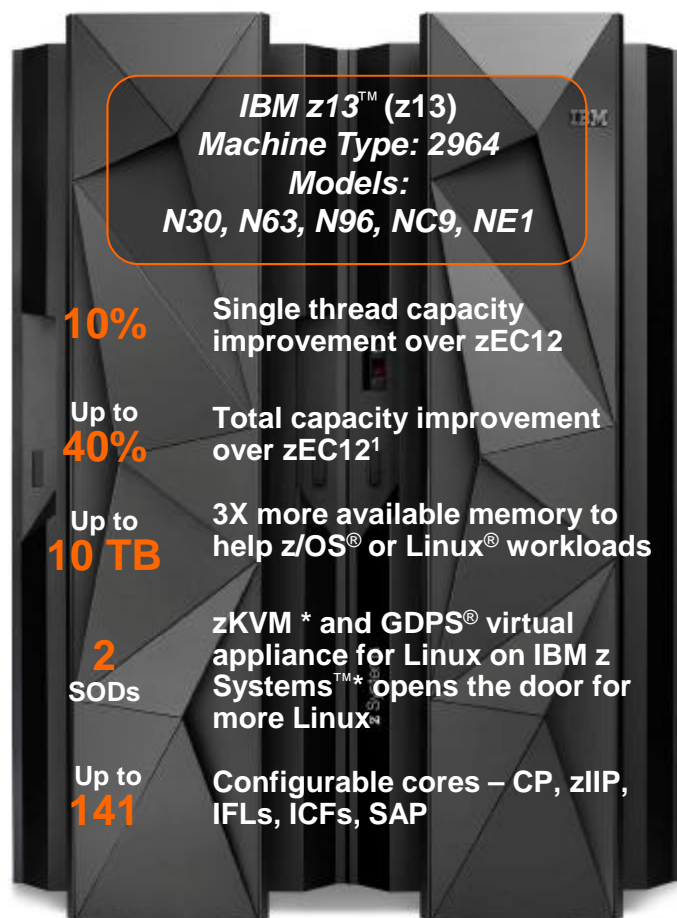
- • **IBM z13**
- **z/VSE – Today & Tomorrow**
- **Statements of Direction**
- **Software Pricing**
- **Summary**



The IBM z13



The mainframe optimized for the digital era



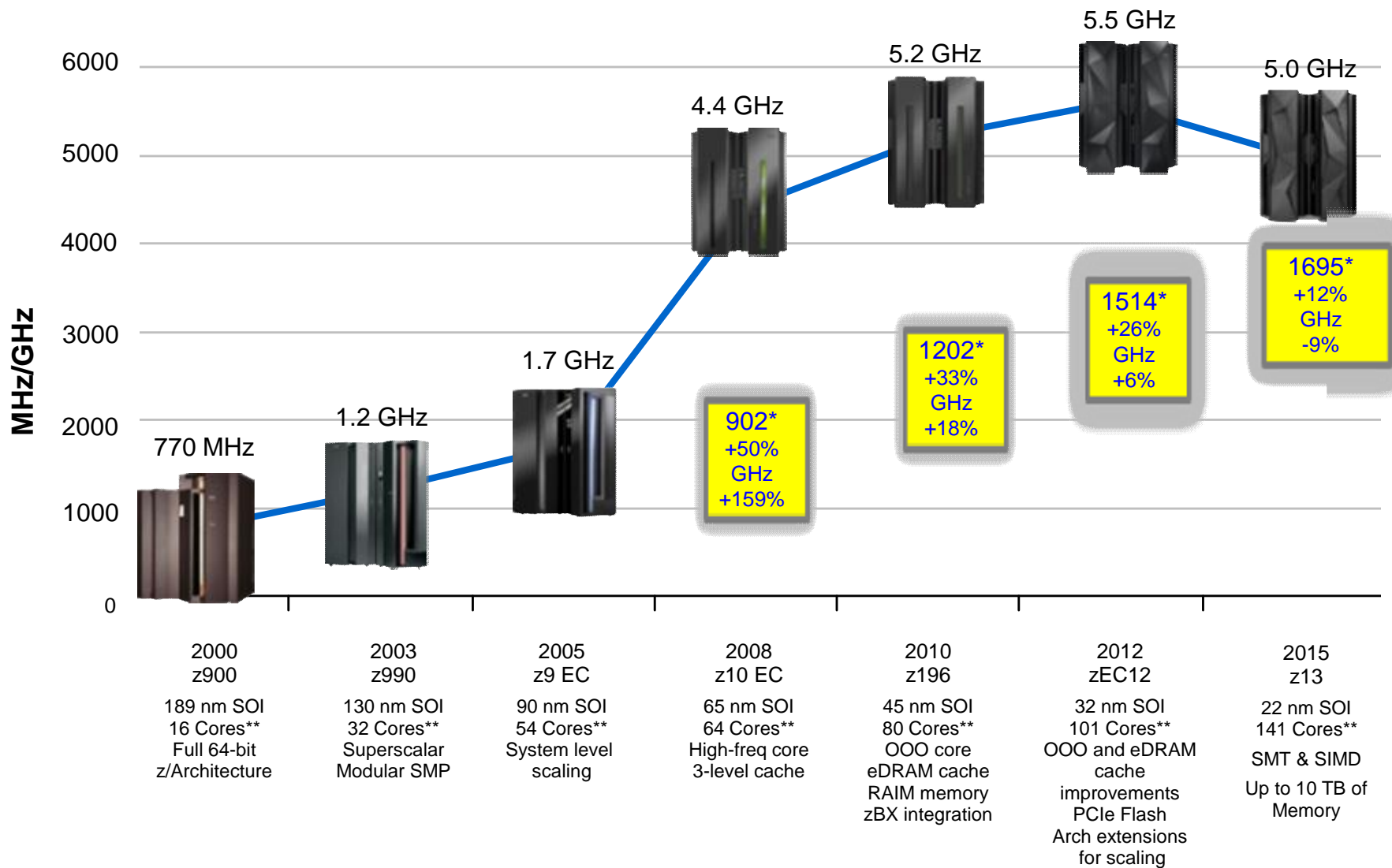
- Performance, scale, intelligent I/O and security enhancements to support transaction growth in the mobile world
- More memory, new cache design, improved I/O bandwidth and compression help to serve up more data for analytics
- Enterprise grade Linux solution, open standards, enhanced sharing and focus on business continuity to support cloud

Upgradeable from IBM zEnterprise® 196 (z196) and IBM zEnterprise EC12 (zEC12)

¹ Based on preliminary internal measurements and projections. Official performance data will be available upon announce and can be obtained online at LSPR (Large Systems Performance Reference) website at: <https://www-304.ibm.com/servers/resourceLink/lib03060.nsf/pages/lspindex?OpenDocument> . Actual performance results may vary by customer based on individual workload, configuration and software levels

* All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

z13 continues the CMOS mainframe heritage



* MIPS Tables are NOT adequate for making comparisons of z Systems processors. Additional capacity planning is required.

