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

4th European GSE / IBM Technical University, Munich, Germany, October 2010

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| DFSORT | HyperSwap | System z | z/VM* |
| DFSMS | IBM* | System z9 | z/VSE |
| DS6000 | IBM eServer | System z10 | zSeries* |
| DS8000 | IBM logo* | System z10 Business Class | z9 |
| Enterprise Storage Server* | IMS | Tivoli | z10 |
| ESCON* | MQSeries* | TotalStorage* | z10 BC |
| FICON* | OMEGAMON* | VSE/ESA | z10 EC |

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# Agenda

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

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# IBM System z family

## IBM System z10 EC (2097)

- Announce 2/2008 – Server w/ up to 77 cores
- 5 models – Up to 64-way
- Granular Offerings for up to 12 CPs
- PU (Engine) Characterization
  - CP, SAP, IFL, ICF, zAAP, zIIP
- On Demand Capabilities
  - CoD, CIU, CBU, On/Off CoD, CPE
- Memory – up to 1.5 TB for Server and up to 1 TB per LPAR
  - 16 GB Fixed HSA
- Channels
  - Four LCSSs
  - 2 Subchannel Sets
  - MIDAW facility
  - 63.75 subchannels
  - Up to 1024 ESCON® channels
  - Up to 336 FICON® channels
  - FICON Express2, 4 and 8
  - zHPF
  - OSA 10 GbE, GbE, 1000BASE-T
  - InfiniBand® Coupling Links
- Configurable Crypto Express3
- Parallel Sysplex clustering
- HiperSockets™ – up to 16
- Up to 60 logical partitions
- Enhanced Availability
- Operating Systems
  - z/OS, z/VM, z/VSE™, TPF, z/TPF, Linux on System z

## IBM System z10 BC (2098)

- Announced 10/2008 – Server w/ 12 cores
- Single model – Up to 5-way 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
  - Two LCSSs
  - 2 Subchannel Sets
  - MIDAW facility
  - 63.75 subchannels
  - Up to 480 ESCON channels
  - Up to 128 FICON channels
  - FICON Express2, 4 and 8
  - zHPF
  - OSA 10 GbE, GbE, 1000BASE-T
  - InfiniBand Coupling Links
- Configurable Crypto Express3
- Parallel Sysplex clustering
- HiperSockets – up to 16
- Up to 30 logical partitions
- Enhanced Availability
- Operating Systems
  - z/OS, z/OS.e, z/VM, z/VSE, TPF, z/TPF, Linux on System z

## IBM zEnterprise 196 (2817)

- Announce 7/2010 – Server w/ up to 96 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
  - Four LCSSs
  - 3 Subchannel Sets
  - MIDAW facility
  - 63.75 subchannels
  - Up to 240 ESCON channels
  - Up to 336 FICON channels
  - FICON Express4 and 8
  - 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)

- Announce 7/2010
- zBX Racks with:
  - BladeCenter Chassis
  - N + 1 components
  - Blades
  - Top of Rack Switches
  - 8 Gb FC Switches
  - Power Units
  - Advance Management Modules
- 0 to 112 Blades
  - IBM Smart Analytics Optimizer Solution
  - POWER7 Blades
  - System x Blades*
  - WebSphere DataPower Appliance*

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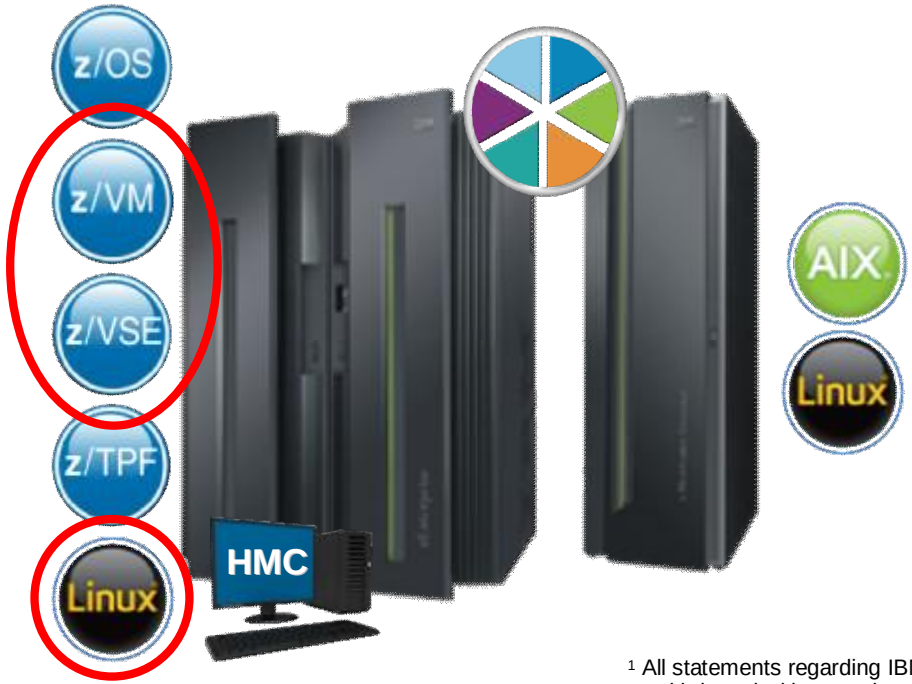
# IBM zEnterprise System - Best in Class Systems and Software Technologies: *A system of systems that unifies IT for predictable service delivery*

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 (z196)**

- 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, over 50 Billion Instructions per Second (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® and Linux 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.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# Agenda

- **IBM zEnterprise System**
- **z/VSE**
  - **z/VSE Roadmap**
  - **z/VSE Support for z196**
  - **z/VSE V4.3**
  - **z/VSE Statement of Direction**
- **z/VM**
- **Linux on System z**

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# z/VSE Evolution

**z/VSE V4.3 Nov 26, 2010**
- **Preview announce Oct 20, 2009**
- **Update with z196 announcement**
- **Full product announce Oct 5, 2010**

**z/VSE V4.2.2 April 30, 2010**
- **Crypto Express3**
- **IPv6/VSE* (May 28, 2010)**

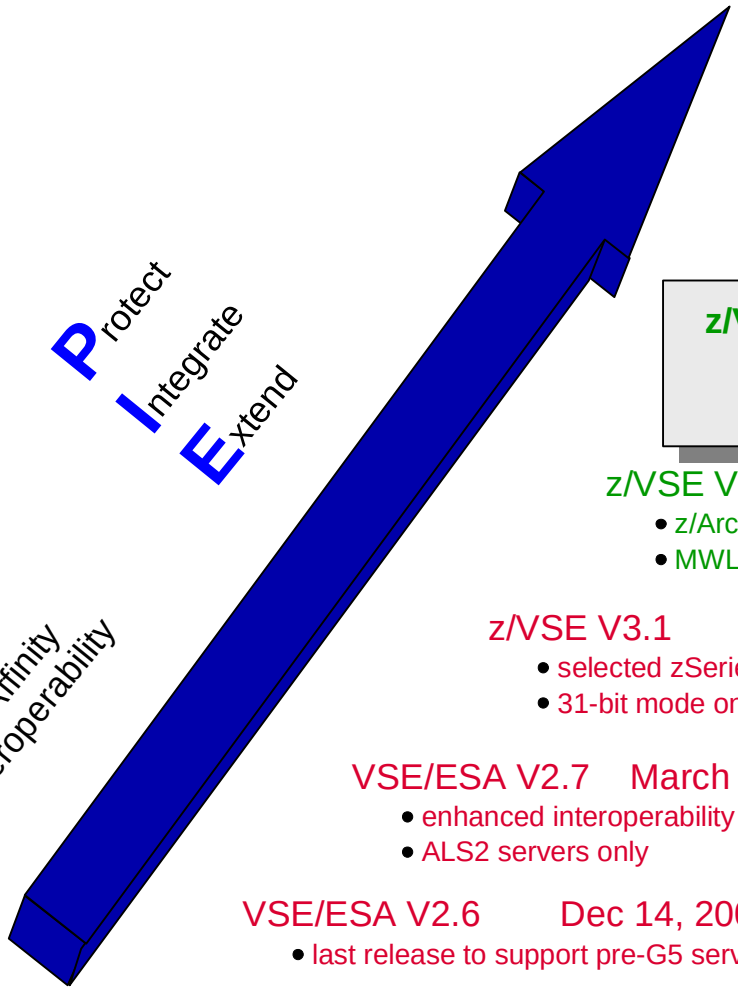
**z/VSE V4.2 Oct 17, 2008**
- **More tasks, PAV, LDAP Client, SVC**
- **SoD for CICS/VSE, EGL, WMQ**

z/VSE V4.1 March 16, 2007
- z/Architecture only / 64-bit real addr
- 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




