Dr. Klaus Goebel
IBM Research & Development, Boeblingen, Germany, kgoebel@de.ibm.com

What is New in z/VSE, z/VM, Linux on System z ?

5th European GSE / IBM Technical University, Berlin, Germany, October 2011

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DS8000	IBM logo*	System z10 Business Class	z9
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Agenda

- **IBM zEnterprise System**
- **z/VM**
- **Linux on System z**
- **z/VSE**
- **Summary**

IBM zEnterprise System - Best in Class Systems and Software Technologies:

A system of systems that unifies IT for predictable service delivery

Unified management for a smarter system: zEnterprise Unified Resource Manager

- Part of the IBM System Director family, provides platform, hardware and workload management
- Unifies management of resources, extending IBM System z® qualities of service across the infrastructure

The world's fastest and most scalable system: IBM zEnterprise™ 196 IBM zEnterprise™ 114

- Ideal for large scale data and transaction serving and mission critical applications
- Most efficient platform for Large-scale Linux® consolidation
- Leveraging a large portfolio of z/OS®, z/VSE™, and Linux on System z applications
- Capable of massive scale up, from 26 MIPS to more than 50 BIPS

Scale out to a trillion instructions per second: IBM zEnterprise BladeCenter® Extension (zBX)

- Selected IBM POWER7™ blades and IBM System x® Blades[1] for tens of thousands of AIX®, Linux, and Windows applications
- High performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high performance private network

[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

IBM zEnterprise Family

IBM zEnterprise 196 (2817)

- **Announced 7/10 – Server w/ up to 96 PU cores**
- **5 models – Up to 80-way**
- **Granular Offerings for up to 15 CPs**
- **PU (Engine) Characterization**
  - CP, SAP, IFL, ICF, zAAP, zIIP
- **On Demand Capabilities**
  - CoD, CIU, CBU, On/Off CoD, CPE
- **Memory – up to 3 TB for Server and up to 1 TB per LPAR**
  - 16 GB Fixed HSA
- **Channels**
  - PCIe bus
  - Four LCSSs
  - 3 Subchannel Sets
  - MIDAW facility
  - Up to 240 ESCON channels
  - Up to 288 FICON channels
  - FICON Express8 and 8S
  - zHPF
  - OSA 10 GbE, GbE, 1000BASE-T
  - InfiniBand Coupling Links
- **Configurable Crypto Express3**
- **Parallel Sysplex clustering**
- **HiperSockets – up to 32**
- **Up to 60 logical partitions**
- **Enhanced Availability**
- **Unified Resource Manager**
- **Operating Systems**
  - z/OS, z/VM, z/VSE, z/TPF, Linux on System z

IBM zEnterprise Blade Extension (2458)

- **Announced 7/10**
- **Model 002 for z196 or z114**
- **zBX Racks with:**
  - BladeCenter Chassis
  - N + 1 components
  - Blades
  - Top of Rack Switches
  - 8 Gb FC Switches
  - Power Units
  - Advance Management Modules
- **Up to 112 Blades**
  - IBM Smart Analytics Optimizer Solution
  - POWER7 Blades
  - IBM System x Blades
  - IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (M/T 2462-4BX)
- **Operating Systems**
  - AIX 5.3 and higher
  - Linux for Select IBM x Blades
  - Microsoft Windows for x Blades
- **Hypervisors**
  - PowerVM Enterprise Edition
  - Integrated Hypervisor for System x

IBM zEnterprise 114 (2818)

- **Announced 07/11**
- **2 models – M05 and M10**
  - Up to 5 CPs
- **High levels of Granularity available**
  - 130 Capacity Indicators
- **PU (Engine) Characterization**
  - CP, SAP, IFL, ICF, zAAP, zIIP
- **On Demand Capabilities**
  - CoD, CIU, CBU, On/Off CoD. CPE
- **Memory – up to 256 GB for Server**
  - 8 GB Fixed HSA
- **Channels**
  - PCIe bus
  - Two LCSSs
  - 2 Subchannel Sets
  - MIDAW facility
  - Up to 240 ESCON channels
  - Up to 128 FICON channels
  - FICON Express8 and 8S
  - zHPF
  - OSA 10 GbE, GbE, 1000BASE-T
  - InfiniBand Coupling Links
- **Configurable Crypto Express3**
- **Parallel Sysplex clustering**
- **HiperSockets – up to 32**
- **Up to 30 logical partitions**
- **Unified Resource Manager**
- **Operating Systems**
  - z/OS, z/VM, z/VSE, TPF, z/TPF, Linux on System z

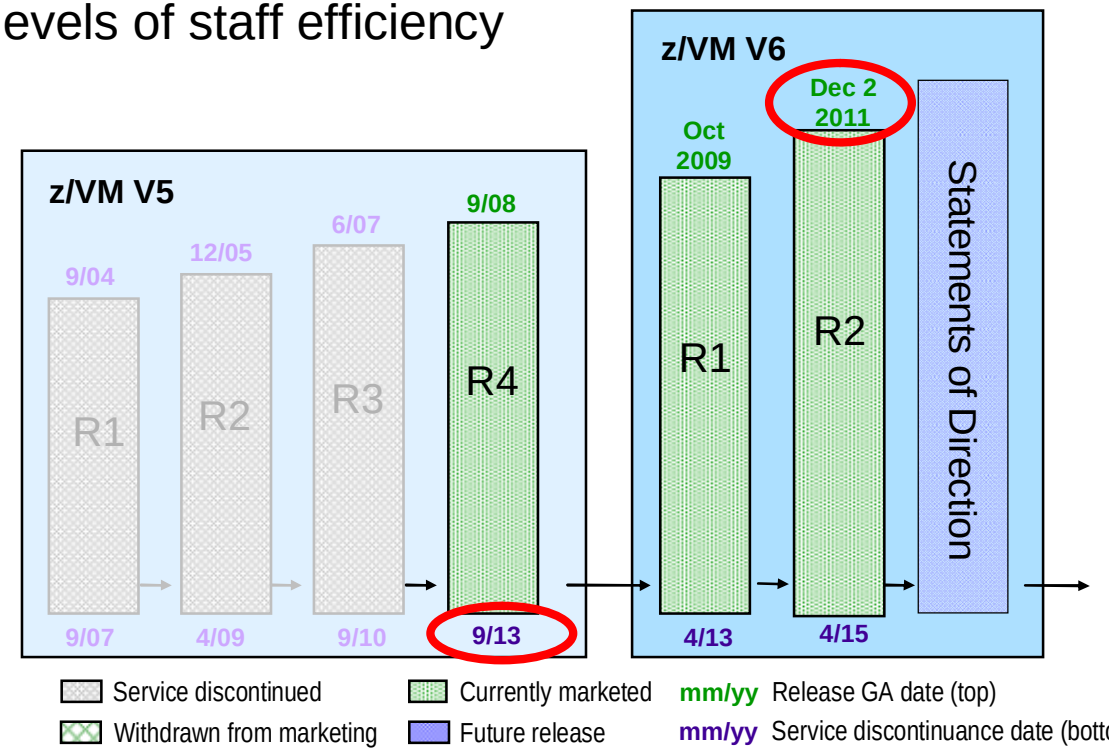
Agenda

- **IBM zEnterprise System**
- **z/VM**
  - **z/VM Release Status**
  - **New Announcement: z/VM V6.2**
  - **z/VM V6 Statements of Direction**
- **Linux on System z**
- **z/VSE**
- **Summary**

z/VM Release Status

z/VM: helping clients "do more with less"

Higher core-to-core consolidation ratios
Higher levels of resource sharing and utilization
Higher levels of staff efficiency



Future enhancements:

- **Hardware and I/O**
- **Ensemble management**
- **z/OS and Linux synergy**
- **Single System Image**
- **Virtualization**
- **Networking**
- **Security**

IBM received EAL 4+ certification of z/VM V5.3 from the German Federal Office of Information Security (Bundesamt für Sicherheit in der Informationstechnik) for conformance to the Controlled Access and Labeled Security protection profiles (CAPP and LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408. z/VM V6.1 is currently undergoing evaluation against OSPP with the labeled security extention at EAL 4+.

z/VM Version 6 Release 2

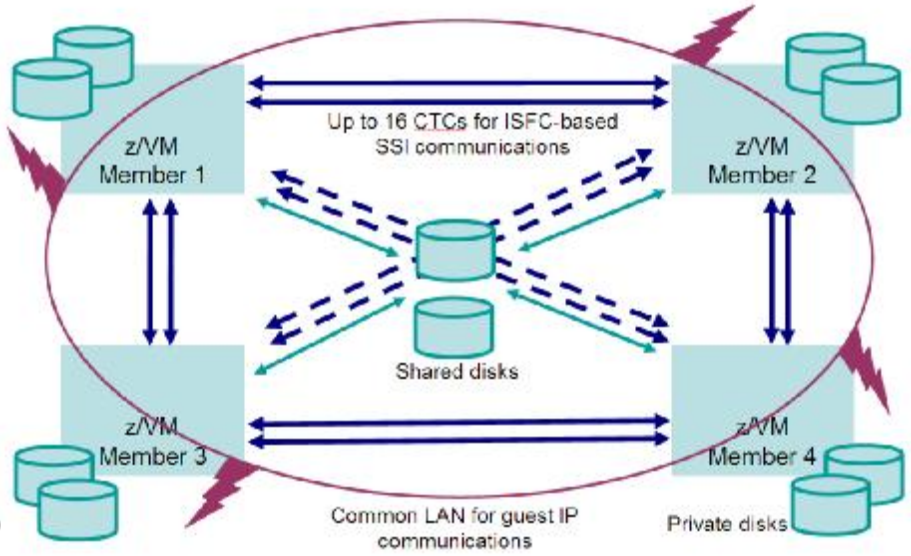
- **Key dates:**
  - Announced **October 12, 2011**
  - z/VM 6.2 may be ordered on **November 29, 2011**
  - Generally available **December 2, 2011**
  - End of service **April 30, 2015**
  - z/VM V6.1 will be withdrawn when V6.2 becomes available

- **Major enhancements in z/VM 6.2 include:**
  - Single System Image
  - Live Guest Relocation
  - Turnkey support for Unified Resource Manager

z/VM V6.2

Single System Image, Clustered Hypervisor, Live Guest Relocation

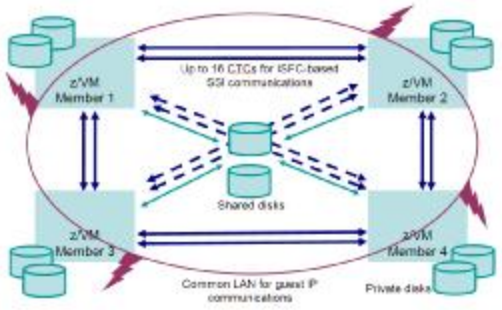
- Provided as an optional priced feature
- Connect up to four z/VM systems as members of a **Single System Image** (SSI) cluster
- Provides a set of shared resources for member systems and their hosted virtual machines
  - Directory, minidisks, spool files, virtual switch MAC addresses
- Cluster members can be run on the same or different z10, z196, or z114 servers
- Simplifies systems management of a multi-z/VM environment
  - Single user directory
  - Cluster management from any member
    - Apply maintenance to all members in the cluster from one location
    - Issue commands from one member to operate on another
  - Built-in cross-member capabilities
  - Resource coordination and protection of network and disks



- Dynamically move Linux guests from one z/VM member to another with **Live Guest Relocation** (LGR)
  - Reduce planned outages; enhance workload management
  - Non-disruptively move work to available system resources **and** non-disruptively move system resources to work
  - When combined with Capacity Upgrade on Demand, Capacity Backup on Demand, and Dynamic Memory Upgrade, you will get the best of both worlds

What is special about an SSI / LGR Cluster ?