** Number of PU cores for customer use.

z/VSE hardware support status (as of May 2015)



<i>IBM z Systems</i>	z/VSE V6.1 (planned)	z/VSE V5.2	z/VSE V5.1	z/VSE V4.3 (EoS)	z/VSE V4.2 (EoS)
IBM z13	a	a	a	a	a
IBM zEnterprise EC12 & BC12	a	a	a	a	a
IBM zEnterprise 196 & 114	a	a	a	a	a
IBM System z10 EC & z10 BC	a	a	a	a	a
IBM System z9 EC & z9 BC	r	a	a	a	a
IBM eServer zSeries 990 & 890	r	r	r	a	a
IBM eServer zSeries 900 & 800	r	r	r	a	a



§ IBM z13 Toleration / Exploitation:

- Together with the **GA of z13** we delivered toleration **PTFs for z/VSE 5.1 and 5.2**
- **z/VSE**
 - can run in **more LPARs (85)**
 - supports **new Crypto Express5S** in coprocessor and accelerator mode
 - supports **more than 16 domains** with the new Crypto Express5S
 - supports **new FICON Express16S**
 - FICON-attached devices
 - FCP-attached SCSI disks
 - supports existing **OSA Express4S and 5S**
 - supports **newest version of SCRT**



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z/VSE continues to demonstrate IBM's commitment

Hardware Support
More Capacity
Quality
z/OS Affinity
Interoperability
Protect Integrate Extend



z/VSE V5.1 - 4Q2011
 ØzEnterprise exploitation
 ØIEDN connection to zBX
 Ø64-bit virtual memory objects
 ØALS to System z9
 Øz/VSE z/VM IP Assist (VIA)

+ SoD: CICS Explorer, LFP in LPAR

z/VSE V5.1.1 - 2Q2012
 ØCICS Explorer Monitoring
 ØUniversal database connector
 ØLinux Fast Path in LPAR

z/VSE V5.1.2 - 2Q2013
 Ø64-bit I/O for applications
 ØNetworking enhancements
 ØSecurity enhancements

+ SoD: CICS Explorer Update, DVD Install, IPv6/VSE price reduction

z/VSE V5.2 - 2Q2014
 ØAdditional zEnterprise exploitation
 ØDVD install
 ØNetworking and security enhancements

+ SoD: New version of z/VSE, ALS to System z10, support for channels & containers in CICS TS for z/VSE

Announced on April 7, 2014, jointly with Mainframe50 anniversary

z/VSE V6.1 - 4Q2015
 Øz13 exploitation
 ØALS to System z10
 ØCICS TS for z/VSE V2.1 incl CICS Explorer update, support for channels & containers
 ØTCP/IP for z/VSE V2.1
 ØIPv6/VSE V1.2

+ SoD: Secure z/VSE Software Delivery

Announced on May 11, 2015, 50 years after DOS/360

z/VSE Version 5 Release 2



Announced April 7, 2014, General Availability April 25, 2014

§ Hardware Exploitation

- Integration of PTFs delivered with z/VSE V5.1.2+
 - zBC12 exploitation (incl. support for Crypto Express4S, OSA-Express5S)
 - TS1140 tape drive (incl. encryption capabilities)
- Virtual disk in 64-bit virtual memory objects

§ Ease of Use

- Install from DVD for ECKD devices
 - Tape-less system for initial install

§ Networking

- IPv6 enhancements

§ Security

- Auditing enhancements
- OpenSSL integration

§ Customer Requirements

§ New z/VSE Statements of Direction



z/VSE Version 6 Release 1



Preview announced May 11, 2015, General Availability 4Q2015

§ **Exploitation of innovative IBM z13 technology**

- Configurable Crypto Express5S for data encryption and SSL acceleration
- FICON Express16S supporting a link rate of 16 Gbps

§ **New version of CICS TS for z/VSE V2.1**

- Update and control capabilities to CICS resources for the CICS Explorer system management tool
- New API to enable the transfer of large amounts of structured data between CICS applications to meet the needs of growing workloads

§ **TCP/IP for z/VSE V2.1** (new version): designed to include firewall functionality

§ **IPv6/VSE V1.2** (new release) will provide firewall functionality, increased network availability, and other enhancements

§ **Add trigger functionality for the WebSphere MQ Client** for z/VSE

§ Selected enhancements are also available with PTFs for z/VSE V5.x

§ z/VSE V6.1 requires an initial installation

- Fast Service Upgrade (FSU) from z/VSE V5.x is not supported





z/VSE V6.1 – Exploitation of IBM z13 technology



Preview announced May 11, 2015, General Availability 4Q2015

§ Configurable Crypto Express5S – new with z13

- Support for both, IBM Common Cryptographic Architecture (CCA) coprocessor and accelerator mode
 - PKCS#11 (EP11) coprocessor is not supported
- Can be used in both, LPAR and z/VM guest environment
 - z/VM PTF is required
- More than 16 domain support allows a Crypto Express5S adapter to be shared across more than 16 domains, up to the maximum number of LPARs on the system
 - Provides the flexibility of mapping individual LPARs to unique crypto domains or continuing to share crypto domains across LPARs
- The Crypto Express4S card cannot be used with a z13.



§ FICON Express16S – new with z13

- For FICON-attached devices as well as FCP-attached SCSI disks
- Supports a link data rate of 16 Gbps
- Autonegotiation to 4 or 8 Gbps for synergy with existing switches, directors, and storage devices
 - 2 Gbps control units cannot be attached

§ OSA Express4S and OSA Express5S

- Reuse of existing card from zEC12 and/or zBC12
 - Both cards can be configured with OSA/SF in HMC





z/VSE V6.1 – Exploitation of IBM System Storage



Preview announced May 11, 2015, General Availability 4Q2015

- **IBM System Storage TS7700 Virtualization Engine Release 3.2**

- Supports back-end physical tape attachments to a TS7720 with logical volume sizes up to 25 GB
- Copy Export function can be used for disaster recovery purposes
- Multi-Cluster Grid Support enables disaster recovery or high availability solutions



TS7700

- **FCP-attached SCSI disks can be used with:**

- IBM Storwize® V7000 Midrange Disk System
- IBM Storwize® V5000 Midrange Disk System
- IBM Storwize® V3700 Entry Disk System
- IBM XIV® Storage System
- IBM SAN Volume Controller
- IBM FlashSystem™ V840



FlashSystem 840

- **IBM System Storage DS8870 Release 7.4**

- Newest member of the IBM System Storage DS8000 series
- Supports FICON-attached ECKD and FCP-attached SCSI disks



Storwize V7000



z/VSE V6.1 – CICS TS for z/VSE V2.1



Preview announced May 11, 2015, General Availability 4Q2015

§ **New CICS TS version for z/VSE**

§ The first major CICS TS update since 1999

§ **Only available for z/VSE V6.1 and later, replaces CICS TS for VSE/ESA V1.1.1**

§ CICS TS for VSE/ESA V1.1.1 still delivered with z/VSE V5.2

§ **New CICS TS build includes:**

§ CICS Explorer update & control capability

- Update resources as you would do with transactions on your CICS terminal
- Enable / disable CICS resources
- Change selected CICS definitions

§ Channel & Container support

§ New API, ported from CICS TS for z/OS V3.1

§ Allows users to transfer any amount of data up to the size of the CICS partition