* IPv6/VSE is a registered trademark of Barnard Software, Inc.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# z/VSE Support Status

| VSE Version and Release | Marketed | Supported | End of Support |
|---|---|---|---|
| z/VSE V4.2[2] | Yes | Yes | tbd |
| z/VSE V4.1[2] | No | Yes | 04/30/2011 |
| z/VSE V3.1[1] | No | No | 07/31/2009 |
| VSE/ESA V2.7 | No | No | 02/28/2007 |

[1]) z/VSE v3. 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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# z/VSE Support for IBM Mainframe Servers

| *IBM Servers* | **z/VSE V4.3 Plan** | **z/VSE V4.2** | z/VSE V4.1 |
|---|---|---|---|
| **IBM zEnterprise 196** | **Yes** | **Yes** | Yes |
| **IBM System z10 EC & z10 BC** | **Yes** | **Yes** | Yes |
| **IBM System z9 EC & z9 BC** | **Yes** | **Yes** | Yes |
| IBM eServer zSeries 990 & 890 | Yes | Yes | Yes |
| IBM eServer zSeries 900 & 800 | Yes | Yes | Yes |

**Reminder:**

- **z/VM V6 requires System z10 technology (or higher)**
- **Novell SLES 11 requires System z9 technology (or higher)**


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# z/VSE Support for IBM zEnterprise 196

## § z196 compatibility support

- z/VSE V4.1, V4.2, and z/VSE V4.3 (GA 4Q2010) support z196 since GA on 9/10/2010
  - Refer to the z/VSE subsets of the 2817DEVICE Preventive Service Planning (PSP) bucket
  - z/VSE PTFs are required for MWLC Subcapacity pricing customers
- Crypto Express3 requires z/VSE V4.2 as a minimum level

## § z196 exploitation

- Static power save mode for use with SCRT
- Up to 32 HiperSockets
- With z/VSE V4.3:
  - 1 MB frames for data spaces
  - Dynamic add of CPs
  - Crypto AP interrupts
  - Fast Path to Linux on System z in a z/VM-mode LPAR

## § zBX environment

- z/VSE V4 can participate in a data network using z/VM's VSWITCH support

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# z/VSE V4.3 - GA planned for 11/26/2010

*Previewed 10/20/2009, refreshed 07/22/2010, full announce 10/05/2010*

Black = previewed

Blue = newly announced

- **IBM zEnterprise and System z10 technology exploitation**
  - Dynamic add of logical CPs to LPAR without Re-IPL
  - Large page (1 megabyte page) support for data spaces
  - FICON Express8 and Crypto Express3 support
  - LFP connector: Fast path from z/VSE to Linux TCP/IP in a z/VM-mode LPAR
- **Virtual storage constraint relief for workload growth**
  - Move selected system programs and buffers from 24-bit into 31-bit storage
- **Ease of use through four-digit device addresses**
  - Transparent for system, vendor, and user applications that rely on 3-digit CUUs
- **Enhanced storage options**
  - DS8000 Remote Mirror and Copy (RMC) feature support through ICKDSF
  - IBM System Storage TS7700 WORM support
  - XIV support (via PTF on top of z/VSE V4.3)
- **Networking, security, and auditability enhancements**
  - SNMP agent to retrieve z/VSE specific system and performance data
- **DOS/VS RPG II support for CICS Transaction Server (CICS TS)**
  - Allows RPG programs implemented for CICS/VSE V2.3 to run with CICS TS V1.1
- **IPv6/VSE as optional product (IPv6 solution)**
  - IBM IPv6/VSE – licensed from BSI – includes IP stack & applications for both, IPv6 and IPv4


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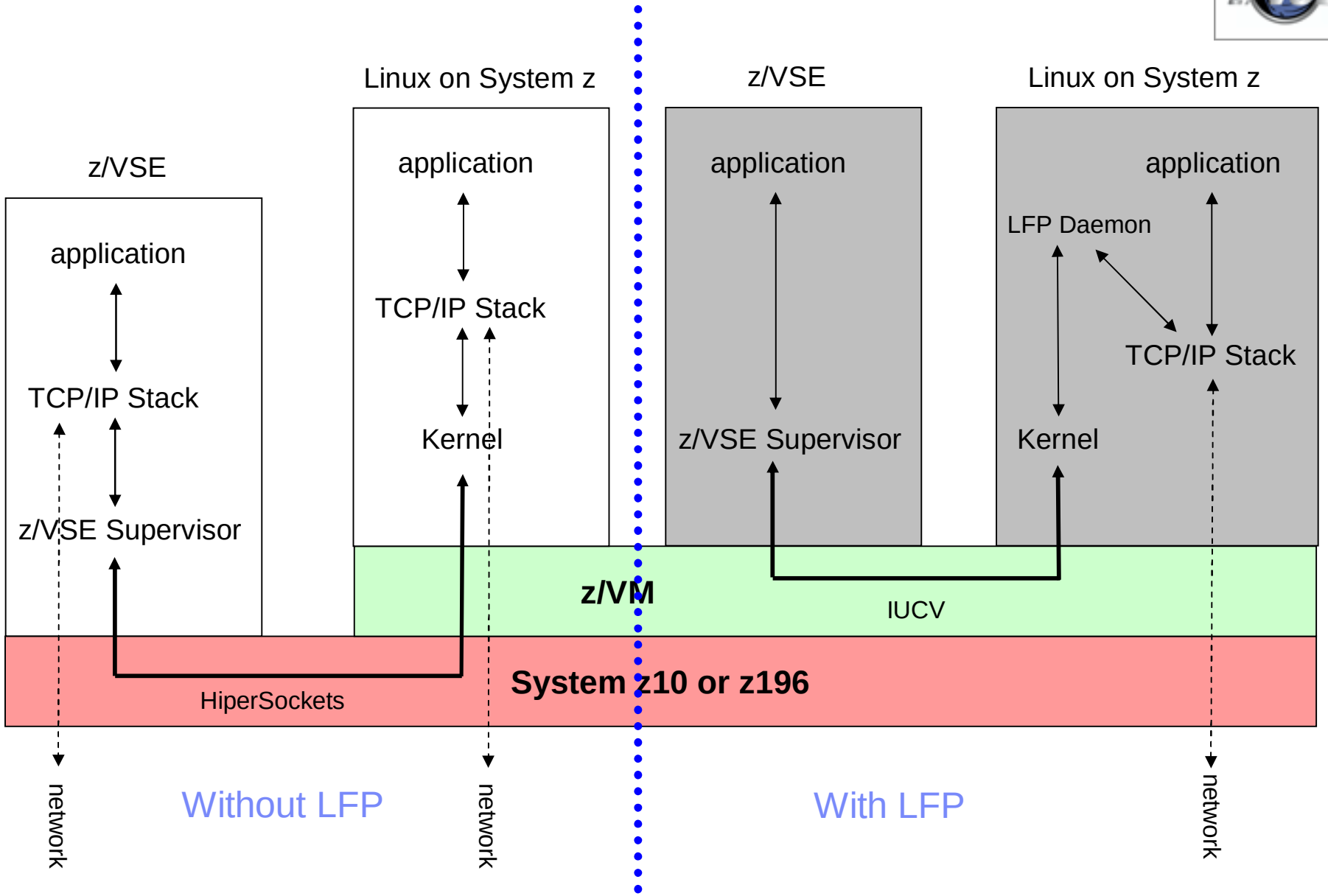
# z/VSE V4.3: Linux Fast Path (LFP)





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# XIV Support with Linux on System z, z/VM V5.4 and V6.1, and z/VSE V4.3

Native z/VM support for XIV (e.g., paging, spooling) is available now via service for z/VM V5.4 and V6.1 (APAR VM64708).