- SSI provides for a set of shared resources that can be used by both CP and virtual machines, with full awareness of such sharing by CP
  - Directory, minidisks, spool files, virtual switches, dedicated devices
- User can logon to any member of the cluster
- Disconnected user can be moved to any member of the cluster while the user's virtual machine is running
- LGR is initiated by a privileged command in z/VM 6.2



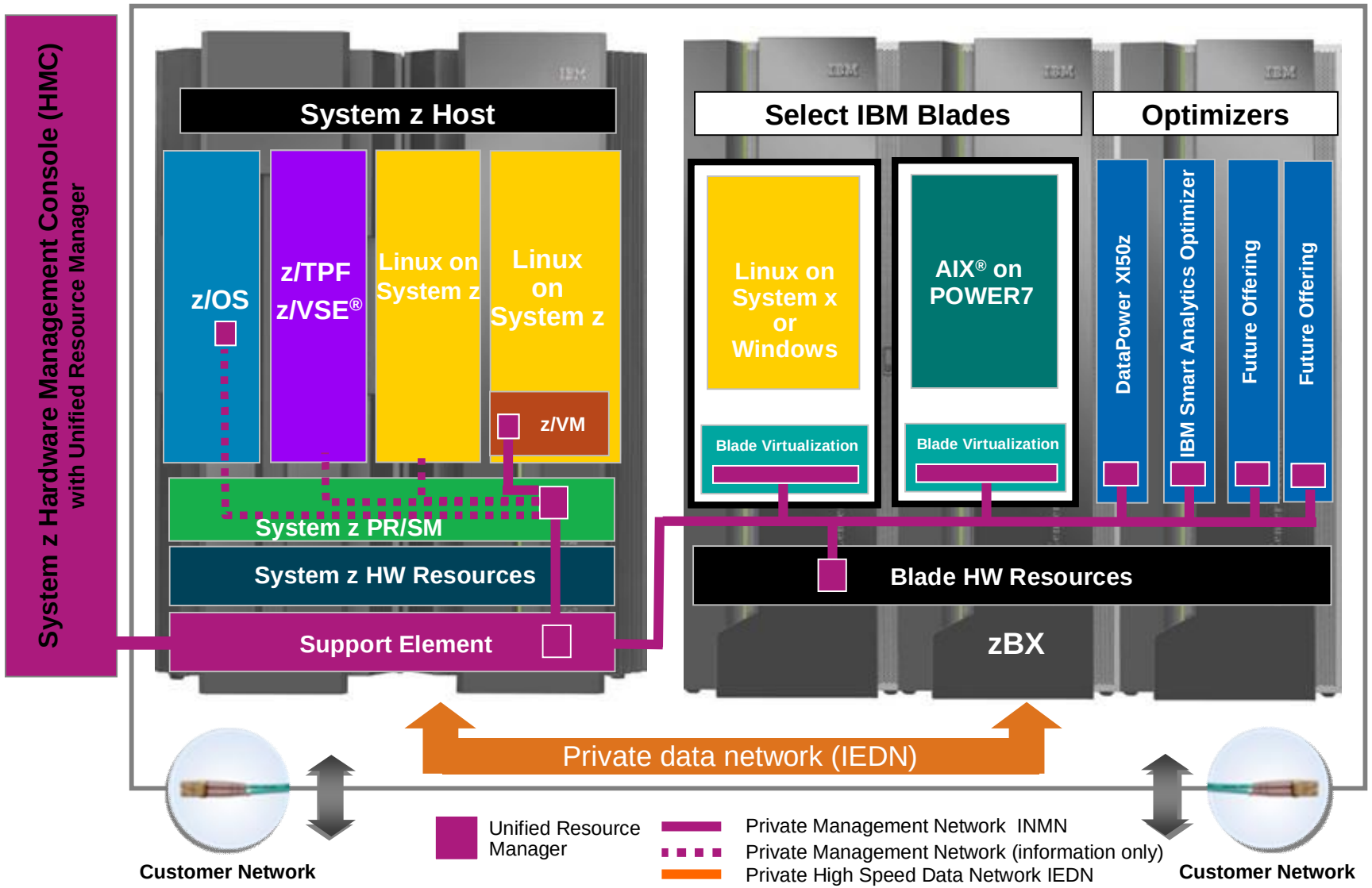
Restrictions (examples):

- A guest is not relocatable when …
  - It is anything other than Linux
  - It is using a resource that doesn't exist on the target system
  - It owns a resource that other users depend on and that would be inaccessible if the guest were to relocate
  - It is using a facility which is not relocatable (e.g., CFVM)
- No long-distance connections
- 3390 installation only
  - System state disk must be ECKD, post-installation use of SCSI is OK

- IBM Director does not support SSI and LGR
- zEnterprise Unified Resource Manager does not support SSI and LGR

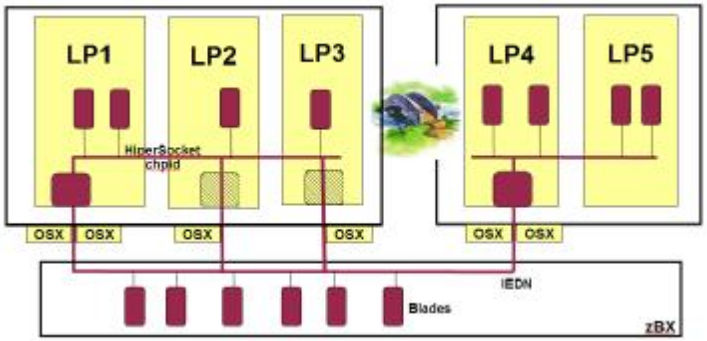
Putting zEnterprise System to the Task

Use the smarter solution to improve your application design



News with z/VSE, z/VM and Linux on System z

z/VM V6 Statements of Direction*



- **New functions:**
  - HiperSockets VSWITCH Integration with IEDN
    zEnterprise IEDN (OSX) or OSD connections
  - HiperSockets Completion Queue
    Transfer HiperSockets messages asynchronously
  - High Performance FICON
    Enable z/VM guests to use zHPF; z/OS and Linux on System z provide exploitation
  - Support for GDPS / PPRC 3.8
    Disk subsystem preemptive HyperSwap
- **Withdrawals:**
  - Stabilization of Performance Toolkit RMFPMS agent
    Performance Toolkit processing of the output from Linux rmfpms agent, part of the z/OS RMF PM offering, will no longer be updated

    Support for the Linux rmfpms agent was already withdrawn, but continues to be available as-is
  - Withdrawal of HMC non-ensemble z/VM System Management
    z/VM V6.2 is the last release of z/VM that will be supported by the non-ensemble z/VM System Management functions of the System z10, z196 and z114
  - Withdrawal of Cross System Extension (CSE)
    The VMSSI feature replaces the functions provided by CSE and brings additional value such as autonomic minidisk cache management and a single point of maintenance

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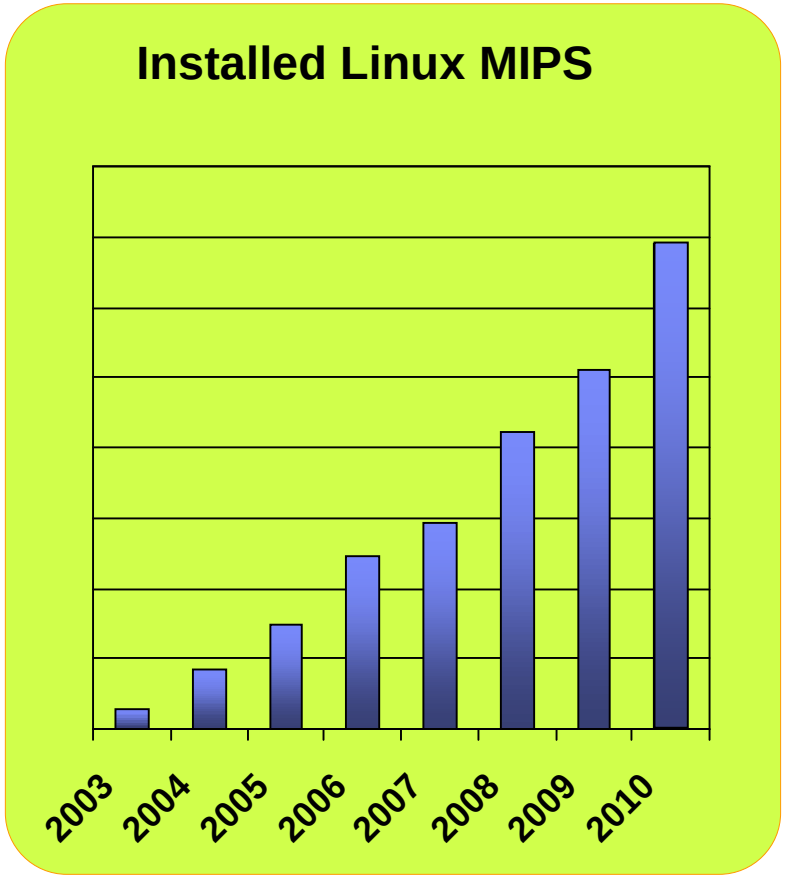
Agenda

- **IBM zEnterprise System**
- **z/VM**
- **Linux on System z**
  - **IBM Offerings for Linux on System z**
  - **IaaS Cloud Computing**
  - **Linux Distributions for System z**
  - **Select Solutions**
- **z/VSE**
- **Summary**

Linux on IBM System z

The momentum continues

- **Growth from 2009 to 2010:**
  - Shipped IFL volumes increased 34%
  - Installed IFL MIPS increased 35%
- **32% of System z customers have IFLs installed**
- **64 of the Top100 System z clients are running Linux on the mainframe**
- **Two Linux partners: SUSE and Red Hat**
- **Gold standard in virtualization with z/VM®**
- **More than 3,100 applications are available for Linux on System z**
  - Over 70% of new ISV partners in 2010 support Linux on System z



Examples of WW Top Linux on System z Installations

	Customer	IFL MIPS	# IFLs
	Asian Banking/Finance/Investment Industry		
	Asian Banking/Finance/Investment Industry		
	US Banking/Finance/Investment Industry		
	US Federal Government Agency		
	US Services industry		
	US Banking/Finance/Investment Industry		
	Asian Banking/Finance/Investment Industry		
	US Insurance/Investment Industry		
	European Technology Manufacturing Industry		
	US Banking/Finance/Investment Industry		
	Asian Banking/Finance/Investment Industry		
	US Insurance/Investment Industry		
	US Retail Industry		
	US State Government		
	South American Services Industry		
	Asian Telecommunications Industry		
	US Health Care Industry		
	US Services Industry		
	European Telecommunications Industry		
	Asian Manufacturing Industry		
	US Health Care Industry		