§ Lifts the 32k COMMAREA limitation

§ Language support for C, COBOL, HLASM and PL/I

§ CICS requirements

§ More current cypher suites (AES128/256) to CICS Web Support

§ Support for EXEC CICS INQUIRE SYSTEM OSLEVEL

§ Millisecond support in EXEC CICS ASKTIME and EXEC CICS FORMATTIME





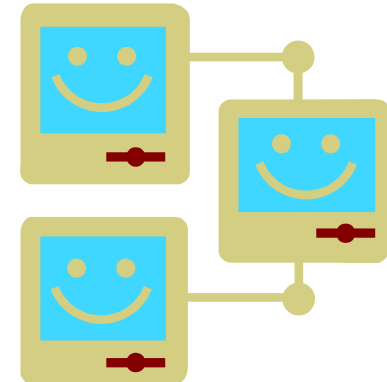
z/VSE V6.1 – Networking enhancements



Preview announced May 11, 2015, General Availability 4Q2015

§ TCP/IP for z/VSE V2.1

- § A new version of CSI's TCP/IP stack
- § Levelset based on TCP/IP for VSE/ESA 1.5F
- § New white-list firewall feature
- § Internal processing improvements
 - Cross memory services for external partition socket requests
 - New utilities for automation and TN3270 services
 - Enhanced TLS/SSL cryptography



§ IPv6/VSE V1.2

- § A new release of BSI's TCP/IP stack
- § Basic firewall support
- § Automated OSA Express failover using hot swap devices for high availability
- § Improved stack CPU optimization
- § Improved SSL support including TLS 1.2 and DH/ECC sockets
- § Virtual IP address support using virtual network devices

WebSphere MQ Server for z/VSE – Withdrawn



§ End of Marketing Announcement

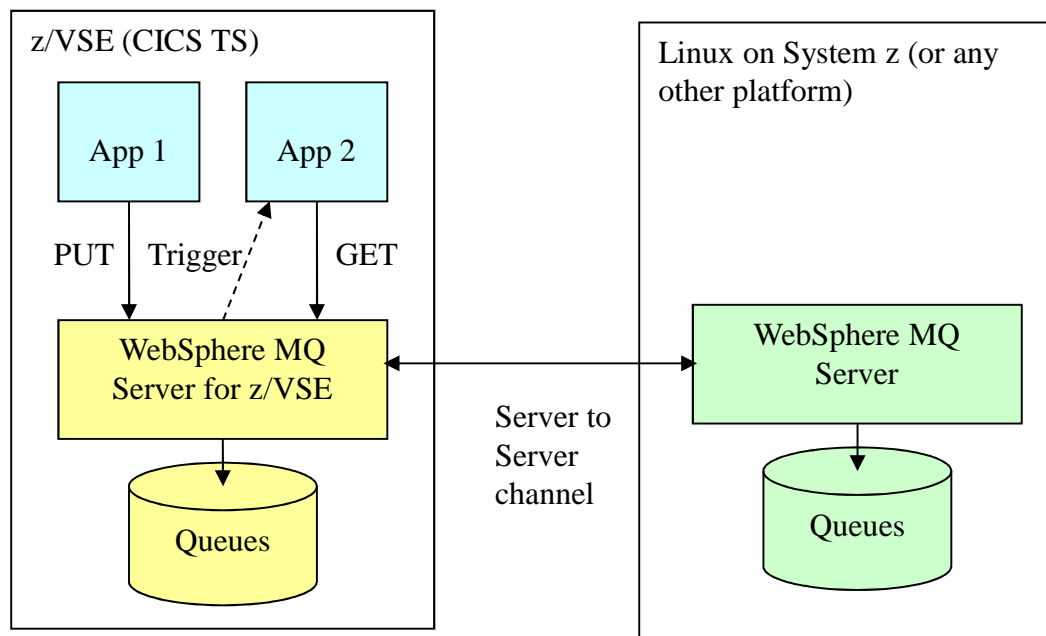
- IBM WebSphere MQ for z/VSE 3.0 (5655-U97) announced EoM on June 3, 2014
- EoM effective since Sep 8, 2014

§ End of Service Announcement

- WebSphere MQ for z/VSE 3.0 announced EoS on Aug 5, 2014
- EoS planned to become effective by Sep 30, 2015
- Individual service extension contracts can be requested for service beyond Sep 30, 2015 for a period of at least 3 years.

§ WebSphere MQ Client for z/VSE continues to be available

- No EoM / EoS planned for the WebSphere MQ client for z/VSE



§ EoM: <http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&appname=iSource&supplier=897&letternum=ENUS914-104>

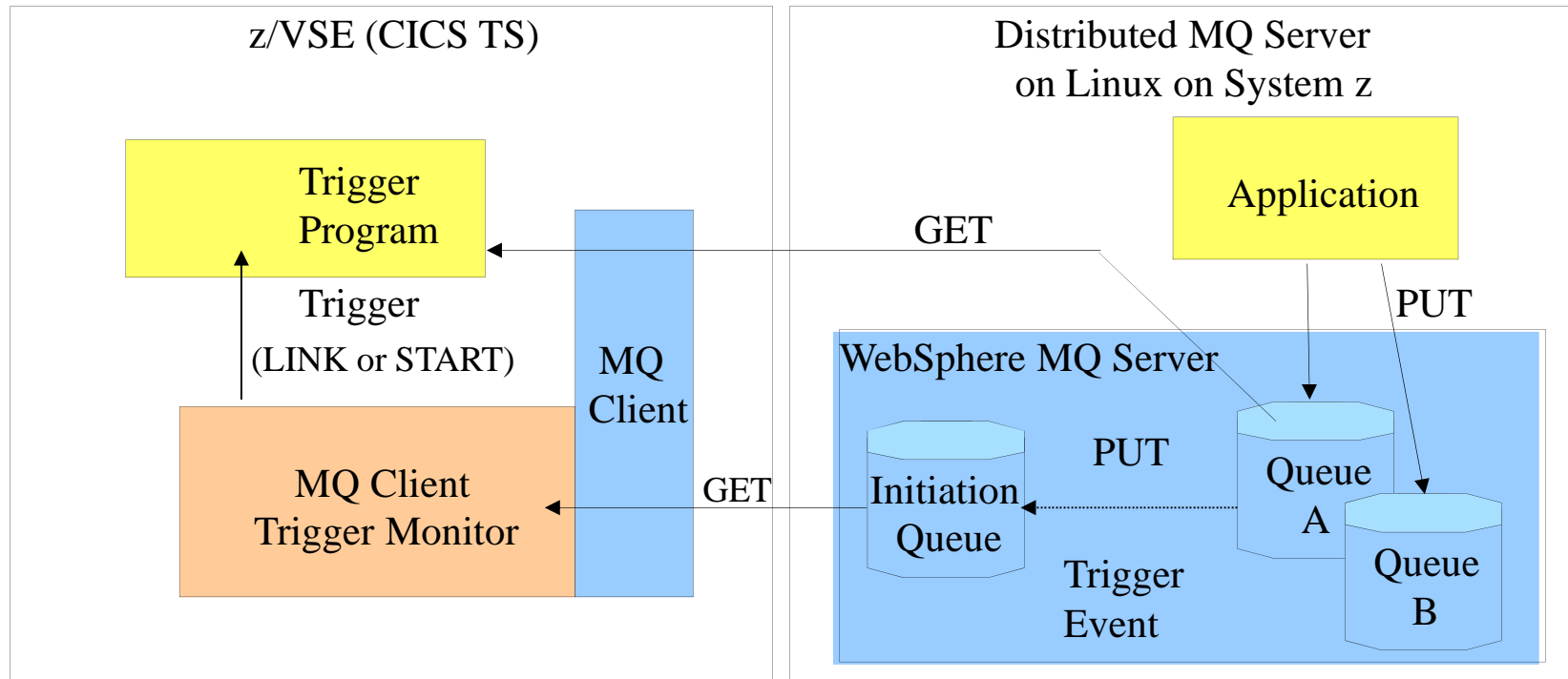
§ EoS: <http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&appname=iSource&supplier=897&letternum=ENUS914-150>