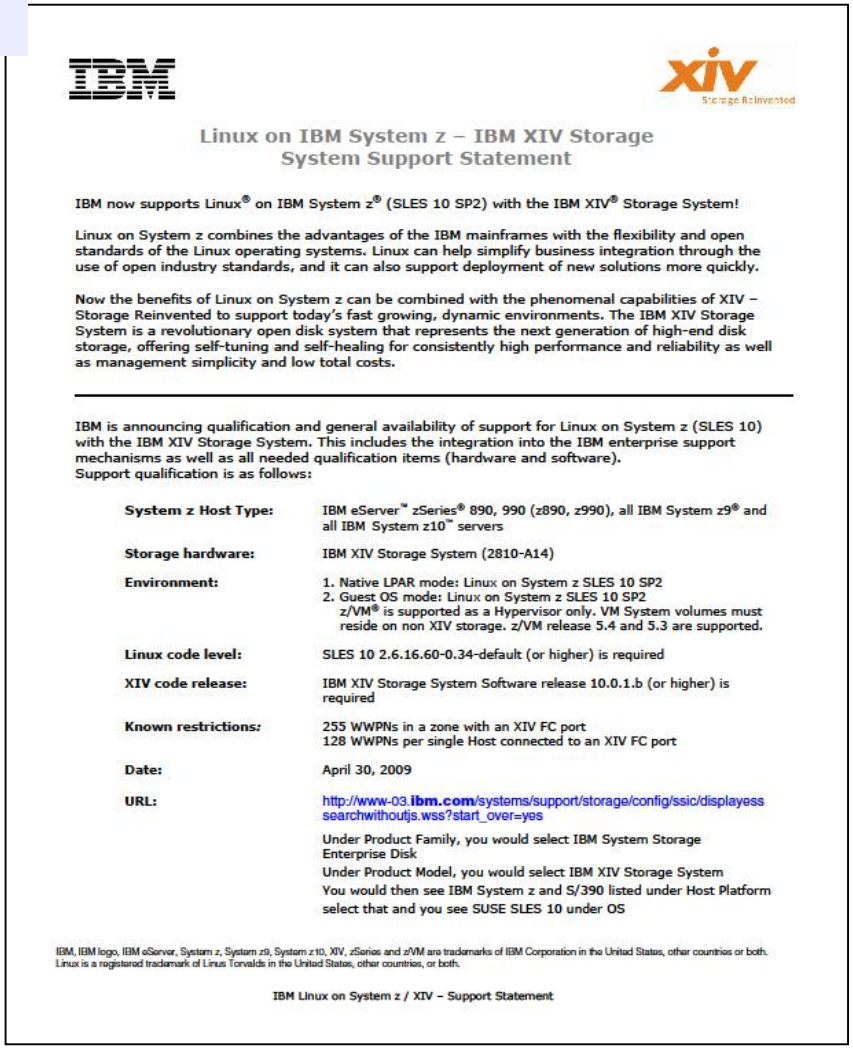
Added z/VM Support
*Aug 25, 2010*

April 30, 2009

**IBM is announcing qualification and general availability of support for Linux on System z (SLES 10) with the IBM XIV Storage System.**

- IBM eServer™ zSeries® 890, 990 (z890, z990), all IBM System z9® and all IBM System z10™ servers
- IBM XIV Storage System (2810-A14)
- Environment:
  - Native LPAR mode: Linux on System z SLES 10 SP2
  - Guest OS mode: Linux on System z SLES 10 SP2 z/VM® is supported as a Hypervisor only. VM System volumes must reside on non XIV storage. z/VM release 5.4 and 5.3 are supported.
- SLES 10 SP2, RHEL 5.2, RHEL 5.3, or RHEL 5.4 is required

Now adding z/VSE Support w/ PTF on top of z/VSE V4.3



Linux on IBM System z – IBM XIV Storage System Support Statement

IBM now supports Linux® on IBM System z® (SLES 10 SP2) with the IBM XIV® Storage System!

Linux on System z combines the advantages of the IBM mainframes with the flexibility and open standards of the Linux operating systems. Linux can help simplify business integration through the use of open industry standards, and it can also support deployment of new solutions more quickly.

Now the benefits of Linux on System z can be combined with the phenomenal capabilities of XIV – Storage Reinvented to support today's fast growing, dynamic environments. The IBM XIV Storage System is a revolutionary open disk system that represents the next generation of high-end disk storage, offering self-tuning and self-healing for consistently high performance and reliability as well as management simplicity and low total costs.

IBM is announcing qualification and general availability of support for Linux on System z (SLES 10) with the IBM XIV Storage System. This includes the integration into the IBM enterprise support mechanisms as well as all needed qualification items (hardware and software).
Support qualification is as follows:

| | |
|---|---|
| **System z Host Type:** | IBM eServer™ zSeries® 890, 990 (z890, z990), all IBM System z9® and all IBM System z10™ servers |
| **Storage hardware:** | IBM XIV Storage System (2810-A14) |
| **Environment:** | 1. Native LPAR mode: Linux on System z SLES 10 SP2<br>2. Guest OS mode: Linux on System z SLES 10 SP2<br>z/VM® is supported as a Hypervisor only. VM System volumes must reside on non XIV storage. z/VM release 5.4 and 5.3 are supported. |
| **Linux code level:** | SLES 10 2.6.16.60-0.34-default (or higher) is required |
| **XIV code release:** | IBM XIV Storage System Software release 10.0.1.b (or higher) is required |
| **Known restrictions:** | 255 WWPNs in a zone with an XIV FC port<br>128 WWPNs per single Host connected to an XIV FC port |
| **Date:** | April 30, 2009 |
| **URL:** | http://www-03.ibm.com/systems/support/storage/config/ssic/displayessearchwithoutjs.wss?start_over=yes<br>Under Product Family, you would select IBM System Storage Enterprise Disk<br>Under Product Model, you would select IBM XIV Storage System<br>You would then see IBM System z and S/390 listed under Host Platform<br>select that and you see SUSE SLES 10 under OS |

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IBM Linux on System z / XIV – Support Statement


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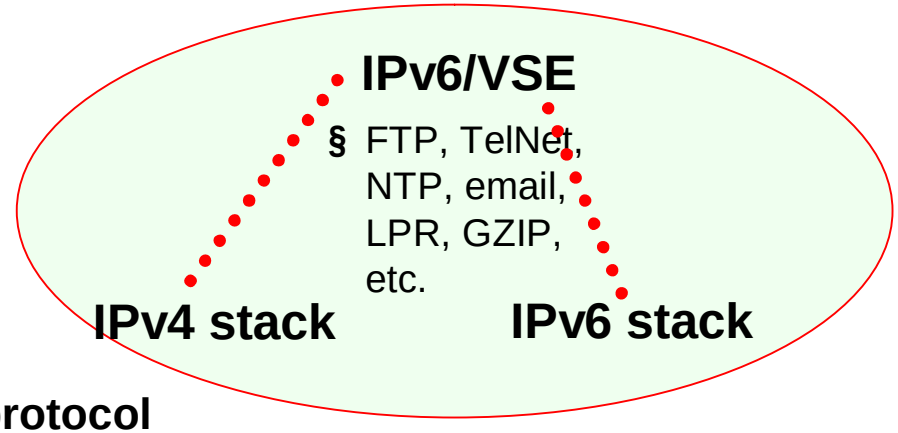
# IBM IPv6/VSE® Version 1 Release 1

## Allow z/VSE users to participate in an IPv6 network

- **New product:** 5686-BS1
- **Announcement:** April 06, 2010
- **General availability:** May 28, 2010
- **Minimum requirement:** z/VSE V4.2 (DY47077)
- **Pricing:** Enabled for sub-capacity pricing

- **IPv6/VSE is designed to provide**
  - TCP/IP stack
  - IPv6-enabled and IPv4-enabled applications
  - IPv6 and IPv4 APIs (IBM's EZA socket APIs)




- **IPv6/VSE supports both, the IPv6 and IPv4 protocol**
  - Both TCP/IP stacks can be run concurrently within one z/VSE system
  - Existing IPv4 applications continue to run unchanged