IBM Linux on System z Offerings for Large Scale Consolidation

Enterprise Linux Server

A dedicated IBM zEnterprise 114, IBM zEnterprise 196 or System z10 server

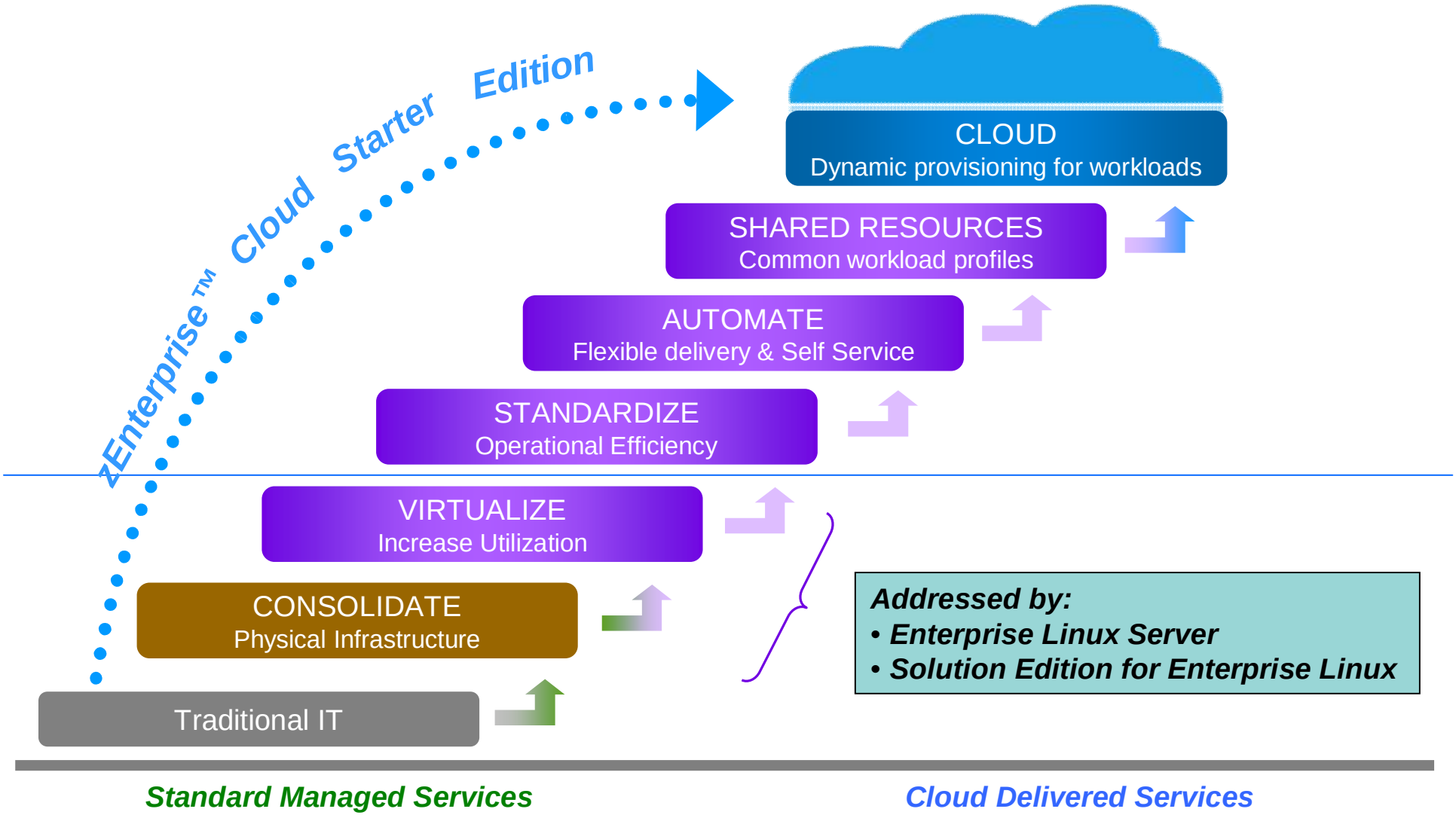
Solution Edition for Enterprise Linux

Additional capacity on an installed IBM zEnterprise z114, IBM zEnterprise 196 or System z10 server

- Offerings include
  - System z IFL specialty processors, memory, and I/O connectivity
  - Hardware maintenance for three to five years
  - z/VM virtualization software package with three to five years of subscription and support
- The Linux distribution partner, Red Hat and SUSE, are partnering with IBM and support the offerings with specific promotions.
- Very competitive pricing
  - Competitive TCA with scalable Linux and UNIX alternatives
  - Total Cost of Ownership and Qualities of Service that blow away the competition
  - Price / performance improves as you grow your environment
  - Able to host up to thousands of servers in a single system
  - $500 per year per virtual server (TCA: hardware, virtualization software, memory, maintenance)*

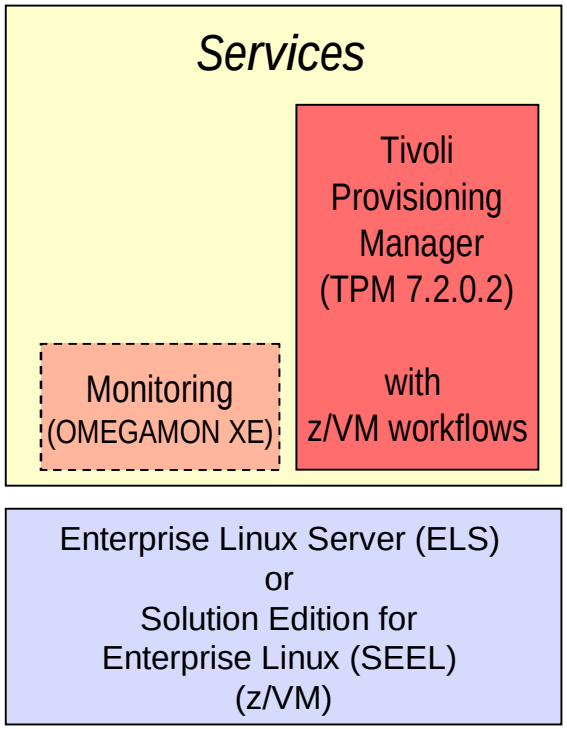
* Distributed server comparison is based on IBM cost modeling of Linux on zEnterprise vs. alternative distributed servers. Given there are multiple factors in this analysis such as utilization rates, application type, local pricing, etc., savings may vary by user.

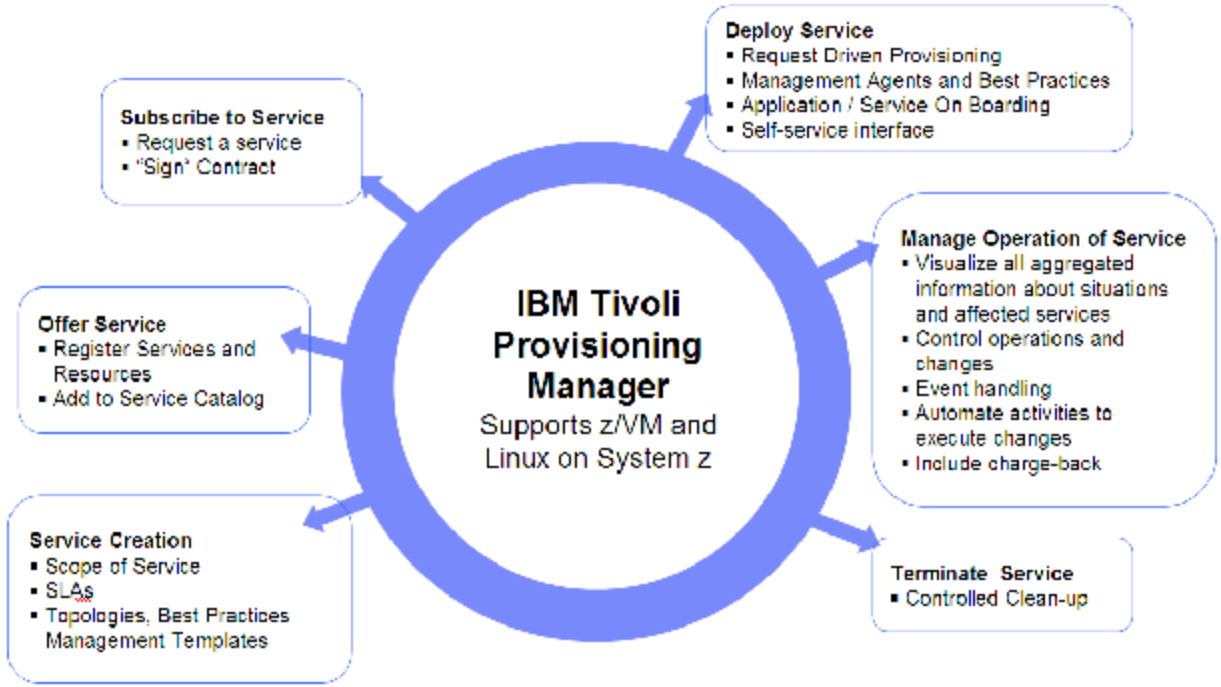
How zEnterprise™ Cloud Starter Edition helps in the Journey to Cloud



zEnterprise™ Cloud Starter Edition

Solution focused on establishing an Infrastructure as a Service (IaaS) delivery model





Built on top of Enterprise Linux Server or Solution Edition for Enterprise Linux

- Allows customers to create a Cloud IaaS environment
- Integrates into customer's self-service UI
- Resource monitoring provided by OMEGAMON XE for z/VM and Linux
- IBM Lab Based Services provide rapid provisioning with newly created z/VM workflows

Universita di Bari

Innovative Cloud Solutions

Wine Market

Support for 60 wineries to determine demand and get best market price

Fish Market

Electronic fish auction for fishermen while on boats

MoniCA

Logistics solution tracks and collects data real time

Solution Edition for Cloud Computing

BENEFITS to Clients

Cloud computing allows multiple organizations to tap into heavy-duty computing power at minimal cost.

It lowers the barrier for local businesses to benefit from this technology.

UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Solve community challenges

Universita di Bari, established in 1924, is developing cloud-based solutions for a consortium of companies and universities from five regions of southern Italy.

News with z/VSE, z/VM and Linux on System z http://www-03.ibm.com/press/us/en/pressrelease/32051.wss

PVU Table

Processor Value Units

PVU Website Link:
click here

http://ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

PVU Table per Core (section 1 of 2 - RISC and System z)

Processor Technologies													
Processor Brand				Processor Type									
				Cores per socket									
Processor Vendor	Processor Name	Server model numbers	Maximum number of sockets per server	One-Core (1)	Dual-Core (2)	Quad-Core (4)	Hexa-Core (6)	Octi-Core (8)	16-Core (16)	IFL Engine	Proc. Model Number	PVUs per Core
IBM	POWER7 [4]	770,780,795	> 4			■	■	■			All	120
		750,755,775 PS704	4				■	■			All	100
		PS700-703, 710-740	2			■	■	■			All	70
	POWER6	550,560,570, 575,595	All		■						All	120
		520, JS12,JS22, JS23,JS43	All		■						All	80
	POWER5, POWER4	All	All		■						All	100
	POWER5 QCM	All	All			■					All	50
	z196, System z10 [1,5]	All	All							■	All	120
	z114, System z9 z990, S/390 [1,2,6]	All	All							■	All	100
	PowerPC 970	All	All		■						All	50
	PowerXCell™, Cell/B.E.™ 8i [3]	All	All	■							All	30
HP / Intel®	Itanium® 1,2	All	All		■	■					All	100
	PA-RISC	All	All		■						All	100
Sun / Fujitsu	SPARC64 VI, VII	All	All		■	■					All	100
	UltraSPARC IV	All	All		■						All	100
	SPARC T3	All	All					■	■		All	70
	UltraSPARC T2	All	All			■	■	■			All	50
	UltraSPARC T1	All	All			■	■	■			All	30
Any	Any single-core	All	All	■							All	100

* Requirements as of Publish Date: July 12, 2011

System z

Notes:
1) Each Integrated Facility for Linux (IFL) or Central Processor (CP) engine is equivalent to 1 processor core.

2) Refers to System z9, eServer zSeries, or System/390 servers.