z/VSE V6.1 – Trigger monitor for WebSphere MQ client

Preview announced May 11, 2015, General Availability 4Q2015

- Trigger z/VSE CICS TS programs with z/VSE MQ client
- Similar to how an MQ server on z/VSE would trigger a program



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ALS to IBM System z10



z/VSE V5.2 will be the last release that supports IBM System z9. Future releases of z/VSE will support IBM System z10 and higher.

- SOD launched in 4/2014
- Fulfilled with z/VSE V6.1 in 4Q2015
- Remember:
 - z/VM V6 requires System z10 and higher
 - SLES 12 and RHEL 7 require zEnterprise 196 and higher

<i>IBM z Systems</i>	z/VSE V6.1	z/VSE V5.2	z/VSE V5.1	z/VSE V4.3 (EoS)
IBM z13	a	a	a	a
IBM zEnterprise EC12 & BC12	a	a	a	a
IBM zEnterprise 196 & 114	a	a	a	a
IBM System z10 EC & z10 BC	a	a	a	a
IBM System z9 EC & z9 BC	r	a	a	a
IBM eServer zSeries 990 & 890	r	r	r	a
IBM eServer zSeries 900 & 800	r	r	r	a

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z/VSE Central Function becomes z/VSE



IBM intends to rename the product z/VSE Central Functions to z/VSE in a new z/VSE version.

- SOD launched in 4/2014
- Fulfilled with z/VSE V6.1 in 4Q2015
- Today:
 - z/VSE CF V7 is contained in z/VSE V3
 - z/VSE CF V8 is contained in z/VSE V4
 - z/VSE CF V9 is contained in z/VSE V5
- Future:
 - z/VSE CF Vx is eliminated and renamed into z/VSE V6



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CICS DDM stabilization



Support for CICS Distributed Data Management (DDM) is stabilized in CICS TS for VSE/ESA V1.1.1. In a future release of CICS TS for z/VSE, IBM intends to discontinue support for CICS DDM.

- SOD launched in 4/2014
- Fulfilled with z/VSE V6.1 in 4Q2015

- Most likely no effect on z/VSE customers because no known user of DDM

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Secure z/VSE software delivery



IBM plans to remove support for unsecured FTP connections used for z/VSE software and service delivery. It is planned that new z/VSE software (products and service) downloads will require the use of HTTPS (Hypertext Transfer Protocol Secure, supporting the TLS and SSL cryptographic protocols) or Download Director with encryption.

- SOD launched in 5/2015



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Product delivery of z/VM on DVD / Electronic only

Product Delivery of z/VM on DVD/Electronic only: z/VM V6.3 will be the last release of z/VM that will be available on tape. Subsequent releases will be available on DVD or electronically.

- SOD launched in 1/2015
- No more tapes for z/VM product delivery for future z/VM releases
- Allows testing resources to be spent else where
- Watch out for z/VSE announcements

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GDPS / PPRC Multiplatform resiliency capability



In the first half of 2015, IBM intends to deliver a GDPS/Peer to Peer Remote Copy (GDPS/PPRC) multiplatform resiliency capability for customers who do not run the z/OS operating system in their environment. This solution is intended to provide IBM z Systems customers who run z/VM and their associated guests, for instance, Linux on z Systems, with similar high availability and disaster recovery benefits to those who run on z/OS. This solution will be applicable for any IBM z Systems announced after and including the zBC12 and zEC12.

- SOD launched in 1/2015
- Lower the skill expense of running a GDPS environment, particularly for those customers with little, or no, z/OS background
- Might be applicable for VM/VSE customers, too

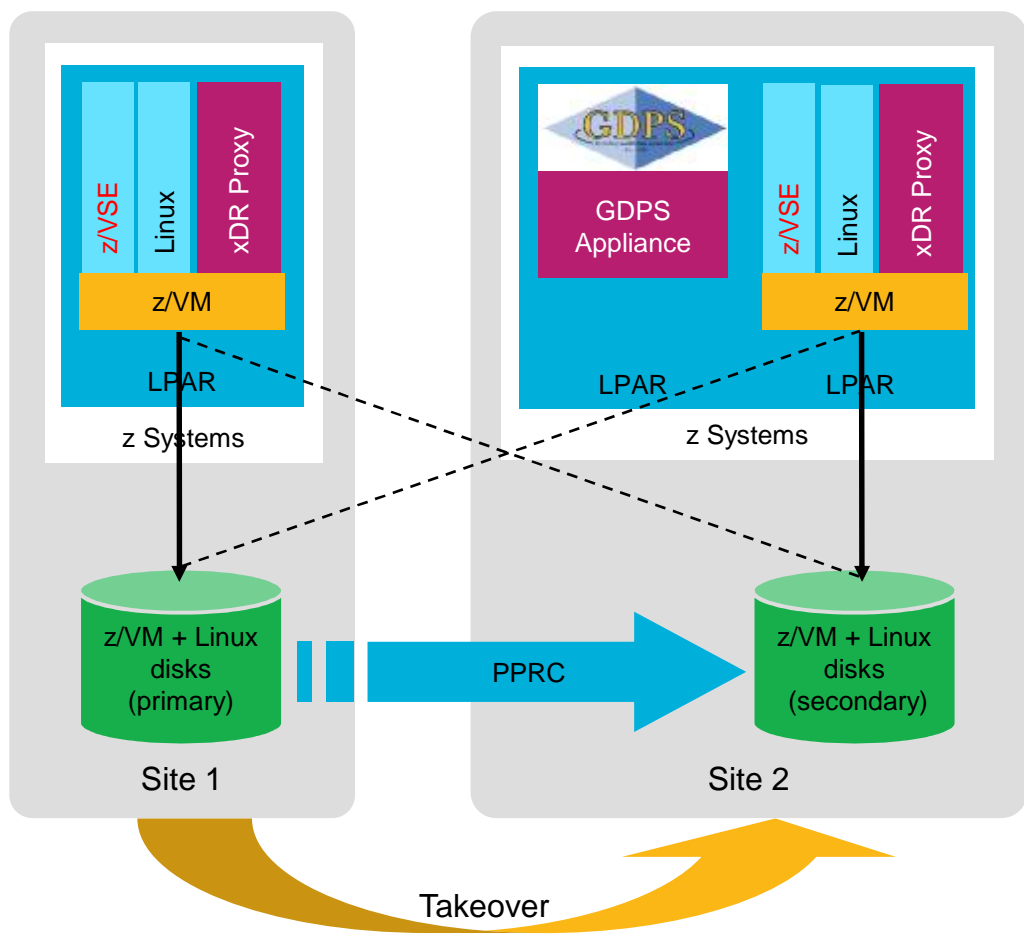
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Disaster recovery for Linux on z Systems and z/VSE