Note: IPv6/VSE is a registered trademark of Barnard Software, Inc.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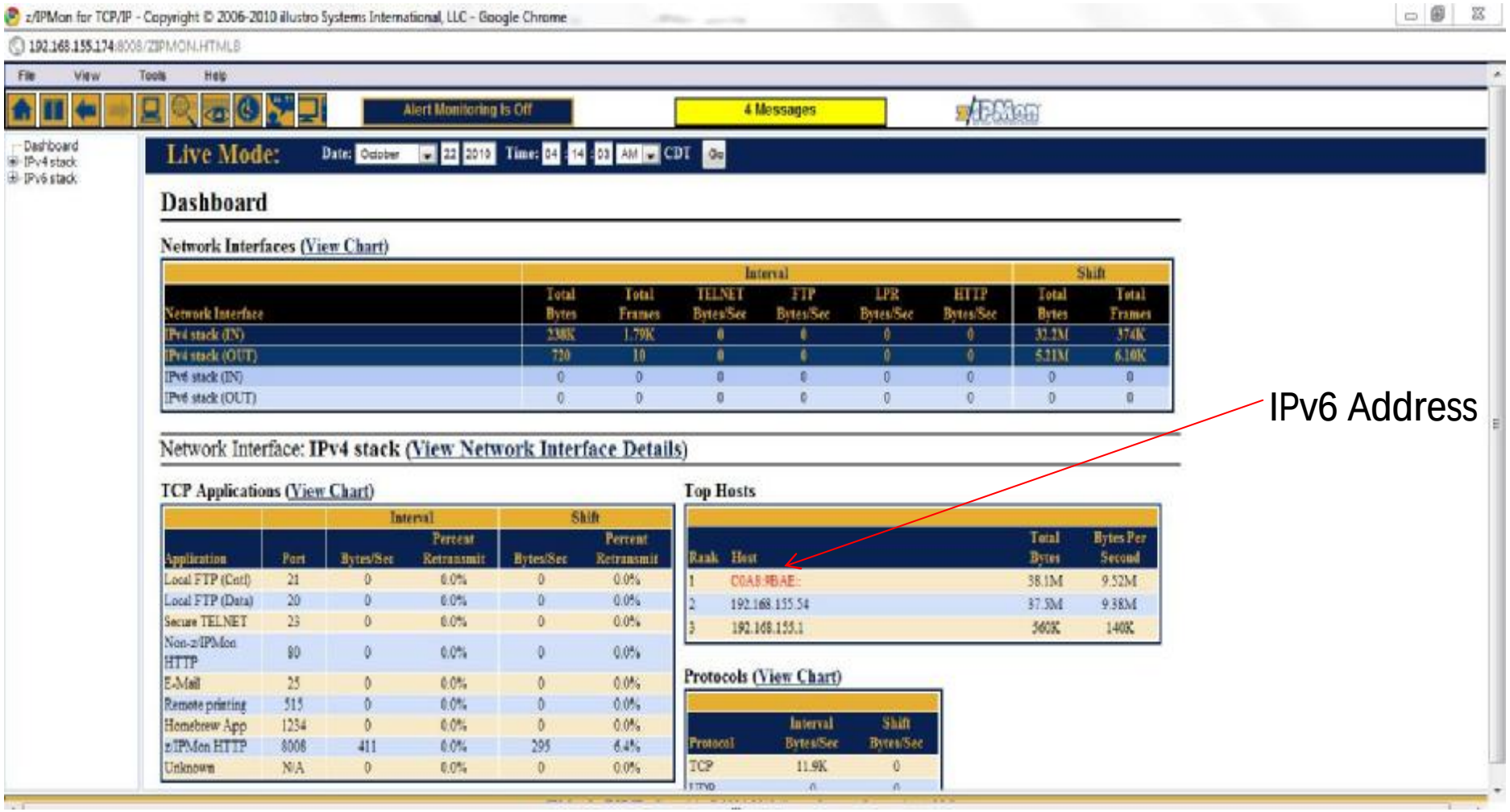
# IPv6 Support



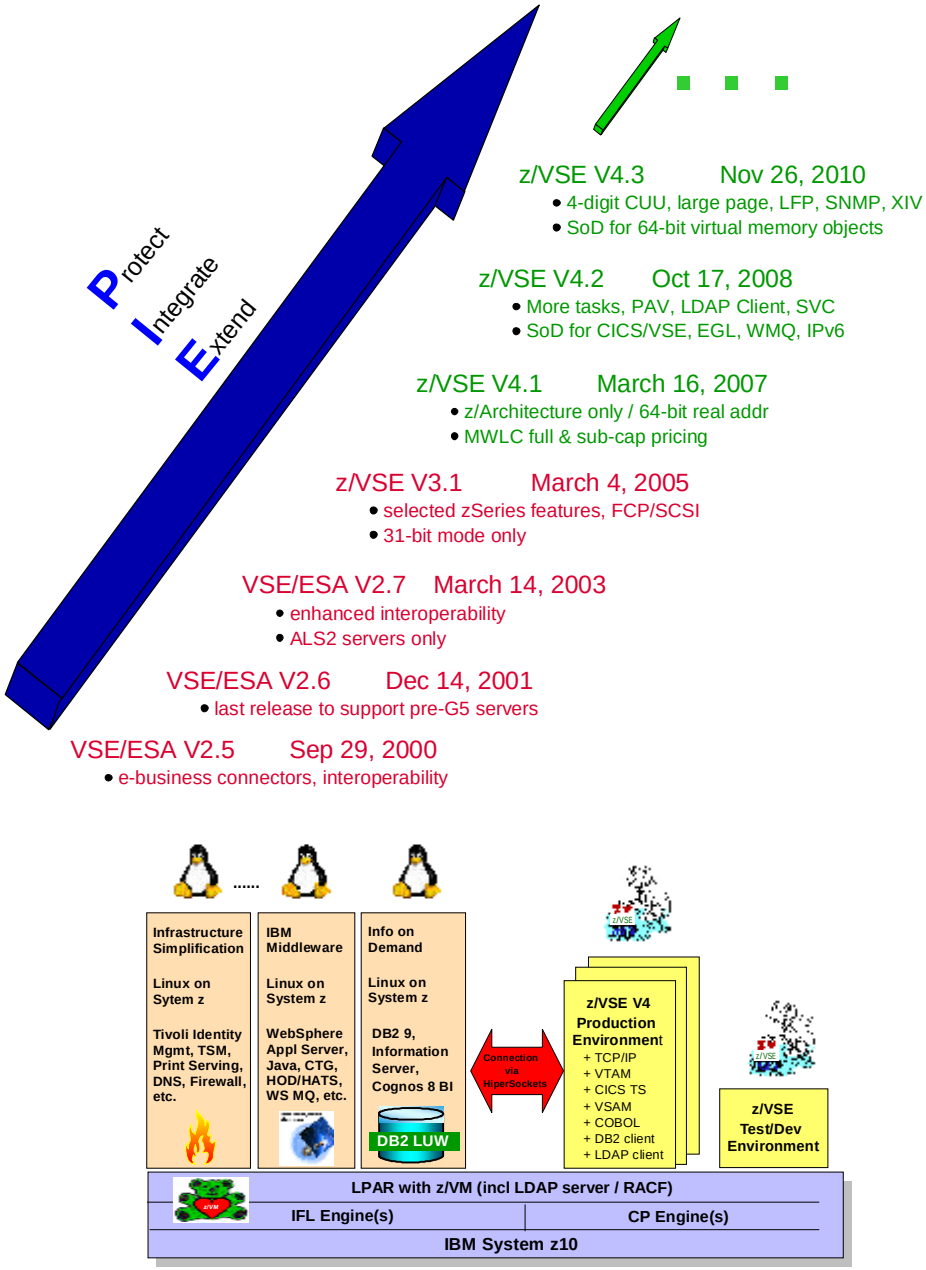
# z/VSE V4.3
## *New Statement of Direction*

**Statement of direction:**

z/VSE intends to provide 64-bit virtual addressing for user applications.

64-bit virtual addressing further exploits the z/Architecture capabilities (64-bit real addressing) introduced with z/VSE 4.1.

z/VSE intends to provide APIs to manage 64-bit virtual memory objects. Memory objects are "chunks" of virtual storage obtained by a program. They may help clients to keep more data in memory for growing workloads and improve performance.

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# Agenda

- **IBM zEnterprise System**
- **z/VSE**
- **z/VM**
  - **z/VM Roadmap**
  - **z/VM Support for z196**
  - **z/VM V6 Statement of Direction**
- **Linux on System z**