3) Entitlements required for Power Processor Element (PPE) cores only.

4) The PVU requirement for the POWER7 processor technology is dependent on the maximum possible number of sockets on the server.

5) z196 refers to IBM zEnterprise 196

6) z114 refers to IBM zEnterprise 114

Enterprise Linux Distributions for System z

The table below shows IBM tested Linux environments. IBM remote technical support for these environments is provided when you obtain a Support Line contract. You may also find support for these environments by contracting with a third party provider.

Hardware Platform and Operating System Software Compatibility 64-bit environment				
Release	**zSeries**	**System z9**	**System z10**	**zEnterprise**
SLES 9 (*)	✓	✓	✓	✓ (2)
SLES 10	✓	✓	✓	✓
SLES 11	✗	✓	✓	✓
RHEL 4 (*)	✓	✓	✓	✓ (1)
RHEL 5	✓	✓	✓	✓
RHEL 6	✗	✓	✓	✓

(1) RHEL 4.8 only. Some functions have changed or are not available with the z196, e.g. the Dual-port OSA cards support to name one of several.
(2) SLES 9 SP4 + latest maintenance updates only. Some functions have changed or are not available with the z196,
(*) Also available as 31-bit distribution.
Note: The listed distributions are 64-bit distributions, they all include the 31-bit emulation layer to run 31-bit software products.

For information on which HW is supported by:

- Red Hat: https://hardware.redhat.com/hwcert/index.cgi
- SUSE: http://developer.novell.com/yessearch/Search.jsp
- System Storage: http://www.ibm.com/systems/support/storage/config/ssic/index.jsp

Linux on System z Distributions (Kernel 2.6 based)

- **SUSE Linux Enterprise Server 9 (GA 08/2004)**
  - Kernel 2.6.5, GCC 3.3.3, Service Pack 4 (GA 12/2007)

- **SUSE Linux Enterprise Server 10 (GA 07/2006)**
  - Kernel 2.6.16, GCC 4.1.0, Service Pack 4 (GA 05/2011)

- **SUSE Linux Enterprise Server 11 (GA 03/2009)**
  - Kernel 2.6.27, GCC 4.3.3, Service Pack 1 (GA 06/2010), Kernel 2.6.32

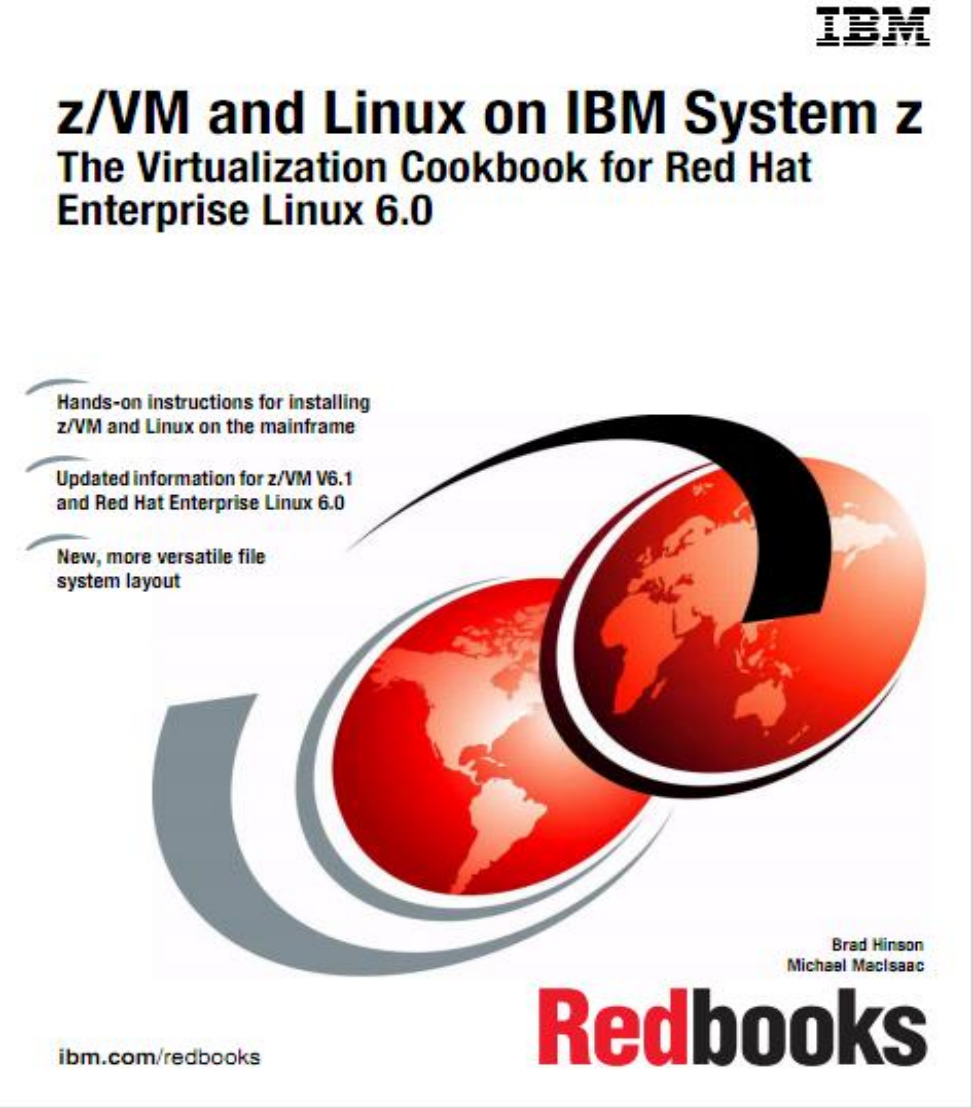
- **Red Hat Enterprise Linux AS 4 (GA 02/2005)**
  - Kernel 2.6.9, GCC 3.4.3, Update 9 (GA 02/2011)

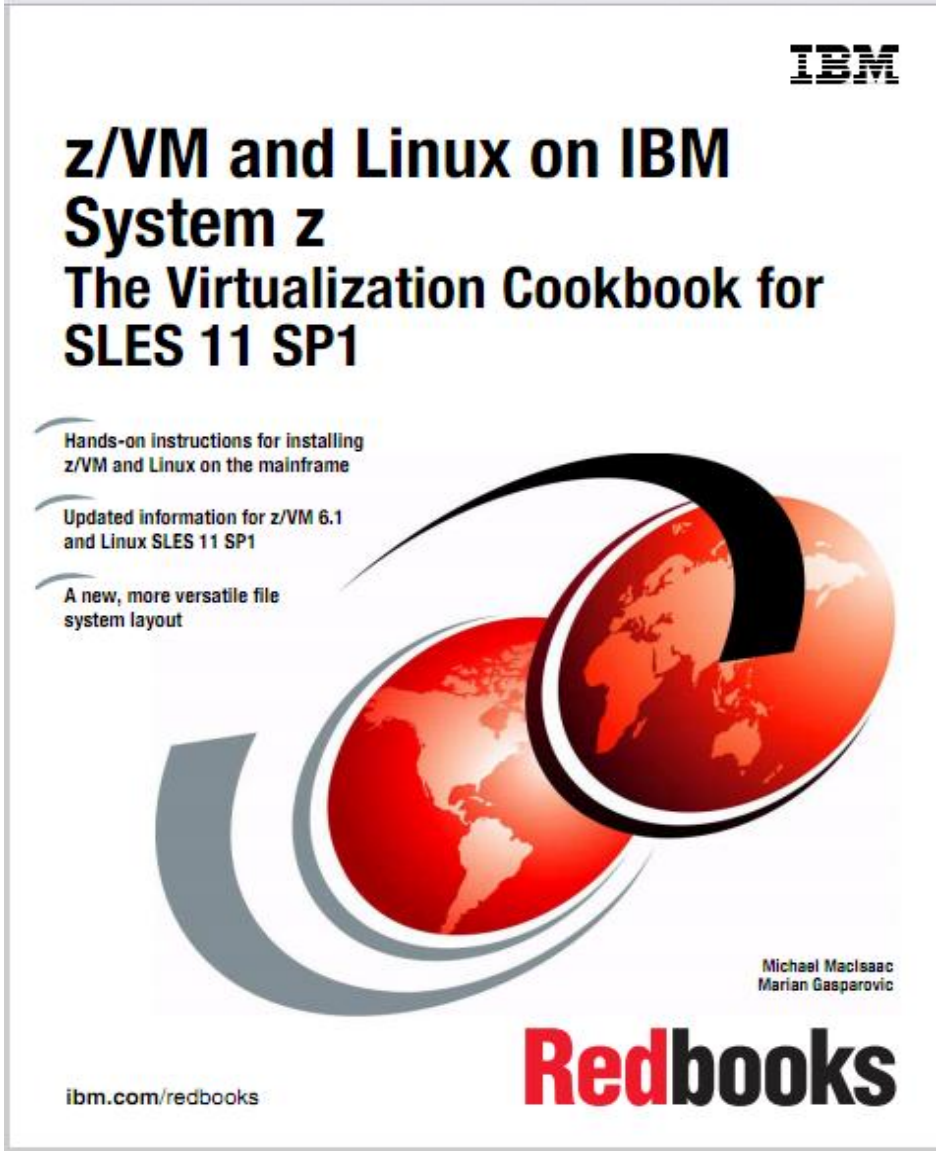
- **Red Hat Enterprise Linux AS 5 (GA 03/2007)**
  - Kernel 2.6.18, GCC 4.1.0, Update 6 (GA 05/2011)

- **Red Hat Enterprise Linux AS 6 (GA 11/2010)**
  - Kernel 2.6.32, GCC 4.4.0, Update 1 (GA 05/2011)

Two new Redbooks just got released !

Visit http://www.redbooks.ibm.com



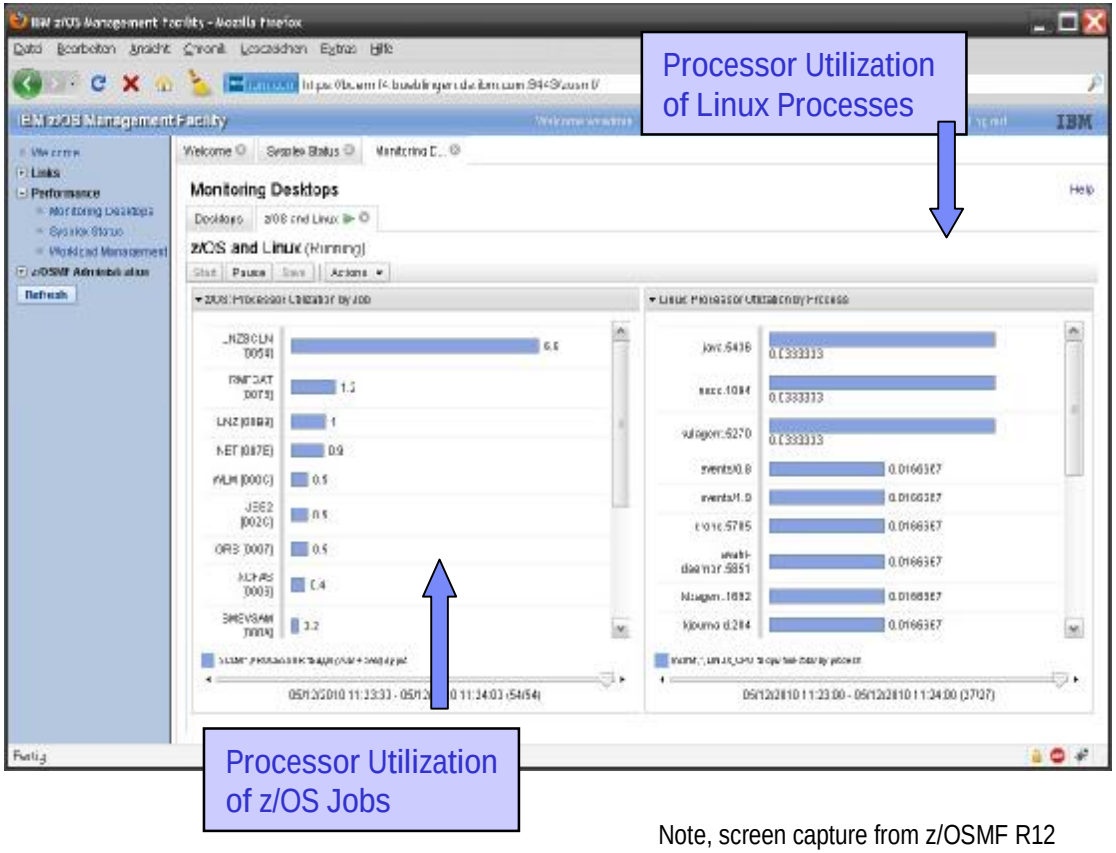


Integrated z/OS and Linux Resource Monitoring

A monitoring solution for multi-tier workloads

- **Monitor the resources for z/OS and Linux workloads**
- **Ideal for use with System z Enterprise System**

