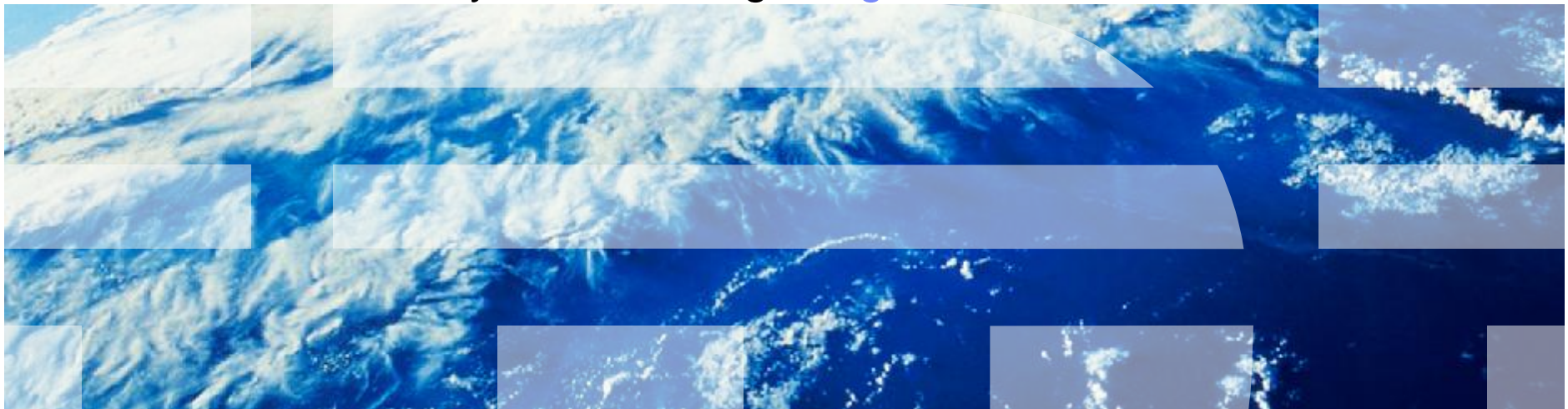


z/VSE Trends & Directions

Klaus Goebel, z/VSE Systems Manager, kgoebel@de.ibm.com





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| CICS* | HyperSwap | Parallel Sysplex* | VSE/ESA |
| DB2* | IBM* | PR/SM | VTAM* |
| DB2 Connect | IBM eServer | Processor Resource/Systems Manager | WebSphere* |
| DirMaint | IBM e(logo)server* | RACF* | z/Architecture |
| e-business logo* | IBM logo* | Resource Link | z/OS* |
| ECKD | IMS | RMF | z/VM* |
| Enterprise Storage Server* | Language Environment* | S/390* | z/VSE |
| ESCON* | MQSeries* | Sysplex Timer* | zSeries* |
| FICON* | Multiprise* | System z9 | |
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| Geographically Dispersed Parallel Sysplex | On demand business logo | Virtualization Engine | |

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Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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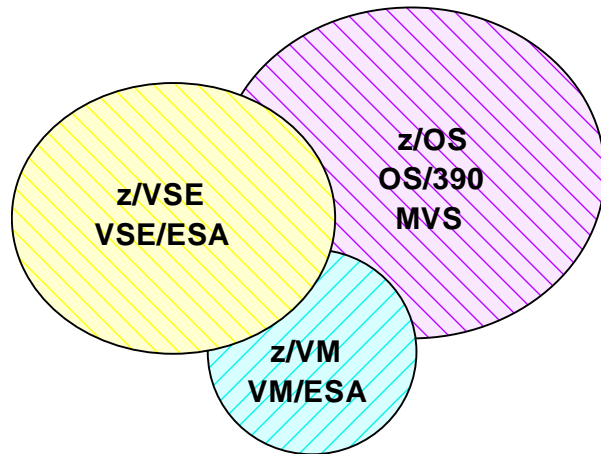
Agenda

- § **z/VSE Status & Support**
- § **z/VSE Strategy**
- § **z/VSE Modernization Options**
- § **z/VSE Software Pricing**
- § **z/VSE Functional Enhancements**
 - z/VSE V4.3
 - z/VSE V5.1
 - z/VSE V5.1 + PTFs
- § **Wrap-up**