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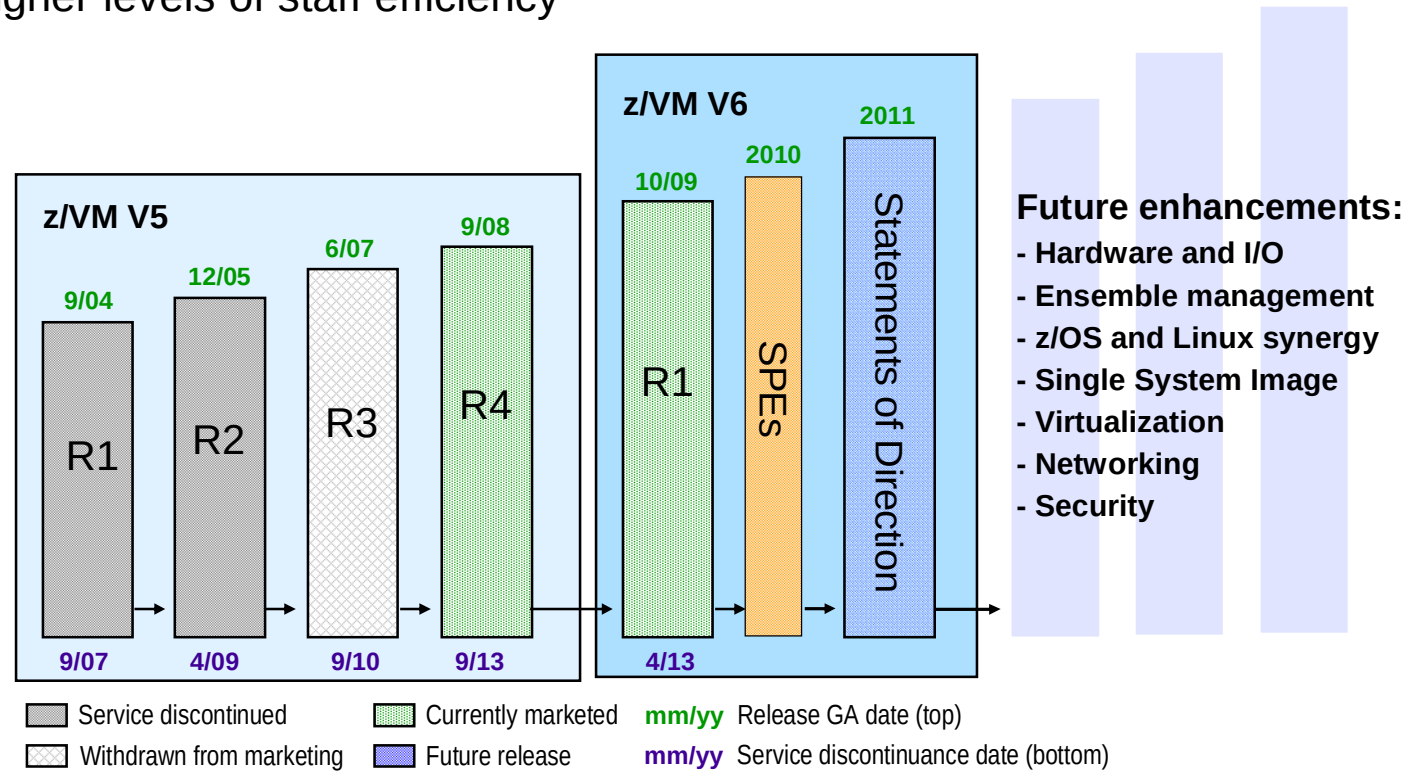
# z/VM Release History

## *z/VM helps clients "do more with less"*

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




IBM has received 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, at Evaluation Assurance Level 4+ (EAL 4+).
While z/VM V5.4 and V6.1 have not been officially evaluated for conformance, they are designed to meet the same standards.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# z/VM Version 5
## *Marketing and Service Update*

- **End of Service for z/VM V5.3 was September 30, 2010**


- **End of Service for z/VM V5.4 has been extended to September 30, 2013**
  - z/VM V5.4 is the last release that supports System z9 servers

- **z/VM V5.4 is still marketed and available**
  - z/VM V5.4 and z/VM V6.1 are available concurrently
  - Clients with System z9 or prior generations should acquire z/VM V5.4

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# z/VM Support for IBM zEnterprise

- **Supported releases:**
  - z/VM 5.4 EoS 12/2013
    - Compatibility only
  - z/VM 6.1 GA 10/23/2009, EoS 4/2013, requires a z10 Architecture Level Set (ALS)
    - Compatibility and exploitation items

- **z/VM 5.3 End of Support was Sept'2010, and therefore does not support z196**

- **Compatibility à z/VM support for host / guests on z196 at the z10 functional level with limited exploitation of new functions (some transparent)**
  - Support available as PTFs concurrently with the Sept'2010 z196 GA
  - Includes PTFs for EREP, IOCP, HCD, HCM, and Performance Toolkit

- **Exploitation support allowing the Unified Resource Manager to provide hypervisor and virtual server management for z/VM**
  - Support available as PTFs concurrently with the Nov'2010 General Availability of zEnterprise BladeCenter Extension (zBX)


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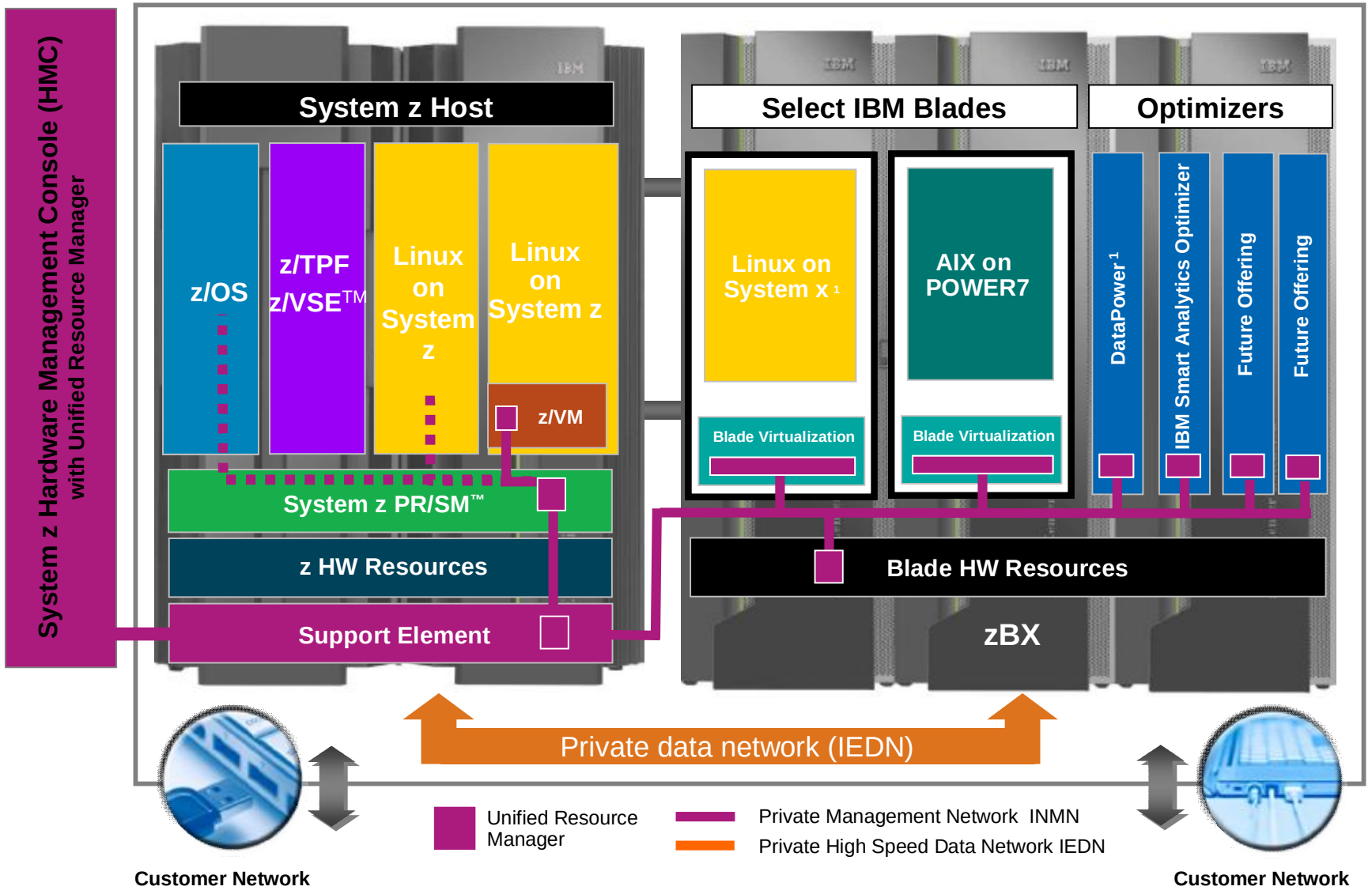
# Putting zEnterprise System to the Task

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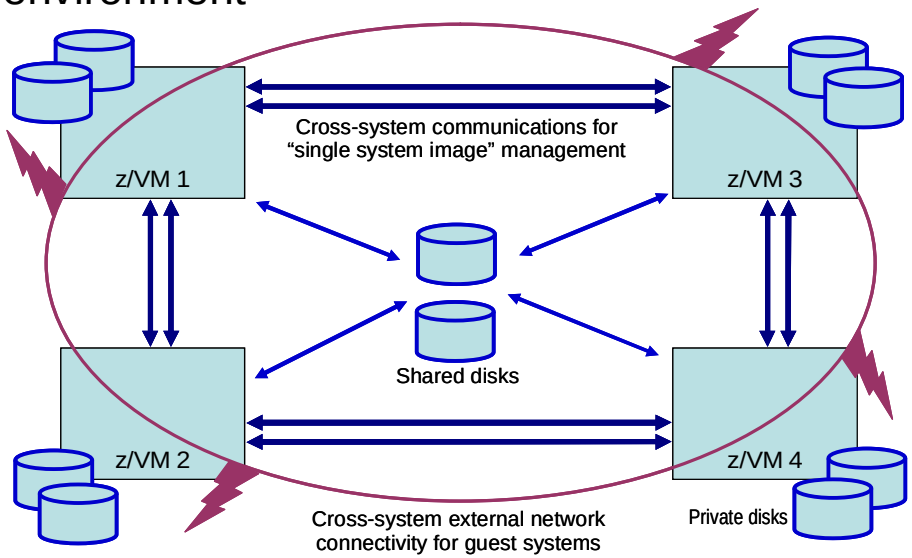
# z/VM V6 Statements of Direction
## *Clustered Hypervisor Support and Guest Mobility*