- **For z/OSMF R12**
  - Use separate as-is, no-charge web-download tool to gather resource information for Linux systems.
- **For z/OSMF R13**
  - New integrated performance data gatherers for Linux on System z, Linux on IBM System x®, and AIX® systems
  - Additional monitoring capabilities for your zEnterprise System



Note, screen capture from z/OSMF R12

IBM Cognos BI 10.1 for Linux on System z

Product Capabilities

- Query and Reporting
- Analysis
- Dashboarding
- Real-time Monitoring
- Cognos Mobile
- Cognos Active Report
- Cognos for Microsoft Office
- Cognos Business Insight
- Collaborative BI

- Not Supported:
  - Cognos Mash-up Service
  - Scorecarding
  - Statistics - (integrated solution – SPSS 19 is supported but not integrated through Cognos BI for Linux on System z)
  - Planning & Forecasting

Initial Conformance

Operating System	§ SLES 10, 11 § RHEL 4, 5
Database Support	§ DB2 for z/OS 8.1, 9 § DB2 LUW 9.5, 9.7 § Oracle 10g R2, 11g R1, 11g R2 § InfoSphere Warehouse Cubing Services 9.5.2, 9.7.x § InfoSphere Federation Server 9.5 § PowerCubes § Cognos TM1 9.4, 9.5, 9.5.1, 9.5.2 § SAP BW 3.5 via Dynamic Query Mode § Cognos TM1 9.5, 9.5.1 via Dynamic Query Mode
Application Server	§ Apache Tomcat § WebSphere 6.1, 7.0 (31-bit, 64-bit)
Content Store	§ DB2 LUW 9.5. 9.7 § DB2 for z/OS 8.1, 9 § Oracle 10g R2, 11g R1, 11g R2
Directory Server	§ IBM Tivoli 6.1 § LDAP version 3 compliant server
Web Server	§ IBM HTTP Server 6.0, 6.1, 7.0 § Apache HTTP Server 2.0.48, 2.2

Agenda

- **IBM zEnterprise System**
- **z/VM**
- **Linux on System z**
- **z/VSE**
  - **z/VSE Release Status**
  - **z/VSE and zEnterprise**
  - **New Announcement: z/VSE V5.1**
  - **z/VSE V5 Statements of Direction**
- **Summary**

z/VSE Evolution

z/VSE V5.1 Nov 25, 2011

NEW

- zEnterprise exploitation
- ALS to System z9 (and higher)
- 64-bit virtual addressing

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
- Crpto Express3 (April 30, 2010)
- IPv6/VSE* (May 28, 2010)

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
- ALS2 servers only

VSE/ESA V2.6 Dec 14, 2001

- last release to support pre-G5 servers

Protect
Integrate
Extend

Hardware Support
Capacity
Quality
z/OS Affinity
Interoperability

[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

* IPv6/VSE is a registered trademark of Barnard Software, Inc.

z/VSE Support Status (as of Oct'2011)

VSE Version and Release	Marketed	Supported	End of Support
z/VSE V4.3	a	a	tbd
z/VSE V4.2	r	a	10/31/2012
z/VSE V4.1 [2)]	r	r	04/30/2011
z/VSE V3.1 [1)]	r	r	07/31/2009
VSE/ESA V2.7	r	r	02/28/2007

On August 2, 2011, IBM announced withdrawal of service for CICS/VSE V2.3, DL/I DOS/VS V1.10, and DL/I VSE V1.11, to become effective October 31, 2012.

[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

z/VSE Support for IBM Mainframe Servers

IBM Servers	z/VSE V5.1	z/VSE V4.3	z/VSE V4.2	z/VSE V4.1 (out of service)
IBM zEnterprise z196 & z114	a	a	a	a
IBM System z10 EC & z10 BC	a	a	a	a
IBM System z9 EC & z9 BC	a	a	a	a
IBM eServer zSeries 990 & 890	r	a	a	a
IBM eServer zSeries 900 & 800	r	a	a	a

On June 14, 2011, IBM announced withdrawal of service for Multiprise 3000 (7030-H30, -H50, -H70), to become effective December 31, 2012.

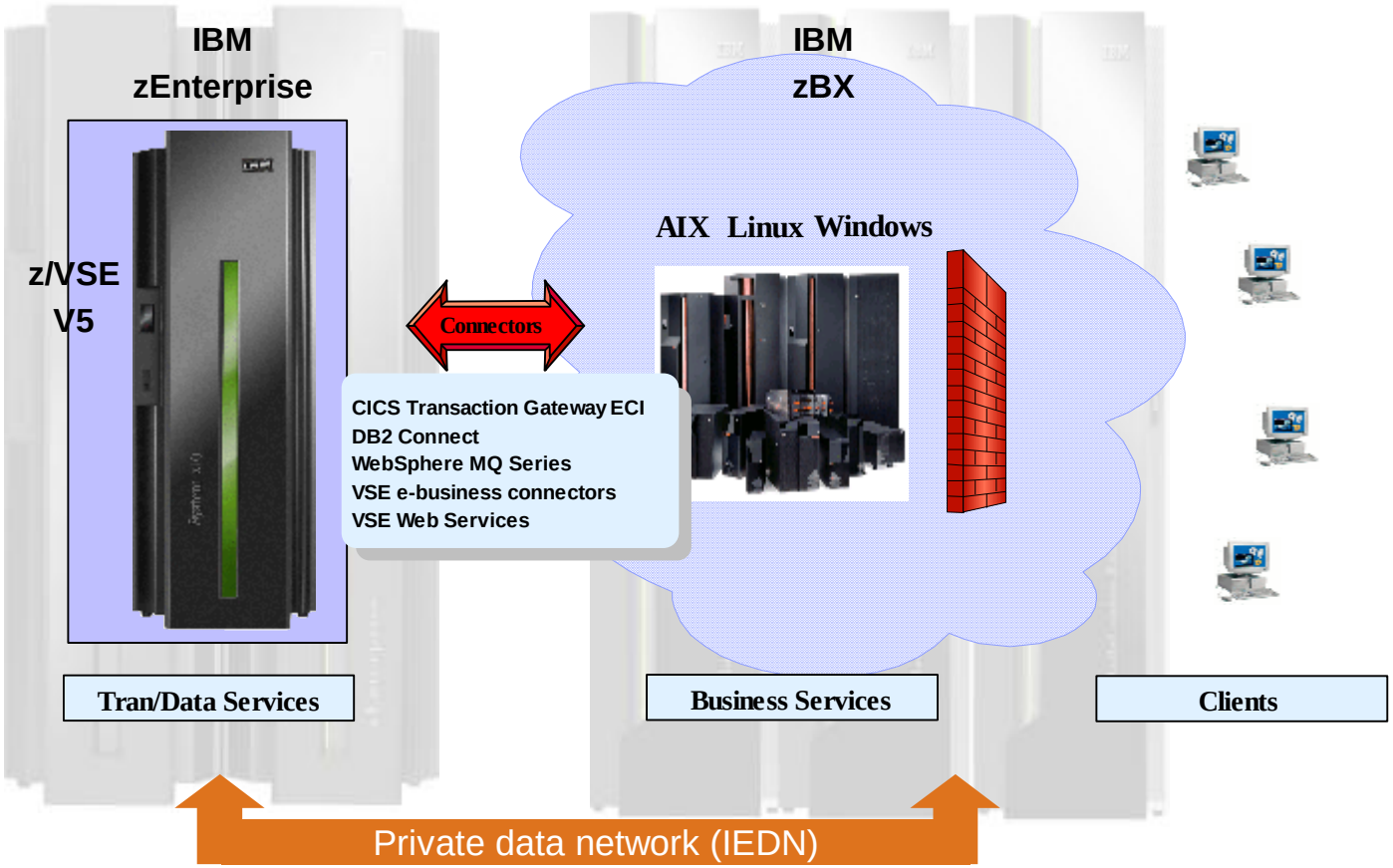
Please note:

- z/VM V6 requires System z10 technology (or higher)
- Novell SLES 11 requires System z9 technology (or higher)
- Red Hat RHEL 6 requires System z9 technology (or higher)

z/VSE V5 Strategy with zEnterprise - More options, highly integrated

alias

- § 3-tier Strategy
- § **Hybrid Strategy**
- § Connector Strategy
- § Migration Strategy
- § Coexistence Strategy
- § Linux Surround Strategy
- § **PIE Strategy**