GDPS Virtual Appliance extends GDPS capabilities into z/VM and Linux on z Systems environments that do not have z/OS

- Single point of control and automation reduces the need for highly specialized skills to handle recovery and planned site switches
- Manages remote copy environment and keeps data available and consistent for operating systems and applications.
- HyperSwap® function protects against failures to disk subsystems.
- Monitoring and automation to ensure reliable and rapid recovery via automated processes
- GDPS Virtual Appliance requires:
 - General purpose engine
 - z/VM and Linux on z Systems
 - ECKD Disk



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KVM offering for IBM z Systems



In addition to the continued investment in z/VM, IBM intends to support a Kernel-based Virtual Machine (KVM) offering for z Systems that will host Linux on z Systems guest virtual machines.

The KVM offering will be software that can be installed on z Systems processors like an operating system and can co-exist with z/VM virtualization environments, z/OS, Linux on z Systems, z/VSE, and z/TPF.

The KVM offering will be optimized for z Systems architecture and will provide standard Linux and KVM interfaces for operational control of the environment, as well as providing the required technical enablement for OpenStack for virtualization management, allowing enterprises to easily integrate Linux servers into their existing infrastructure and cloud offerings.

- SOD launched in 1/2015

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KVM offering for IBM z Systems



What and why?

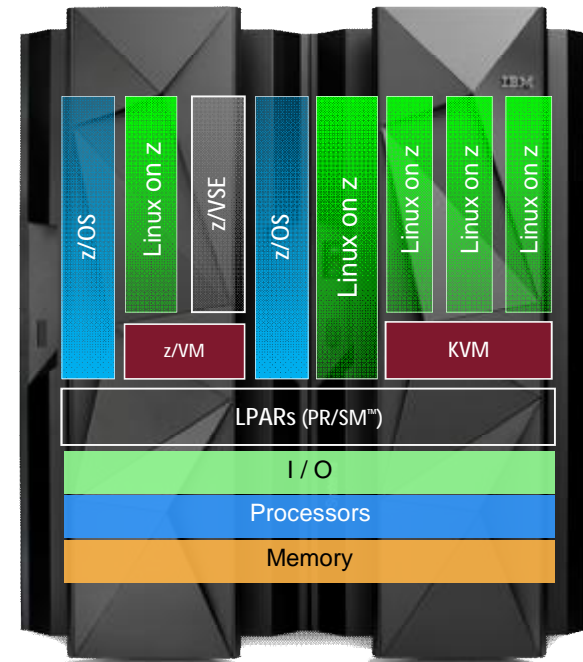
Client Pain Points

- Complexity and time required to implement server virtualization
- Virtualization vendor lock-in
- TCO for server virtualization solutions
- Closed proprietary solutions
- Lack of seamless integration with new cloud technologies like OpenStack

KVM Solution

- Simplifies configuration and operation of server virtualization
- Leverage common Linux admin skills to administer virtualization
- Provides an Open Source virtualization choice
- Lower cost virtualization alternative for Linux workloads
- Flexibility and agility leveraging the Open Source community
- Easily integrate into Cloud/OpenStack environments

- New software distribution of KVM on z Systems
- An additional option for virtualization on z Systems
- Coexistence with z/VM's support of Linux on z Systems
- The IBM commitment to z/VM remains steadfast



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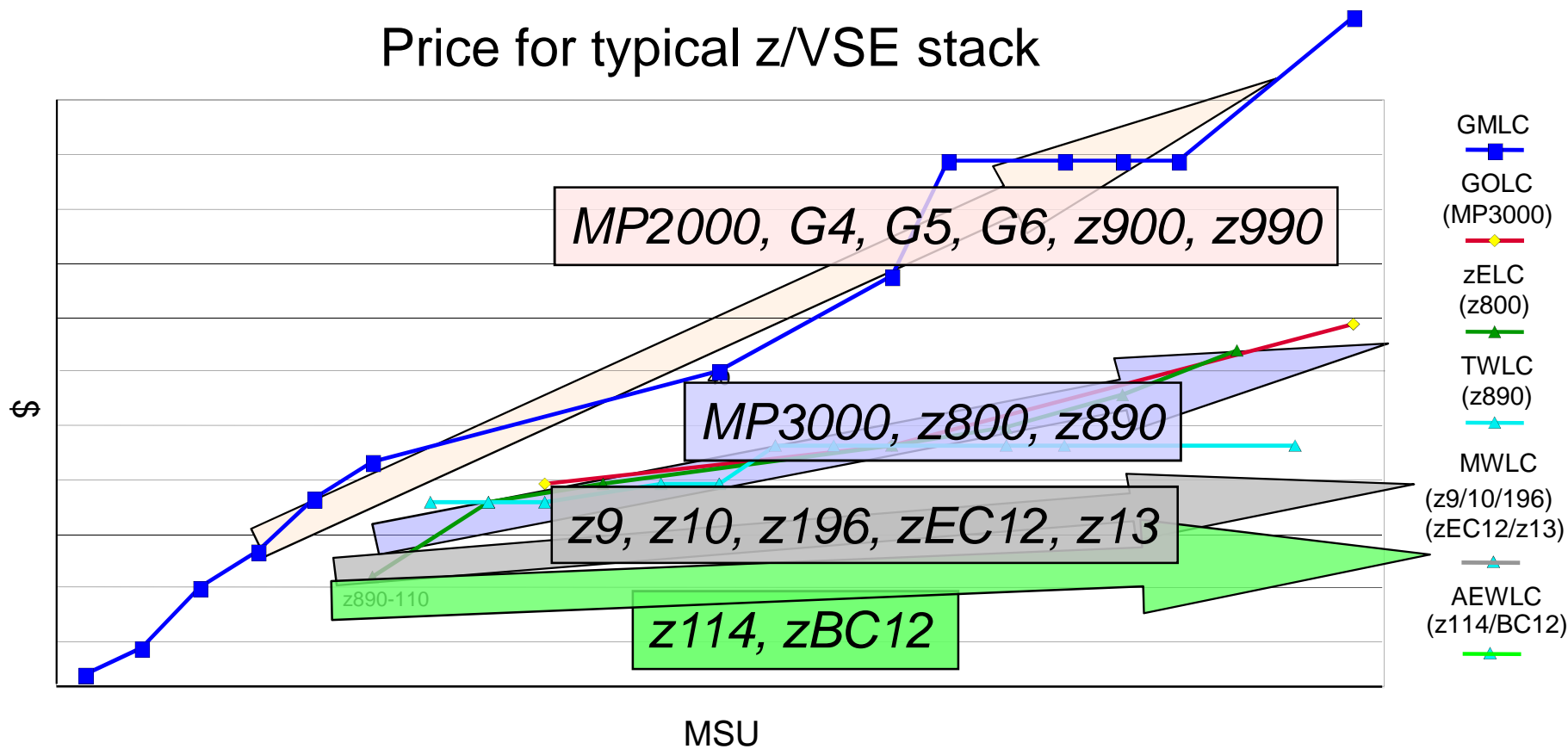
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z/VSE software pricing metrics