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




- Dynamically move Linux guests from one z/VM system 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

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# Agenda

- **IBM zEnterprise System**
- **z/VSE**
- **z/VM**
- **Linux on System z**
  - **Linux Distributions**
  - **SLES Performance**
  - **Oracle Solutions**
  - **Customer Case Studies**

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# IBM supported Linux Distributions for System z

| Distribution | zEnterprise 196 | System z10 | System z9 | zSeries |
|---|---|---|---|---|
| RHEL 5 | ✔ | ✔ | ✔ | ✔ |
| RHEL 4 (1) | — | ✔ | ✔ | ✔ |
| RHEL 3 (1) | — | — | * | ✔ |
| SLES 11 | ✔ | ✔ | ✔ | ✘ |
| SLES 10 | ✔ | ✔ | ✔ | ✔ |
| SLES 9 (1) | — | ✔ | ✔ | ✔ |
| (1) Also available as 31-bit distributions. | | | | |

✔ Indicates that the distribution (version) has been tested by IBM on the hardware platform, will run on the system, and is an IBM supported environment. Updates or service packs applied to the distribution are also supported.

✘ Indicates that the distribution is not supported by IBM.

— Indicates that the distribution has not been tested by IBM.

* Supported on customer request (RPQ).

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# RHEL 5 Update 5

## § GA since March 30, 2010

- Kernel GA: 2.6.18-194

## § New Features:

- ***FICON DS8000 Large Volume (EAV) Support:*** Allows to exploit DS8000 Storage feature to use DASD volumes >50GB.
- ***AF_IUCV SOCK_SEQPACKET support:*** Enhances existing AF_IUCV to allow customers to develop using SOCK_SEQPACKET.
- ***Provide CMS script for initial IPL:*** Avoids having to create a script to start a new installation under z/VM.
- ***Installer re-IPL support:*** Solves past restriction and allows the installer to direct reboot in the installed system right after installation

## § Bug fixes


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# SLES 11 SP1 (Page 1 of 2)

## § GA since June 2, 2010

- Kernel GA: 2.6.32

## § New Features:

- **ALL Linux on System z upstream kernel features since 2.6.27**
- **Suspend / Resume support:** stop a running instance and later continue operations. A suspended Linux instance does not require memory or processor cycles; gives you better performance, resource utilization, and power savings
- **Automatic IPL after dump:** extension to the shutdown action interface which combines the actions dump and re-ipl, helps increase availability and minimize downtime, as well as keep management and service costs low
- **DS8000 support - Large volume support architecture:** use one large volume instead of multiple small volumes, for your large amount of data. You no longer need to combine and manage various small disks anymore.
- **Support of HPF:** increases performance for database serving
- **Next generation crypto HW device driver exploitation:** new System z crypto hardware features and performance improvements are exploited by SUSE Linux Enterprise Server for System z. Hardware-driven crypto acceleration functions help reduce operations and maintenance costs.


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# SLES 11 SP1 (Page 2 of 2)

- **New Features:**
  - **AF_IUCV SOCK_SEQPACKET support:** improves close collaboration between SUSE Linux Enterprise Server for System z and z/VM in the networking area. This provides better performance for intra machine / VM communication.
  - **TTY terminal server over IUCV:** provides central access to the Linux console for the different guests of a z/VM. Full screen applications like vi are usable on the console.
  - **System z kernel message documentation:** Cleanup messages in System z related code, script to generate a man page for every kernel message
  - **FCP adjustable queue depth:** Customizable queue depth for SCSI commands in zfcp. In the past was at constant 32 queue entries. Improves performance.
- **Bug fixes**
- **More information:**

  http://www.ibm.com/developerworks/linux/linux390/documentation_novell_suse.html


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# SLES Performance Evaluation: SLES 11 vs SLES 10 SP2

| SLES11 RC5/GM vs. SLES10 SP2 | LPAR 64 throughput | LPAR 64 costs | LPAR 31 (emu) throughput | LPAR 31 (emu) costs | z/VM 64 throughput | z/VM 64 costs | z/VM 31 (emu) throughput | z/VM 31 (emu) costs |
|---|---|---|---|---|---|---|---|---|
| Scaling | to -25% | to -34% | to -25% | to -34% | | | | |
| Mixed I/O ECKD | to -36% | to -10% | | | to -40% | to -19% | | |
| Mixed I/O SCSI | to -14% | to -18% | | | to -18% | to -25% | | |
| Kernel | +80 to -66% | | | | +88% to -84% | | +84% to -55% | |
| Compiler INT | +55% to -7% | | | | | | | |
| Compiler FP | +12 to -18% | | | | | | | |
| Web serving | 0 to -10% | to -18% | | | +9% to -8% | +5% to -14% | | |
| Seq. I/O ECKD | rd to -17% | rd to -33% | | | r-14% to +16% | r-13%, w+16% | r-14% to +18% | r-12%, w+14% |
| Seq. I/O SCSI | r+33% to -38% | w+30%, r-40% | | | r-40% to +25% | r-88%, w+24% | r-40% to +17% | r-92%, w+17% |
| Rnd I/O ECKD | | to -33% | | | r-7%, w+10% | r-5%, w+17% | -6% to +8% | r+14%, w+17% |
| Rnd I/O SCSI | wr +12% | to -15% | | | r-12% to +33% | r-25%, w+20% | r-14% to +30% | r-29% to +17% |
| Seq. I/O ECKD DIO | | w+33%, r-14% | | | -2% to +5% | +12% to +46% | | |
| Seq. I/O SCSI DIO | | w-12% , r-11% | | | -5% to +1% | r-10%, w-14% | | |
| Rnd I/O ECKD DIO | | to -16% | | | -2% to +3% | +8% to +46% | | |
| Rnd I/O SCSI DIO | | to -14% | | | -5% to +1% | r-21%, w-16% | | |
| Java | to -4% | | to -6% | | | | | |
| GbE 1492/8992 | str -7% | to -45% | | | | | | |
| 10GbE 1492/8992 | str -7% | to -65% | | | | | | |
| HiperSockets 32K | 200x1000 -33% | to -66% | | | | | | |
| VSWITCH guest-guest 1492/8992 | | | | | to -28% | to -44% | | |
| VSWITCH GbE guest-LPAR 1492/8992 | | | | | 0 to -12% | to -54% | | |
| VSWITCH 10GbE guest-LPAR 1492/8992 | | | | | 0 to -10% | to -69% | | |
| attached GbE guest-LPAR 1492/8992 | | | | | 0 to -10% | to -35% | | |
| attached 10GbE guest-LPAR 1492/8992 | | | | | 0 to -9% | to -50% | | |
| HiperSockets 32K guest-LPAR 1492/8992 | | | | | o -16% | to -28% | | |

| Legend | n/a | better | equal | worse |
|---|---|---|---|---|


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# SLES Performance Evaluation: SLES 11 **SP1** vs SLES 10 SP3