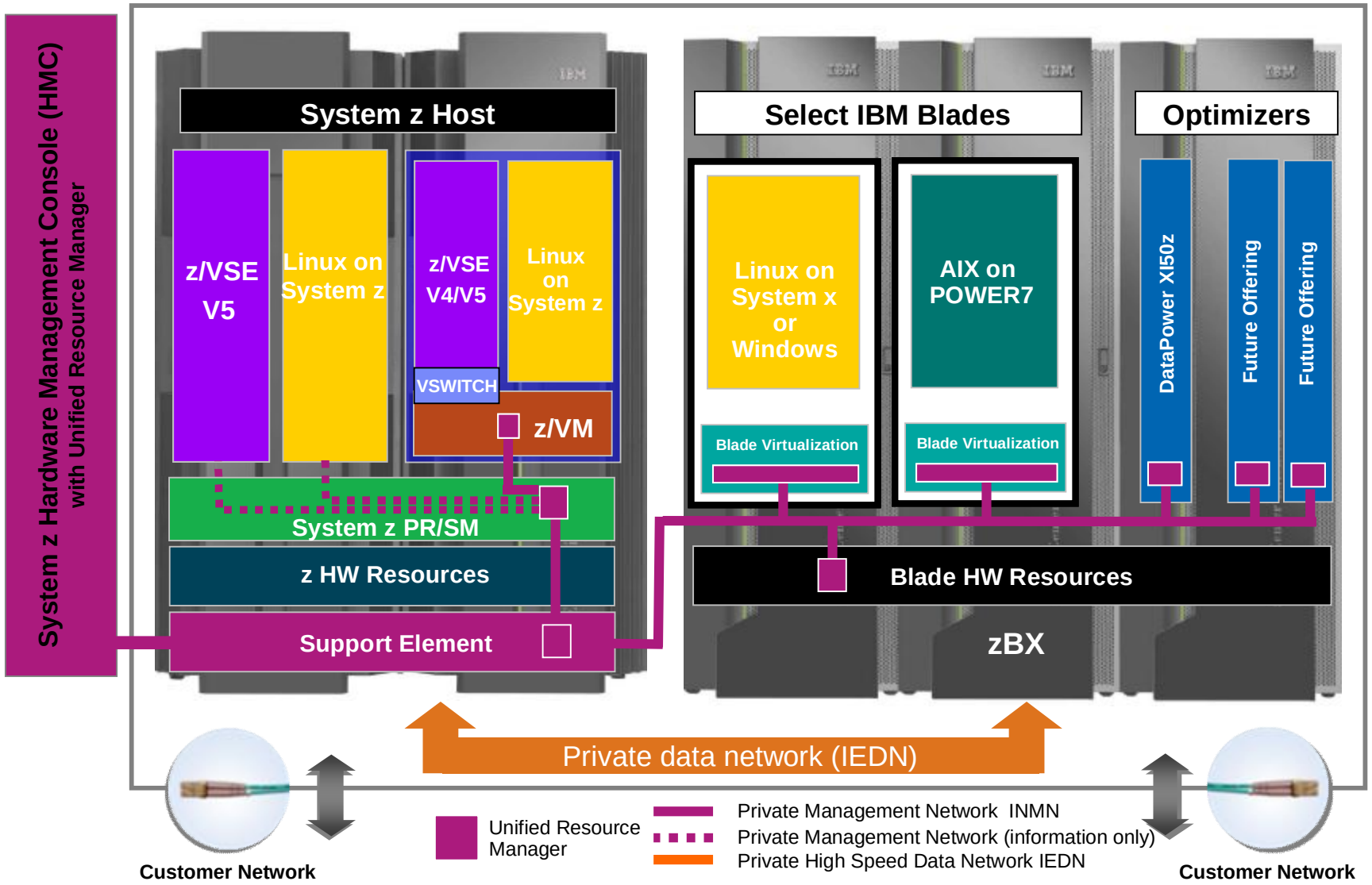


Protect existing z/VSE investments

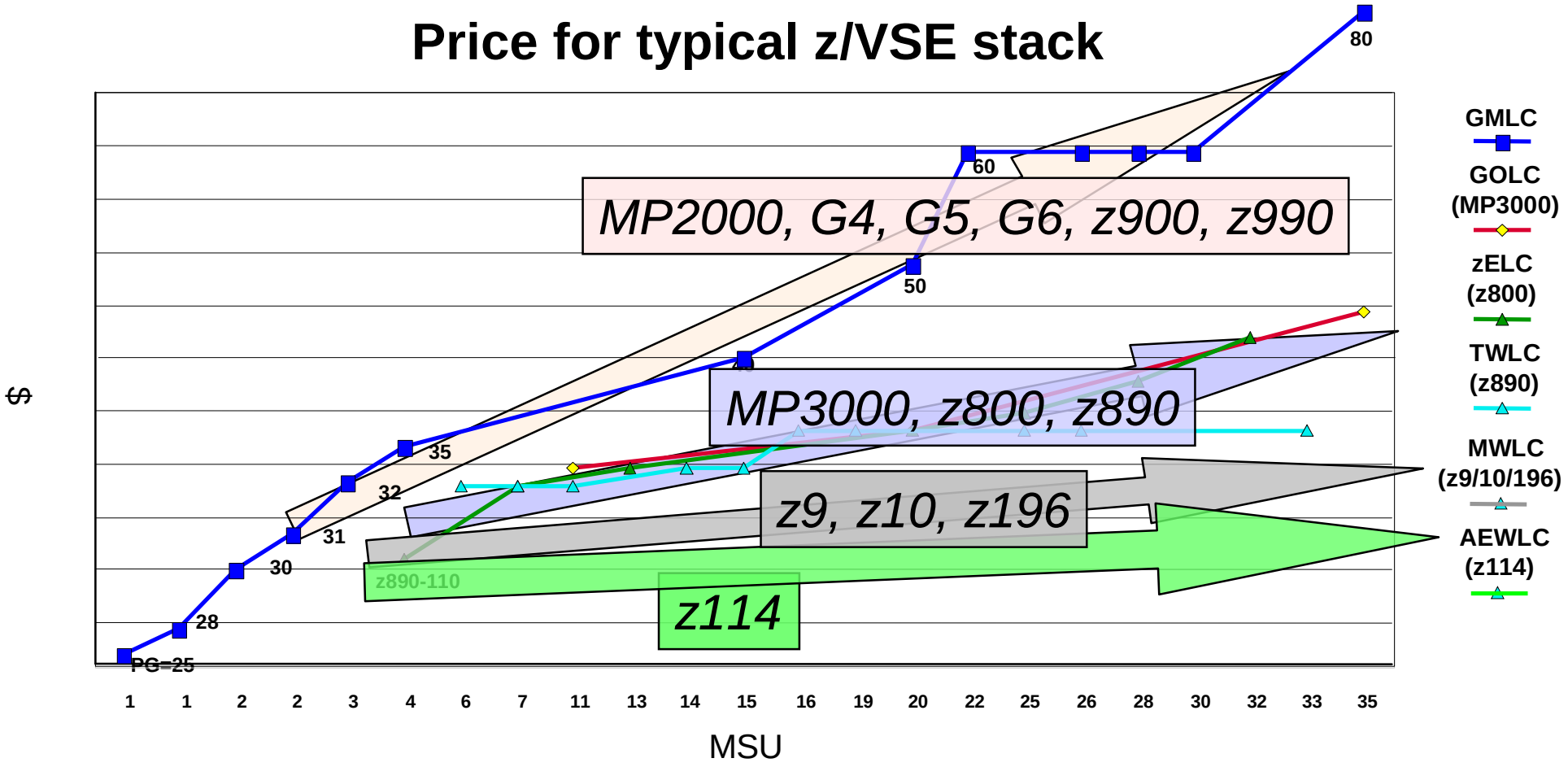
Integrate using middleware and z/VSE connectors

Extend with zBX or with Linux on z to access new applications & solutions

z/VSE Support for IBM zEnterprise - IEDN to zBX



AEWLC – Advanced Entry Workload License Charge on z114



z/VSE V5.1 - General Availability planned for 11/25/2011

SoD 10/05/2010, previewed 04/12/2011, full announcement 10/12/2011

Black = previewed

Blue = added w/ full announce

§ **64-bit virtual addressing for growing / future workloads**
- Keep 'more data in memory' to benefit from increased processor storage
- Built upon 64-bit real addressing, compatible API with z/OS

§ **Introduction of an Architectural Level Set (ALS) that requires System z9 (or later)**
- z/VSE V5 will run on System z9 BC/EC, z10 EC/BC, and zEnterprise z196/z114

§ **IBM zEnterprise exploitation**
- Support Static Power Save Mode for MWLC clients with subcapacity option on z196
- 4096-bit RSA keys with Crypto Express3 for enhanced security
- Support of OSA-Express for zBX (CHPID OSX) to participate in an Intra Ensemble Data Network (IEDN)
- z/VSE z/VM IP Assist (VIA)

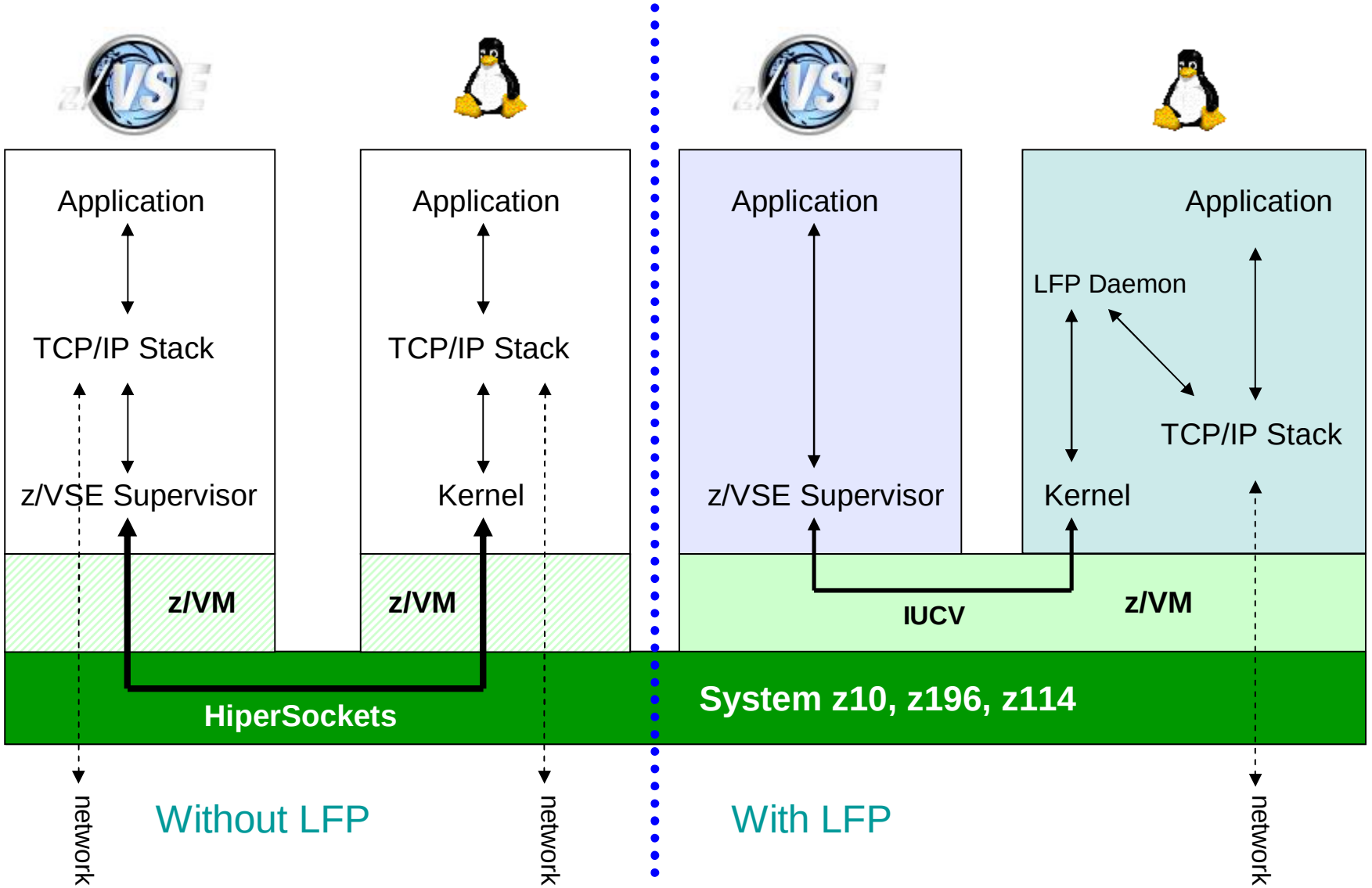
§ **Exploitation of IBM System Storage options**
- Copy Export function of TS7700 Virtualization Engine for disaster recovery
- IBM Storwize V7000 Midrange Disk System

§ **Networking enhancements**
- IPv6 support added to Linux Fast Path connector
- GDPS client for high availability in z/VSE

§ **Statement of Direction**
- CICS Explorer capabilities for CICS TS for VSE/ESA to deliver additional value
- Allow the Linux Fast Path function to be used in an LPAR environment

Linux Fast Path in a z/VM-mode LPAR - Supported by z/VSE V4.3 + V5.1

Faster communication between z/VSE and Linux applications under z/VM



Press

zJournal: April/May 2011

Clipper Group: Sep 2011

The z/VSE Fast Path to Linux on System z

Print this article

TRANSLATE

< Previous Page 1 2 3 4 Next Page >

by Ingo Franzki, Karsten Graul

April 6, 2011

Linux on System z has been an important part of z/VSE's Protect, Integrate and Extend (PIE) strategy for many years. It:

- Protects customers' enormous cumulative investment in their core z/VSE applications
- Integrates z/VSE systems and applications into a heterogeneous IT environment
- Extends z/VSE's capabilities with features and functions provided by Linux on System z or other platforms.