Price for typical z/VSE stack

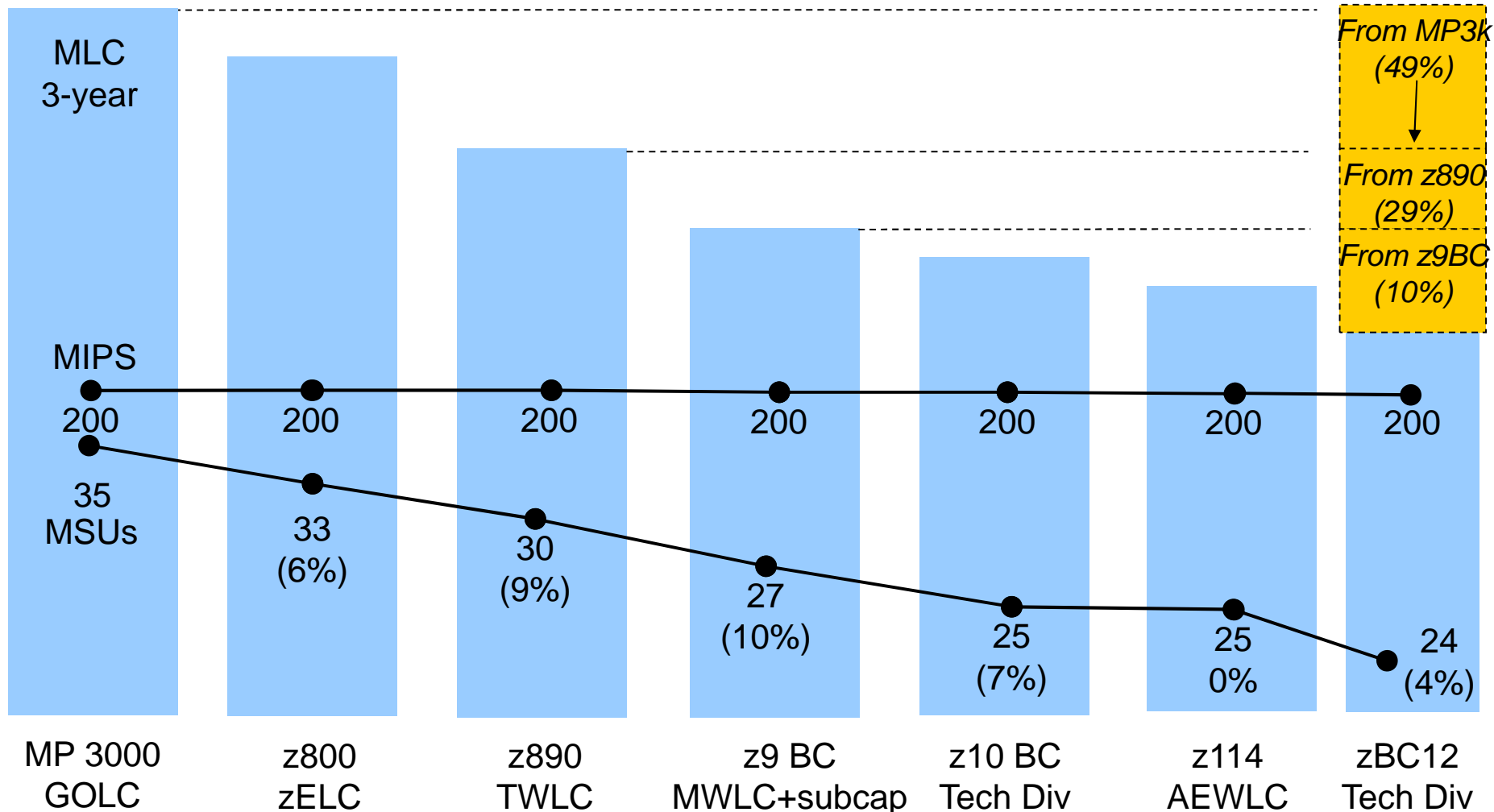


Typical z/VSE stack consists of z/VSE Operating System, LE, CICS TS, VTAM, TCP/IP, DB2



MLC price performance across hardware generations

Example shows a typical z/VSE software stack at 200 MIPS



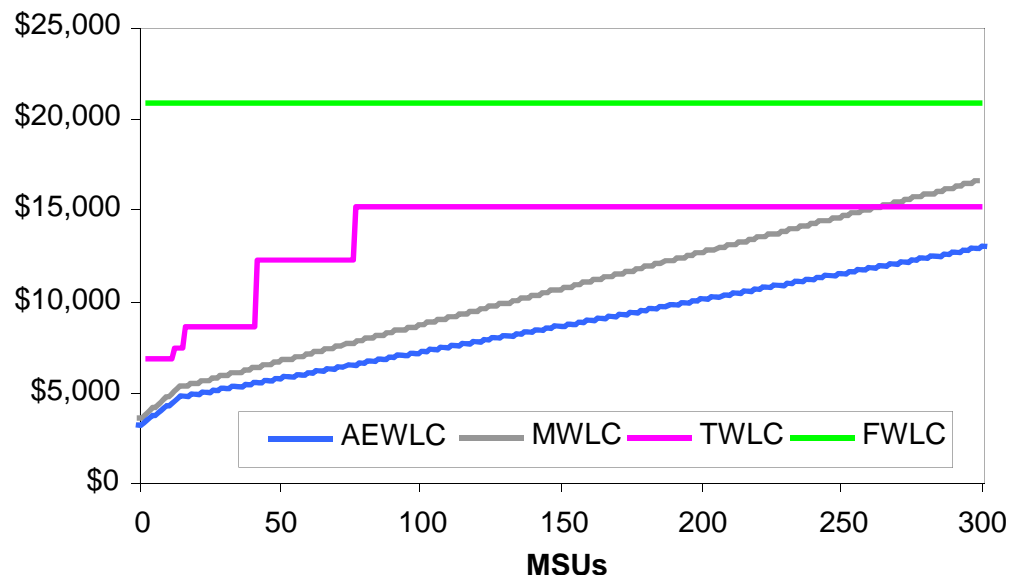
* MLC savings will vary significantly by customer - actual customer configuration must be priced out to be accurate.