| SLES11-SP1 vs. SLES10-SP3 | LPAR 64 throughput | LPAR 64 costs | LPAR 31 (emu) throughput | LPAR 31 (emu) costs | z/VM 64 throughput | z/VM 64 costs | z/VM 31 (emu) throughput | z/VM 31 (emu) costs |
|---|---|---|---|---|---|---|---|---|
| Scaling | +28% to -30% | -35% | +27% to -25% | -35% | | | | |
| Mixed I/O ECKD | +156% to -29%* | +3% to -30%* | | | +86% to -15%* | +4% to -25%* | | |
| Mixed I/O SCSI | +37% to -20%* | '+10% to -25%* | | | '+33% to -10%* | '+12% to -18%* | | |
| Kernel | +45% to -50% | | +45% to -50% | | +50% to -45% | | +50% to -45% | |
| Compiler INT | +54% to -8% | | | | | | | |
| Compiler FP | +17 to -18% | | | | | | | |
| Web serving | +17% to -15% | -15% | | | +48% to -15% | +7.5% to -11% | | |
| Seq. I/O ECKD | +128%* | +10% to -93%* | | | +151%* | +36% to -31%* | +127%* | +28% to -33%* |
| Seq. I/O SCSI | +28% to -5%* | +26% to -35%* | | | +63% to -5%* | +26% to -33%* | +36% to -6%* | +28% to -30%* |
| Rnd. I/O ECKD | +89%* | +7% to -9%* | | | +66%* | +7% to -2%* | +61%* | +5%* |
| Rnd I/O SCSI | +78% to -16%* | -7%* | | | +79% to -16%* | -6%* | +68% to -15%* | -10%* |
| Seq. I/O ECKD DIO | +75% | +37% to -10% | | | +116% | +25% | | |
| Seq. I/O SCSI DIO | -2% | +11% | | | -2% | +9% | | |
| Rnd I/O ECKD DIO | +75% | +10% | | | +115% | +29% | | |
| Rnd I/O SCSI DIO | +41% to +1% | +37% to +1% | | | +41% to +1% | +39% to +1% | | |
| Java | -2.9% | | -0.8% | | | | | |
| GbE 1492/8992 | +11% to -17% | +45% to -33% | | | | | | |
| 10GbE 1492/8992 | +35% to -20% | 9.8% to -78% | | | | | | |
| HiperSockets 32K | +9% to -13% | +21% to -15% | | | | | | |
| VSWITCH guest-guest 1492/8992 | | | | | +68% to -11% | +34% to -13% | | |
| VSWITCH GbE guest-LPAR 1492/8992 | | | | | +5% to -31% | +47% to -97% | | |
| VSWITCH 10GbE guest-LPAR 1492/8992 | | | | | +79% to -17% | +20% to -63% | | |
| attached GbE guest-LPAR 1492/8992 | | | | | +6% to -15% | +63% to -26% | | |
| attached 10GbE guest-LPAR 1492/8992 | | | | | +29% to -10% | +13% to -80% | | |
| HiperSockets 32K guest-LPAR 1492/8992 | | | | | +12% to -16% | +19% to -19% | | |

| Legend | n/a | better | equal | worse |
|---|---|---|---|---|

*including workarounds for known issues without fixes in code, but e.g. new tunables


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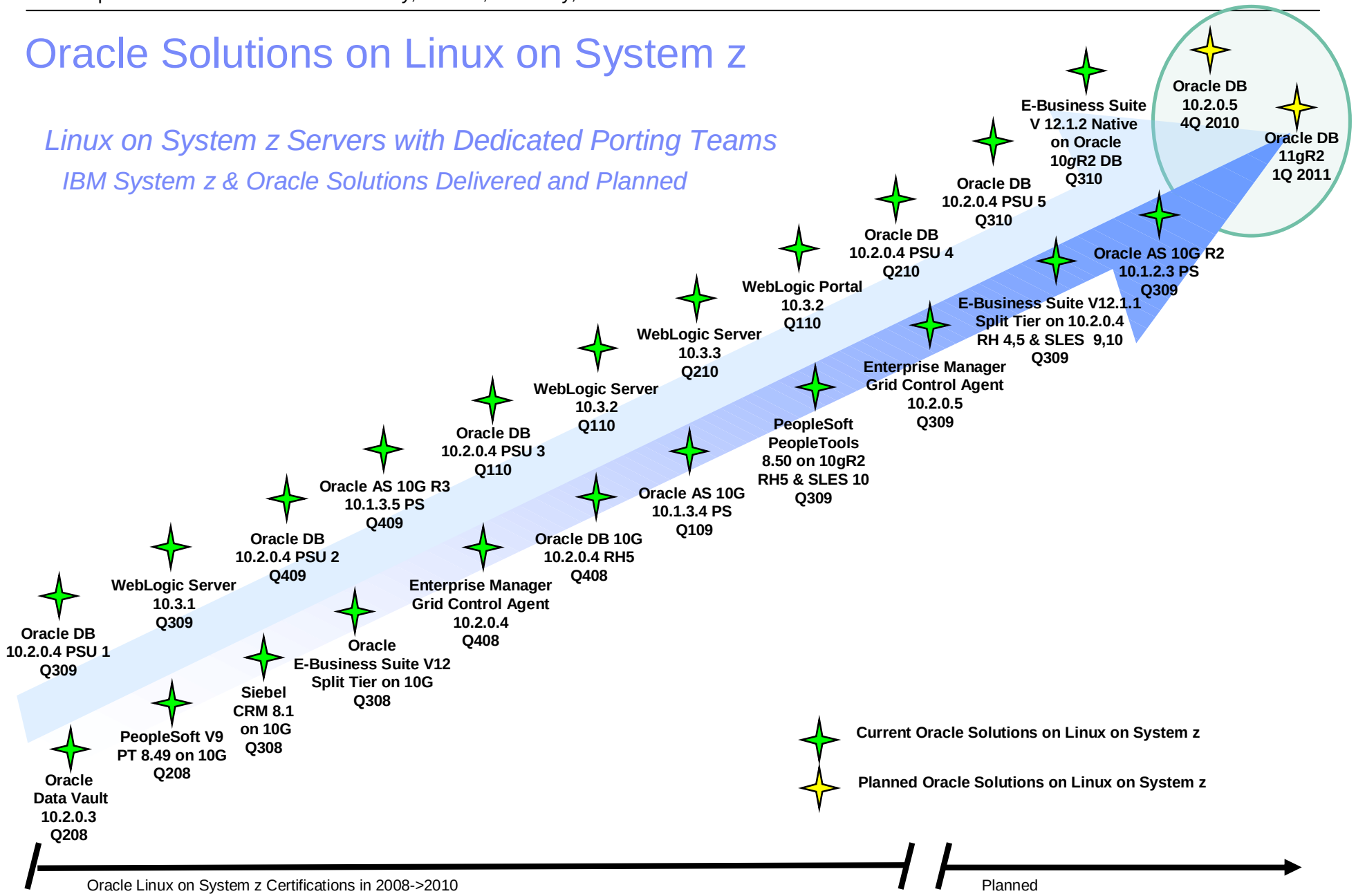
# Oracle Solutions on Linux on System z

*Linux on System z Servers with Dedicated Porting Teams*

*IBM System z & Oracle Solutions Delivered and Planned*



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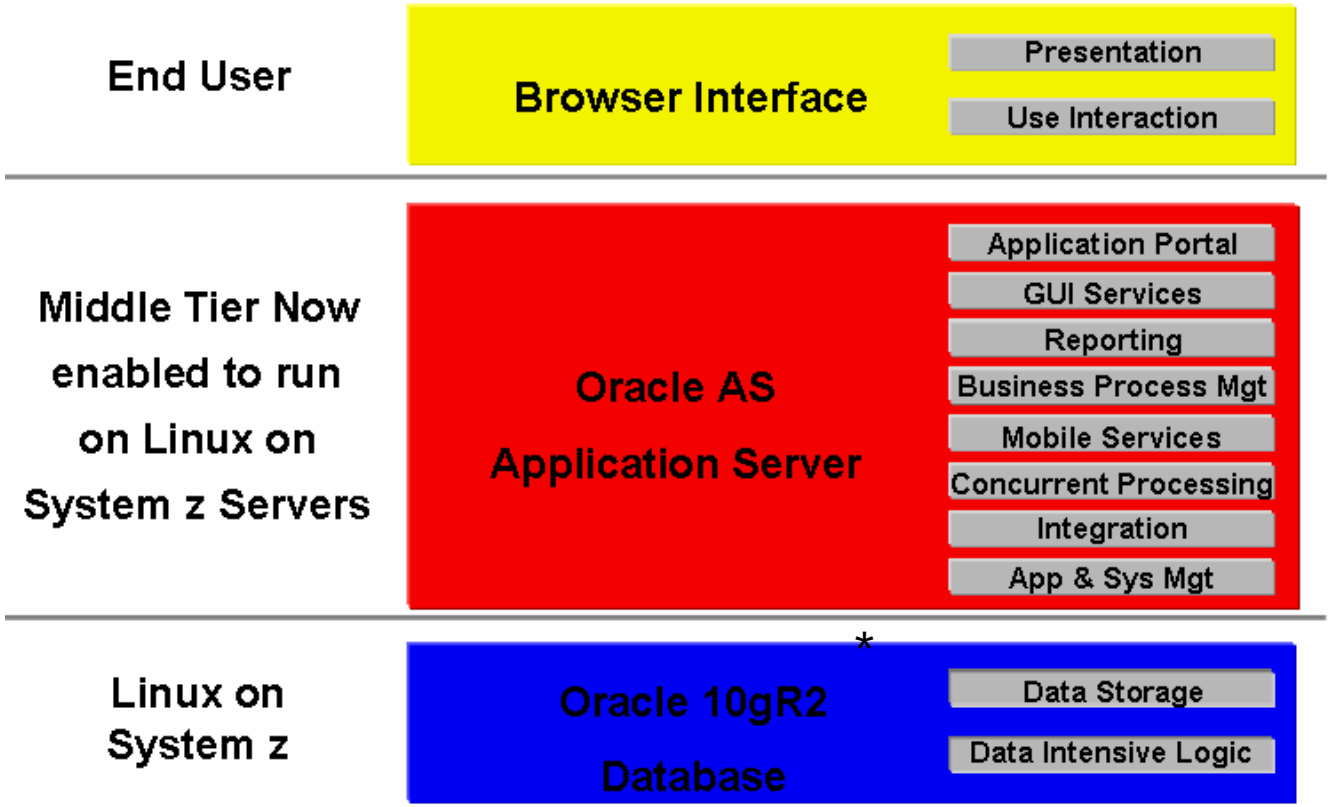
# Oracle - Now the full Application runs on Linux on System z !