Linux on System z provides many useful functions that z/VSE doesn't provide. It offers WebSphere, Java, DB2 Universal Database, a rich set of development tools, and a growing selection of packaged applications. On the other hand, z/VSE provides excellent, cost-effective capabilities to run traditional workloads such as CICS transactions or batch jobs.

To allow easy integration of z/VSE with other systems and applications, z/VSE provides a huge set of so-called connectors that allow access to various types of z/VSE data and applications from remote applications

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IBM Continues Extension of z/VSE — More Function for Midrange Mainframe Users

Analyst: Stephen D. Bartlett

Management Summary

Long, long ago in a land far, far away, and way before the *Web-year* became the standard unit of time in the IT industry (actually it was in Washington, D.C., in the mid 1960's), there was a young sales rep who worked for a very large, prestigious computer company. In that young sales rep's briefcase were two binders, fairly thick, but manageable: one contained detailed descriptions and important elements of all the hardware products that his company sold and similarly the other contained all the company's software. For the most part, those binders contained all the building blocks required for almost any enterprise, public or private, to create, operate, and maintain an extensive information system to support their diverse missions. That is not to say that there weren't at least seven other companies whose sales reps could make the same claim as our young rep, but the other vendors' solutions were not as durable, as history demonstrated.

Fast forward, if you will, to the present. That large, prestigious company remains, but that company's products and services are far, far larger than whose descriptions could be contained within a few binders. Moreover, this company is surrounded, and we also would have to say intermeshed and interconnected, with numerous other vendors that now constitute this industry, one that seems to be expanding and being redefined almost exponentially. In the early 1950s, the most common unit of computer input and data storage was a hole in a paper card 7-3/8 by 3-1/4 inches (approx. 187.3 by 82.6 mm); now it is most often a digital stream that flows between end points located almost anywhere in the world and transmitted through or stored in a cloud of immeasurable dimensions. Every facet of our lives is influenced or touched by this phenomenon; one could argue that our modern culture could not exist without it. The constructs of the IT universe are manifold and their taxonomy is large and dynamic. However, not a week goes by in which some player in this mash up does not declare to have invented something new.

Thus, is there any wonder that something can easily get lost in the morass of information that surrounds this industry, even within the more limited universe of the IBM Corporation? For instance, let's stipulate that computer operating systems are a fairly erudite subject, but nevertheless an absolutely essential element of the IT universe and, as it turns out, one can count the developers and distributors of such on your two hands. (Let's not split hairs by arguing for the mega-multiple authorship of Linux.) Let's just count those that officially run on IBM server families. There is *AIX* and *IBM i* on *Power Systems*, *Linux* (from various distributors) on each family, Microsoft *Windows* on *System x* servers, and *z/OS*, *z/VM*, *z/TPF*, and *z/VSE* on System z. It would be no surprise if z/VSE is only vaguely familiar; it seems to have become the stepchild, but not a homely one, lost in the hyper-universe dominated by z/OS and Linux on zEnterprise systems. This seems to have become a dilemma for not only IBM but for its loyal z/VSE customers as well, but should they be concerned? We think not, but if you want to know why, then please read on.

IN THIS ISSUE

- The Importance of z/VSE in the Mainframe Arena 2
- What z/VSE Can Do For You Now – and What It Can't 2
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One Forest Green Road • Rye, New Hampshire 03870 • U.S.A. • 781-235-0085 • 781-235-5454 FAX
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New SoD: Linux Fast Path in an LPAR Environment

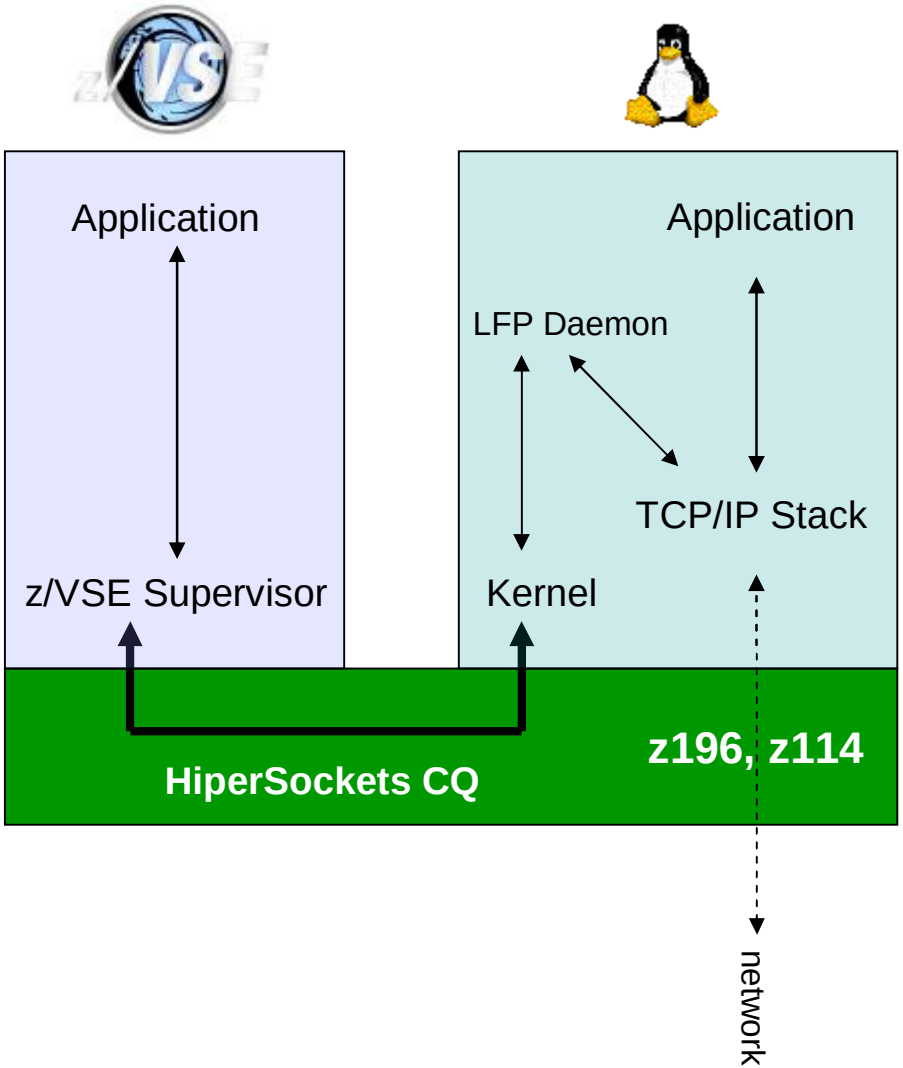
No z/VM is needed to utilize the LFP advantage

Statement of Direction:

Linux Fast Path in LPAR environment:

IBM intends to provide the Linux Fast Path function for LPAR environments Exploiting the zEnterprise HiperSockets Completion Queue.

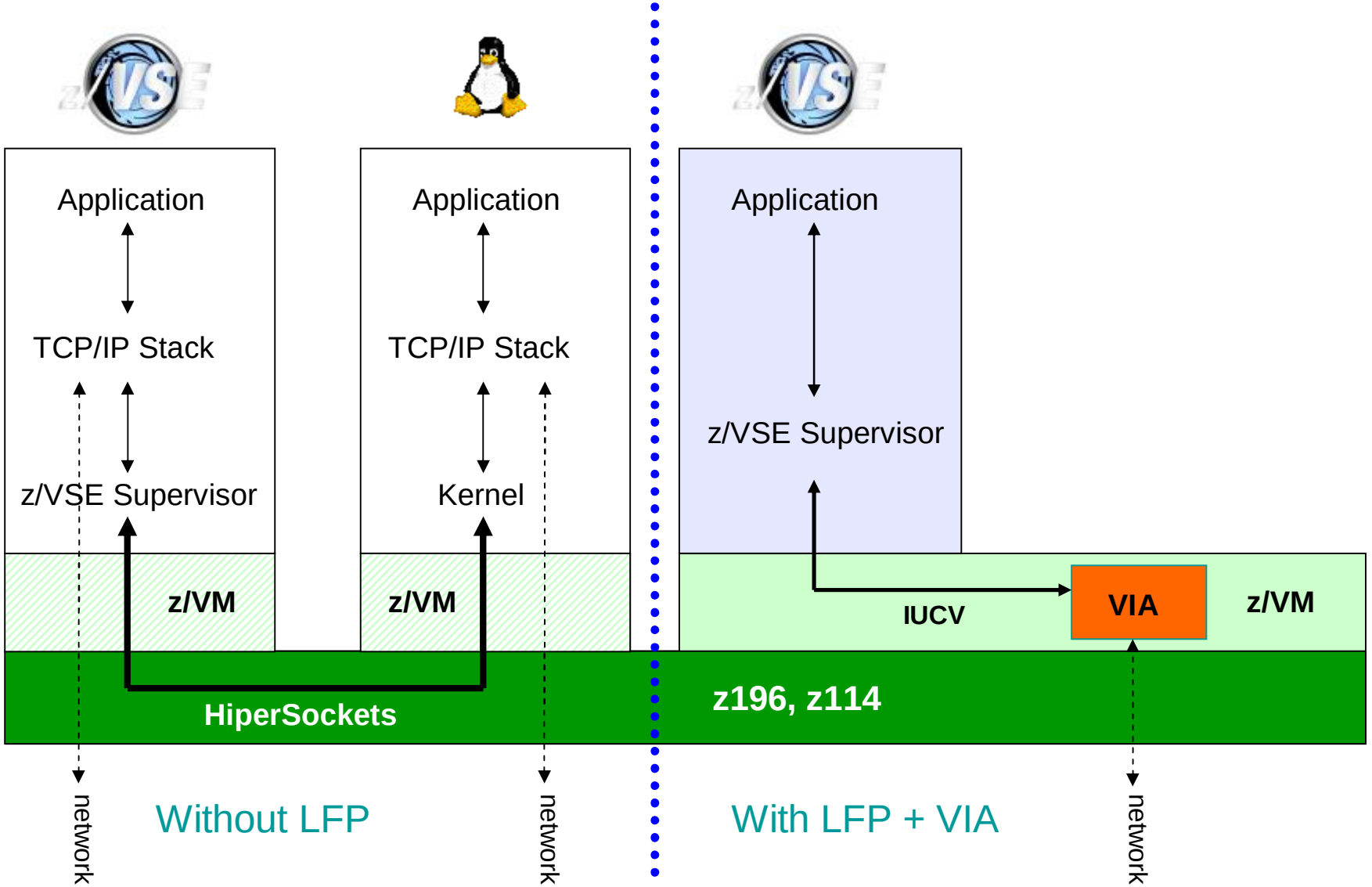
For more information see the statement of direction In Hardware Announcement 111-136, (RFA54680) dated July 12, 2011.