* A typical z/VSE stack includes z/VSE CF, CICS TS, VTAM, TCP/IP, DB2, Ditto, Cobol, HLASM



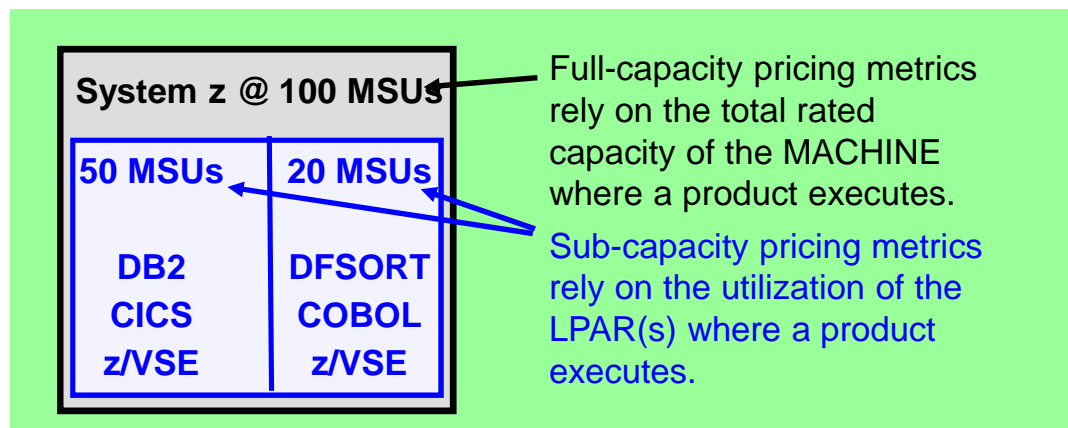
Additional MLC savings through sub-capacity pricing

- z/VSE price/performance through attractive new pricing metrics*
 - Midrange Workload License Charge (**MWLC**)
 - MWLC requires z9 EC/BC, z10 EC/BC, z196, zEC12 or z13 and current z/VSE software (i.e. z/VSE V4, V5 or V6)
 - Advanced Entry Workload License Charge (**AEWLC**)
 - AEWLC requires z114 or zBC12 and current z/VSE software (i.e. z/VSE V4, V5 or V6)



§ Additional price/performance through sub-capacity option

- Some hardware footprint **consolidations** more attractive now
- Presence of z/VSE V3 or VSE/ESA™ forces full-capacity pricing



(*) z9 BC A01, z10 BC A01, z114-A01, zBC12 entry model are priced zELC.

General Price Action (GPA) for select software products



Announced August 12, 2014, Effective January 1, 2015

§ Monthly License Charges (MLC) increased

- VWLC, AWLC, EWLC, PSLC, AEWLC (ie. z114 and zBC12)

§ Approx 4% MLC increase, depending on the features selected, e.g.

- DB2 Server for VSE and VM V7
- MQ Series for VSE/ESA V2
- WebSphere MQ for z/VSE V3
- C, COBOL, PL/I, HLASM for MVS, VM, VSE
- Rational COBOL RT for z/VSE

§ Approx 7% MLC increase for CICS for z/VSE products on all software billing metrics (ie. all servers, high-end and low-end)

- CICS/VSE V2
- CICS TS for VSE/ESA V1
- CICS TS for z/VSE V2 (when available)

§ No price change on IBM Boeblingen owned software products

- z/VSE V4 and z/VSE V5 MLC remained unchanged
- IPv6/VSE V1 and TCP/IP V1 MLC remained unchanged



z/VSE Linux Growth Offering



§ **Objective:** Provide z/VSE customers with a z/VM-Linux environment to expand into new workloads such as **C**loud, **A**nalytics, **M**obile, **S**ecurity, etc.

§ For z/VSE customers acquiring a zBC12* and z/VSE V5, the customer can receive all of the following components with the zBC12 and z/VSE V5 at the same price as the zBC12 and z/VSE V5:

- one IFL*
- incremental 32 GB memory (incremental to memory ordered for the zBC12)
- z/VM V6 (base and features) for the IFL (up to 10 Value Units)
- IBM Wave V1 for the IFL (up to 10 Value Units)
- z/VM S&S and IBM Wave S&S for the IFL for 3 years

§ **Requirements:**

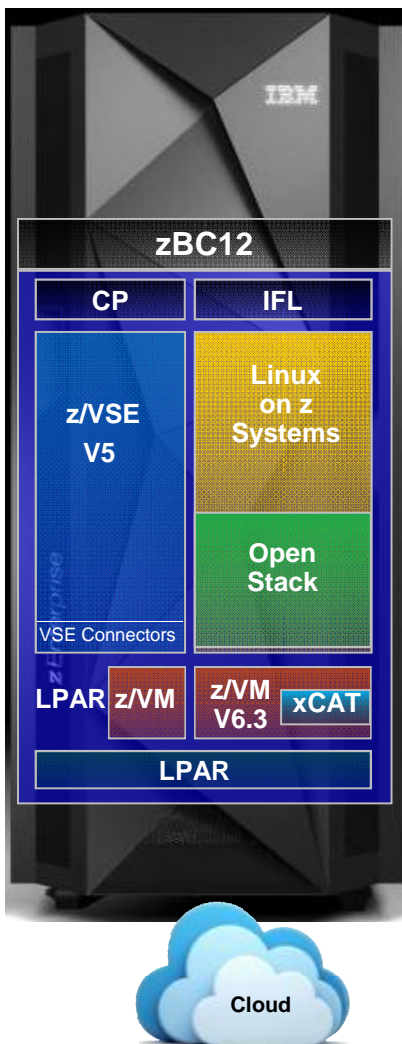
- Applicable to zBC12 C01 or larger
- All components must be ordered at the same time
- z/VSE V5 must be licensed at the same time as the server purchase (or earlier)

* Maintenance is not included in this offering

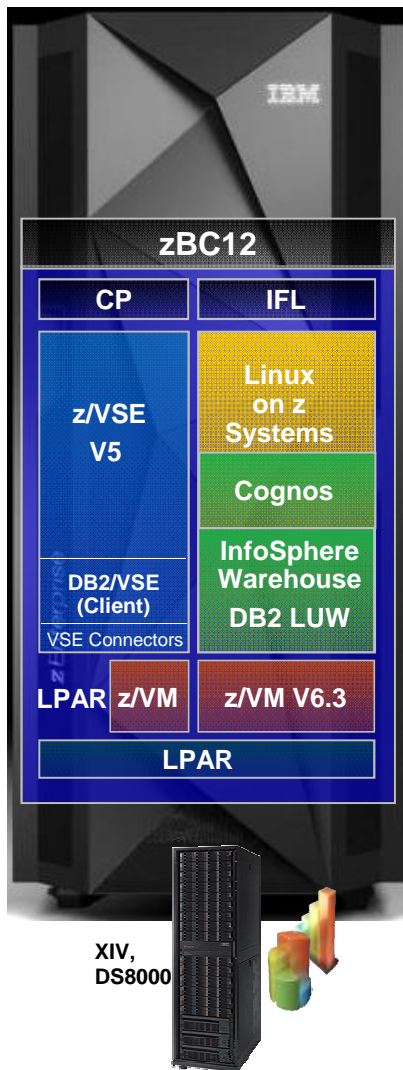
z/VSE Linux Growth Offering – CAMS solution examples