Previously, Oracle E-Business Suite was available on System z in a “split tier mode” with only the Oracle 10*g*R2 database tier running on Linux on System z.




supported on z9 EC/BC, z10 EC/BC, and zEnterprise!

*Will support 11g in the future!

**Note**: Other Oracle solutions that are sometimes associated with E-Business Suite but are NOT supported on Linux for System z: Oracle Retail Suite, Retek, ProfitLogic, 360Commerce, Demantra, Oracle Transportation Management (G-Log), Oracle Pharmaceuticals (Clinical), Oracle iLearning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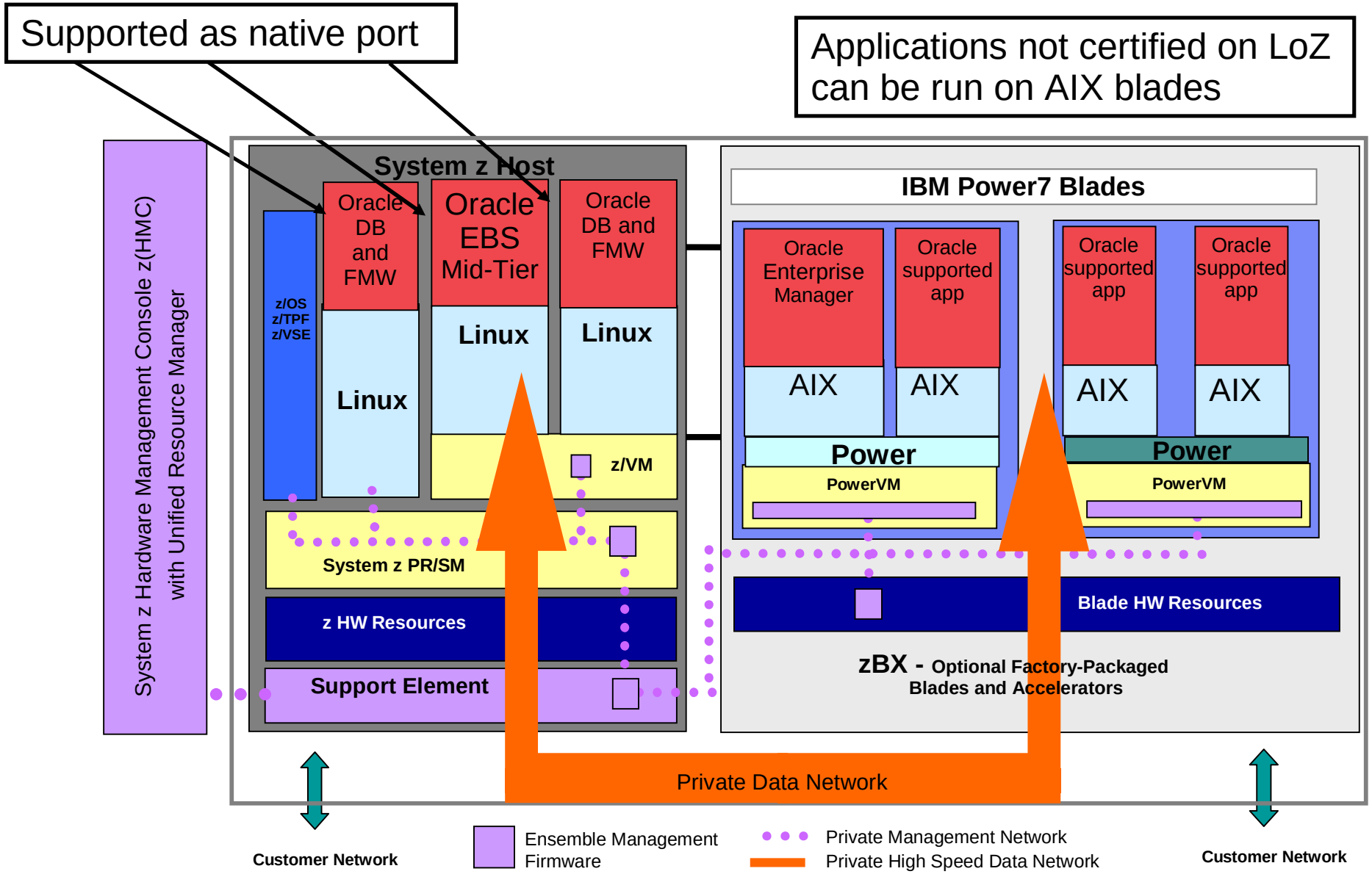
# Oracle E-Business Suite on zEnterprise with zBX (Example)





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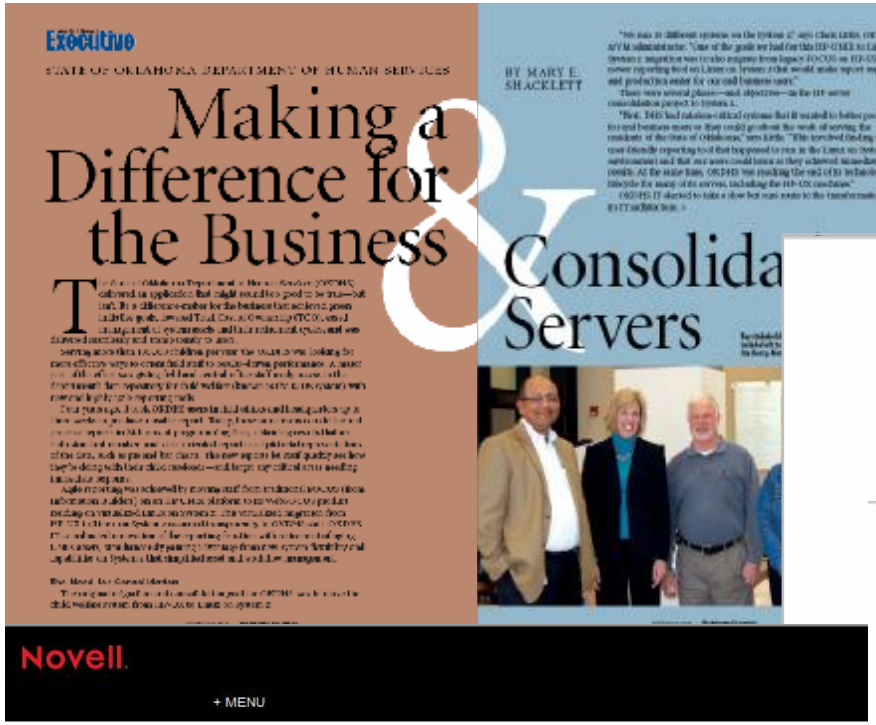
# Linux on System z Customer Case Studies (Examples)



Our Customers

## Idaho Power Company

**Idaho Power Company moved to SUSE Linux Enterprise Server on an IBM mainframe to improve performance and take advantage of virtualization, with dramatic cost reductions.**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# Financial Client consolidates 61 Sun and HP Servers to System z10 and saves 96% on Power and Cooling

| | FROM… | TO… |
|---|---|---|
| Current hardware infrastructure | Sun and HP servers | z10 EC™ |
| Footprints | 61 | 1 |
| Cores/Memory | 442 cores / 1440 GB | 16 IFLs / 82GB |
| Avg Utilization | 13.3% | 40% |
| Peak Utilization | 28.7% | 92% |
| # DBs, size of DB | 61 | 61 |
| Application | Oracle databases | Oracle databases |
| OS | Sun Solaris, HP-UX, Linux | Linux on System z |
| Savings:<br>Power & cooling (Whr)<br>Heat (BTUs/hr) | <br>345,618 Whr<br>737,030 BTUs/hr | <br>14,766 Whr - 96%<br>39,648 BTUs/hr - 95% |

**Summary of Benefits:** Software savings, energy requirements reduced, better utilization


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# Summary

- **IBM and its partners are heavily investing in System z**
- **Customers around the world are growing with System z**
- **With a current z/VM, z/VSE and/or Linux on System z, you are well positioned for the future.**

zEnterprise.

A New Dimension in Computing

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# Questions

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# Happy Birthday z/VSE: 45th Anniversary!

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