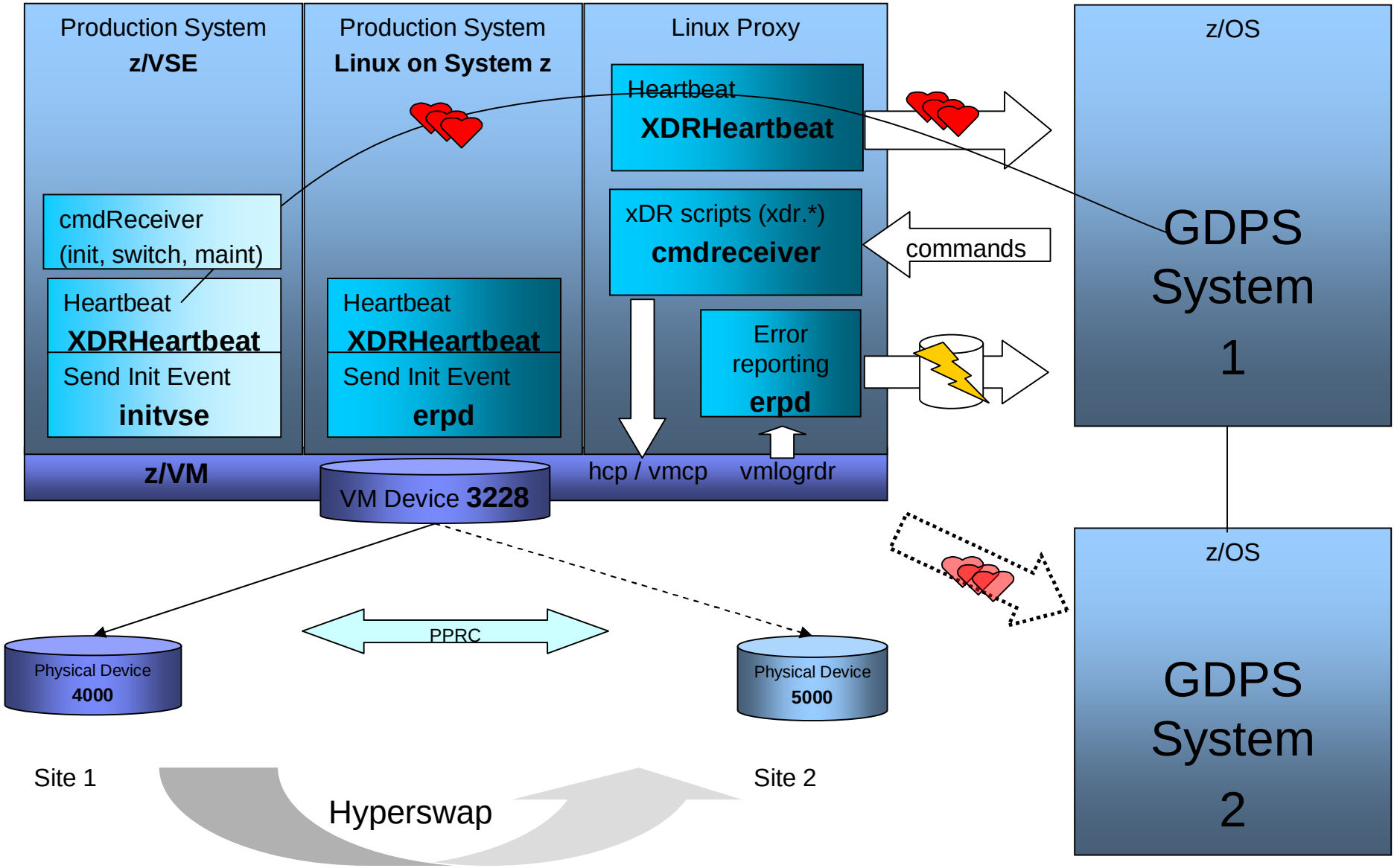
Note: All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

z/VSE z/VM IP Assist (VIA) - Supported by z/VSE V5.1

No Linux on System z is needed to utilize the LFP advantage



xDR Support for z/VSE as Active Guest under z/VM



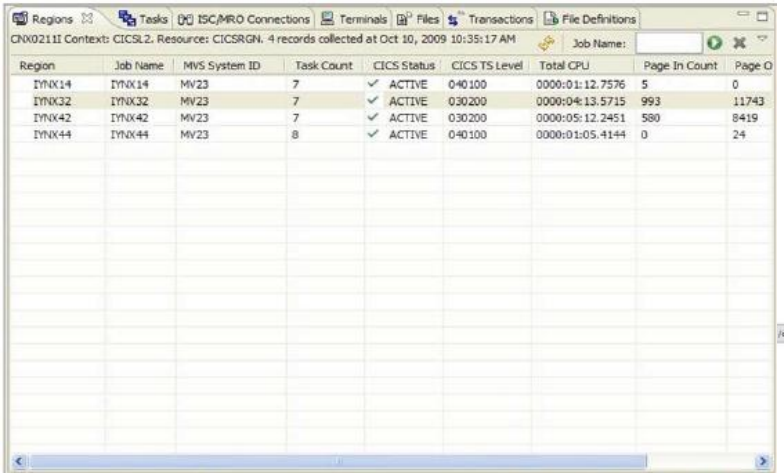
SoD: CICS Explorer Functionality for CICS TS for VSE/ESA

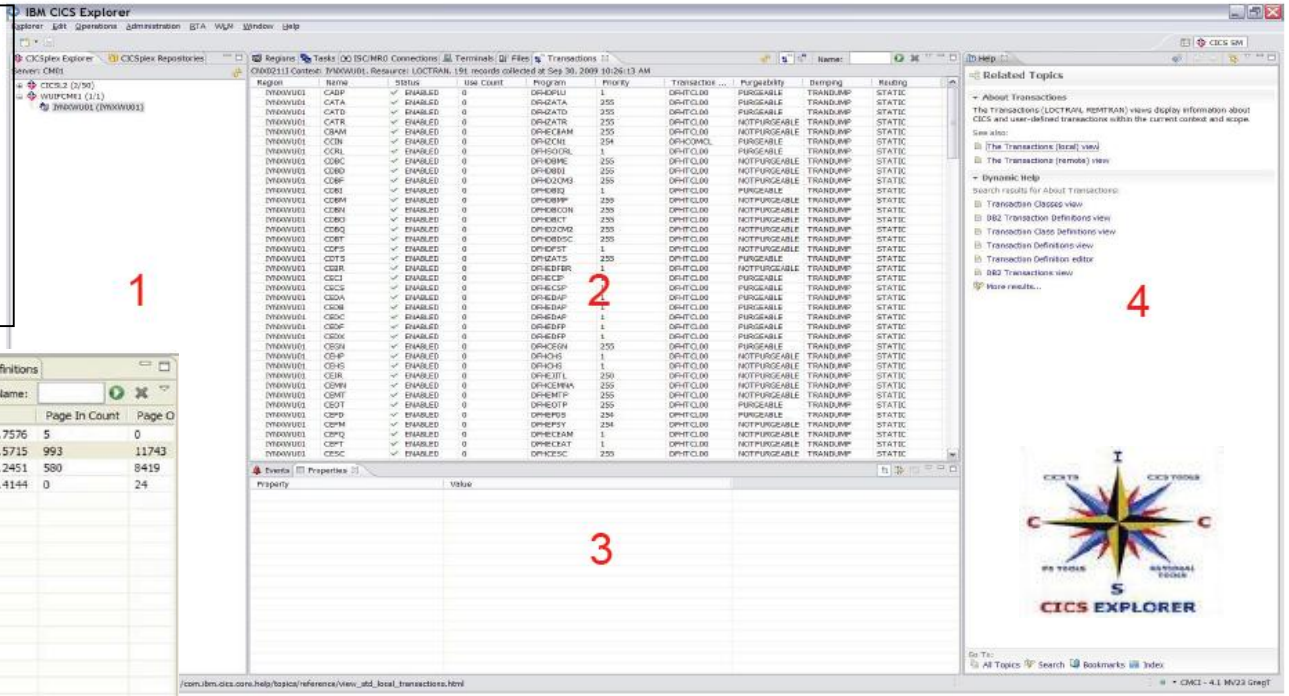
Statement of Direction:

"IBM intends to provide CICS Explorer capabilities for CICS TS for VSE/ESA, to deliver additional value."

CICS Explorer

- Based on the Eclipse Rich Client Platform (RCP)
- Provides integration platform
- Scalable and intuitive way to monitor CICS systems
- Can be extended via plug-ins





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Agenda

- **IBM zEnterprise System**
- **z/VM**
- **Linux on System z**
- **z/VSE**
- **Summary**

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Original URL: http://www.theregister.co.uk/2011/10/17/ibm_mainframe_os_enhancements/

IBM big iron OSes treated to spit and polish

Windows on zBX, clustered z/VM, and virtual z/VSE

By Timothy Prickett Morgan

Posted in Virtualization, 17th October 2011 16:03 GMT

z/VM gets clustering and live migration

Speaking of z/VM, Big Blue is previewing the V6.2 release of that mainframe operating system/hypervisor, which will start shipping on December 2. z/VM is, of course, the virtualization layer that underpins the Linux operating system on Sy mainframes.

The next new feature with z/VM V6.2 is called z/VM Single System Image Cluster (or VMSSI for short), and as the name suggests, it allows up to four z/VM-based mainframes to be coupled very tightly into a shared memory system. This is what Virtual Iron (now part of Oracle) was trying to do for Linux boxes back in the early 2000s and that ScaleMP and RNA Networks (now part of Dell) currently do in one fashion or another. The linking up of four separate z/VM hypervisors o distinct System z mainframes allows for these four machines to look like a single shared memory system to the operating systems and applications that ride on top of z/VM. It also allows for the live migration of running Linux partitions arour VMSSI cluster – something that z/VM has needed to compete with x86-based hypervisors that have been able to do this for years now.

Let's get virtual, virtual

IBM is also previewing the next release of its VSE mainframe operating system, z/VSE V5.1. While MVS, OS/390, and z/OS are the high end mainframe operating systems for big iron beasts running WebSphere middleware, Java and C/C applications, and DB2 databases as well as offering a Unix runtime environment, VSE has in recent years been popular on smaller machines running the CICS transaction monitor and DB2 database.

The big new thing with z/VSE V5.1 is 64-bit virtual addressing, which is an upgrade from the 64-bit "real" addressing that came out with z/VSE V4.1. Way back in the dawn of time, System/370 mainframes had 24-bit memory, which gave y 16MB address space. With the System/370-XA machines, IBM boosted it up to 31 bit addressing, giving you 2GB of memory. Programs written for 24 bit modes could run on 31 bit systems.

In 2000, with the zSeries line, IBM moved to 64-bit physical addressing, allowing in theory for a mainframe to address up to 16 exabytes (a little more than a million terabytes) of memory. Generally speaking, the virtual addressing above the limit is used for application and data, not the operating system. Anyway, virtual addressing with prior z/VSE releases was still 31-bit, and now it is 64-bit, which means mainframe shops don't have to bend over backwards with data spaces hacked algorithms to manage the use of the memory above the 2GB limit. Now, that upper memory is accessible virtually, just like it is in z/OS.

Tom Rosamilia

IBM General Manager, Power and z Systems

“For the past four decades, z/VSE has been an important part of our portfolio. [...] z/VSE is designed to help you protect your existing investment in applications and data. And IBM remains committed to address the requirements for growing z/VSE workloads.“

“We are also committed to expand the options available for deploying Linux workloads. These implementations can drive significant financial benefits.“

“Recent z/VM enhancements also strengthen System z virtualization technology. The goal is to enable you to take advantage of the new function, performance, reliability, availability, and serviceability improvements of the IBM zEnterprise System, including hybrid system environments.“

Questions ?