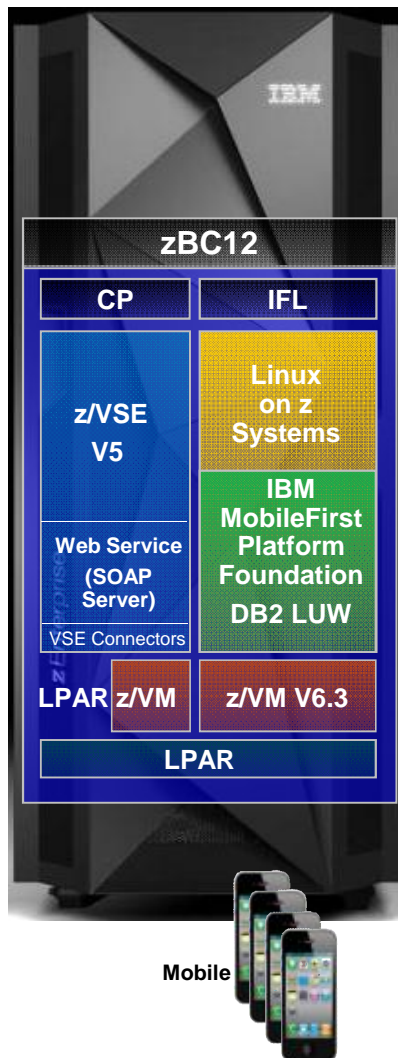
Cloud



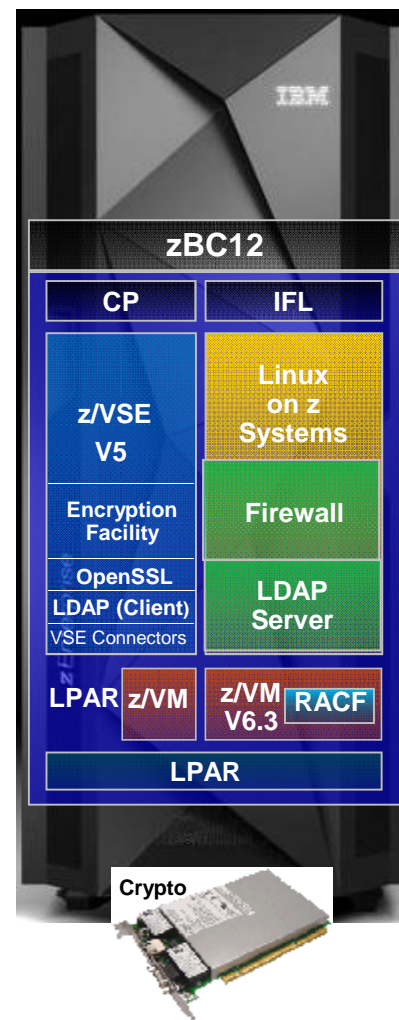
Analytics



Mobile



Security



and many more
....

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- **Software Pricing**
- • **Summary**

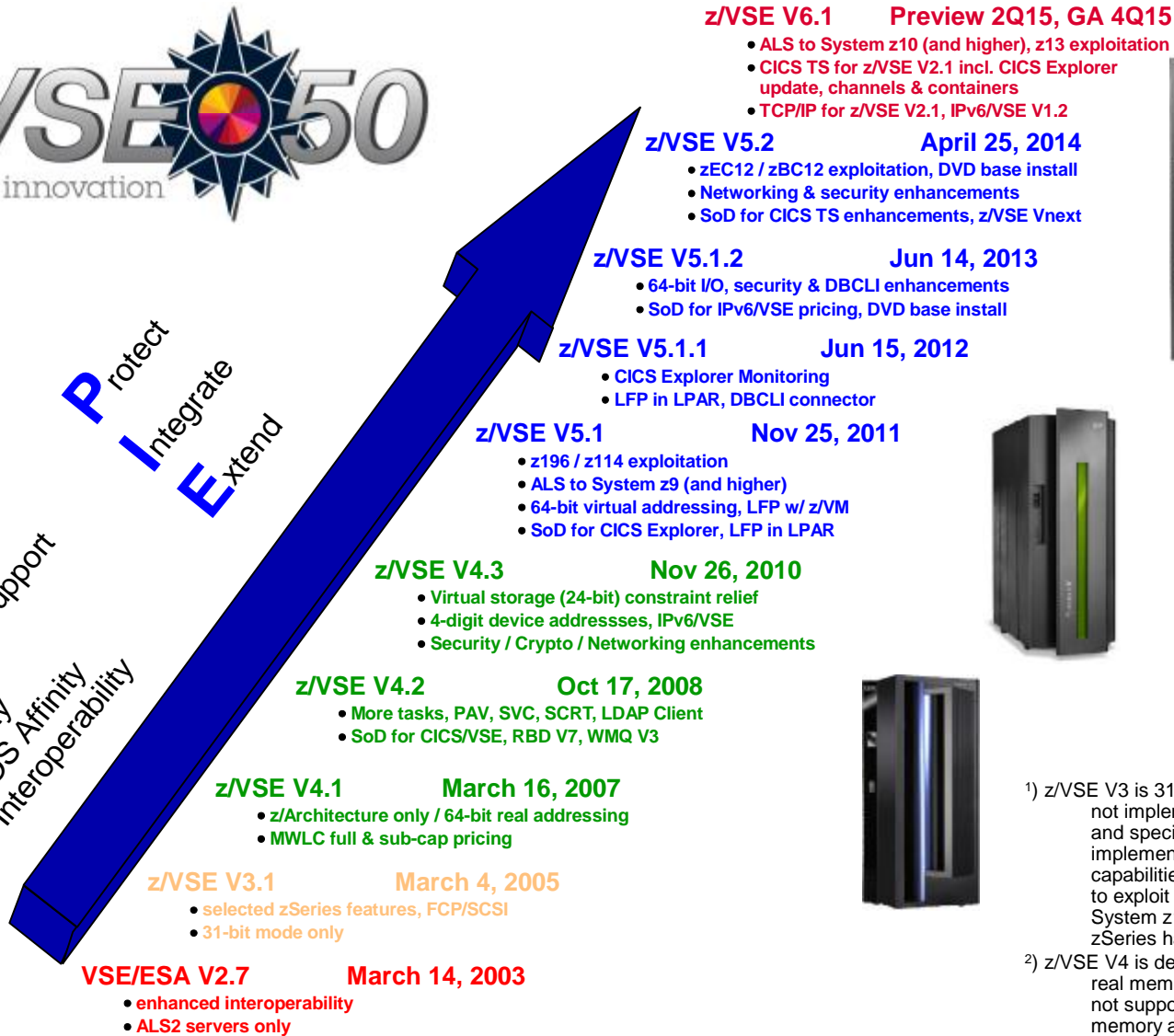


z/VSE continues to deliver customer value



Hardware Support
Capacity
Quality
z/OS Affinity
Interoperability

Protect
Integrate
Extend



1) z/VSE V3 is 31-bit mode only. It does not implement z/Architecture, and specifically does not implement 64-bit mode capabilities. z/VSE is designed to exploit select features of IBM System z10, System z9, and zSeries hardware.

2) z/VSE V4 is designed to exploit 64-bit real memory addressing, but will not support 64-bit virtual memory addressing

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