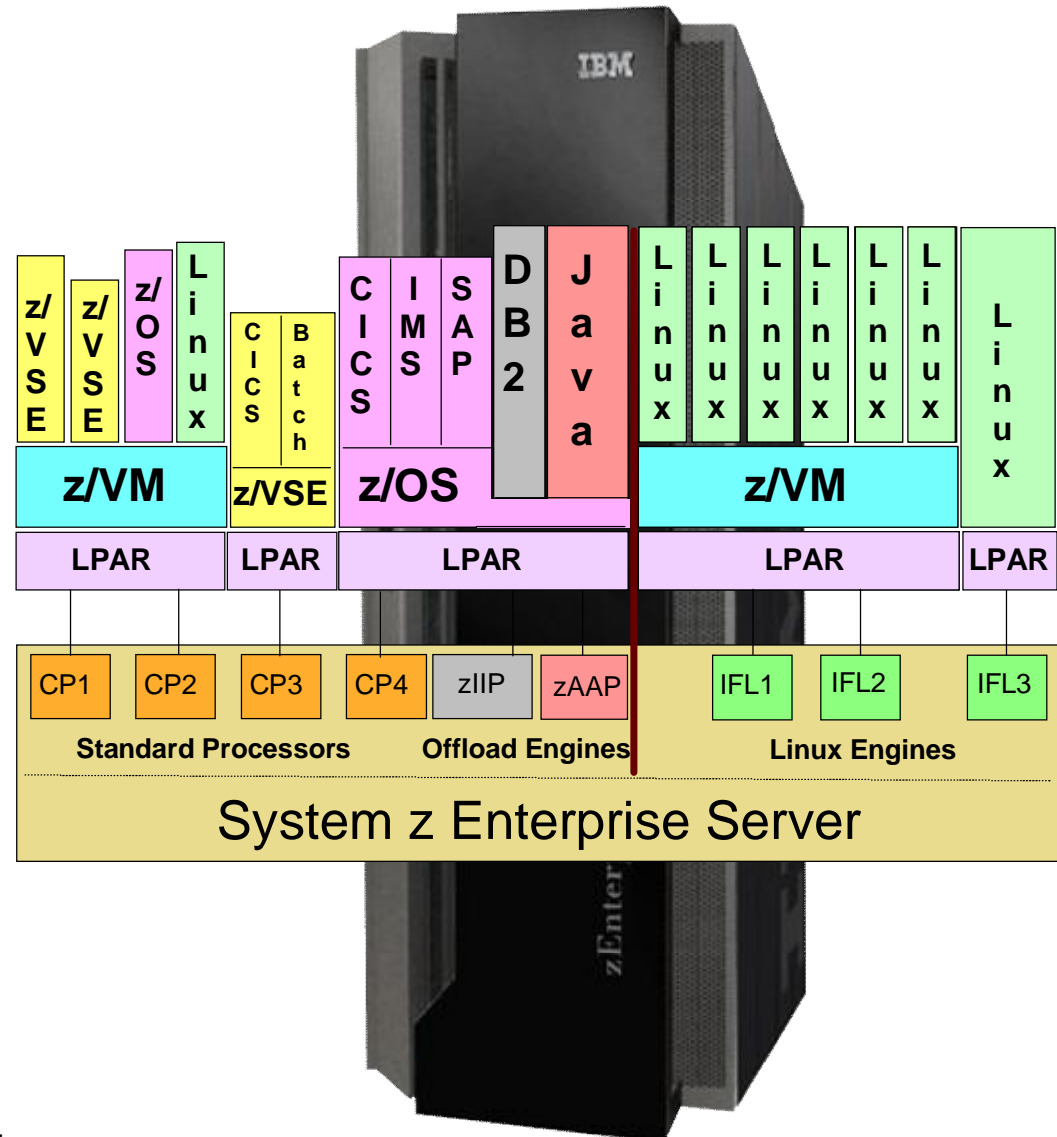


Operating Systems on IBM System z

- § 33% of worldwide traditional mainframe operating system installs are VSE*

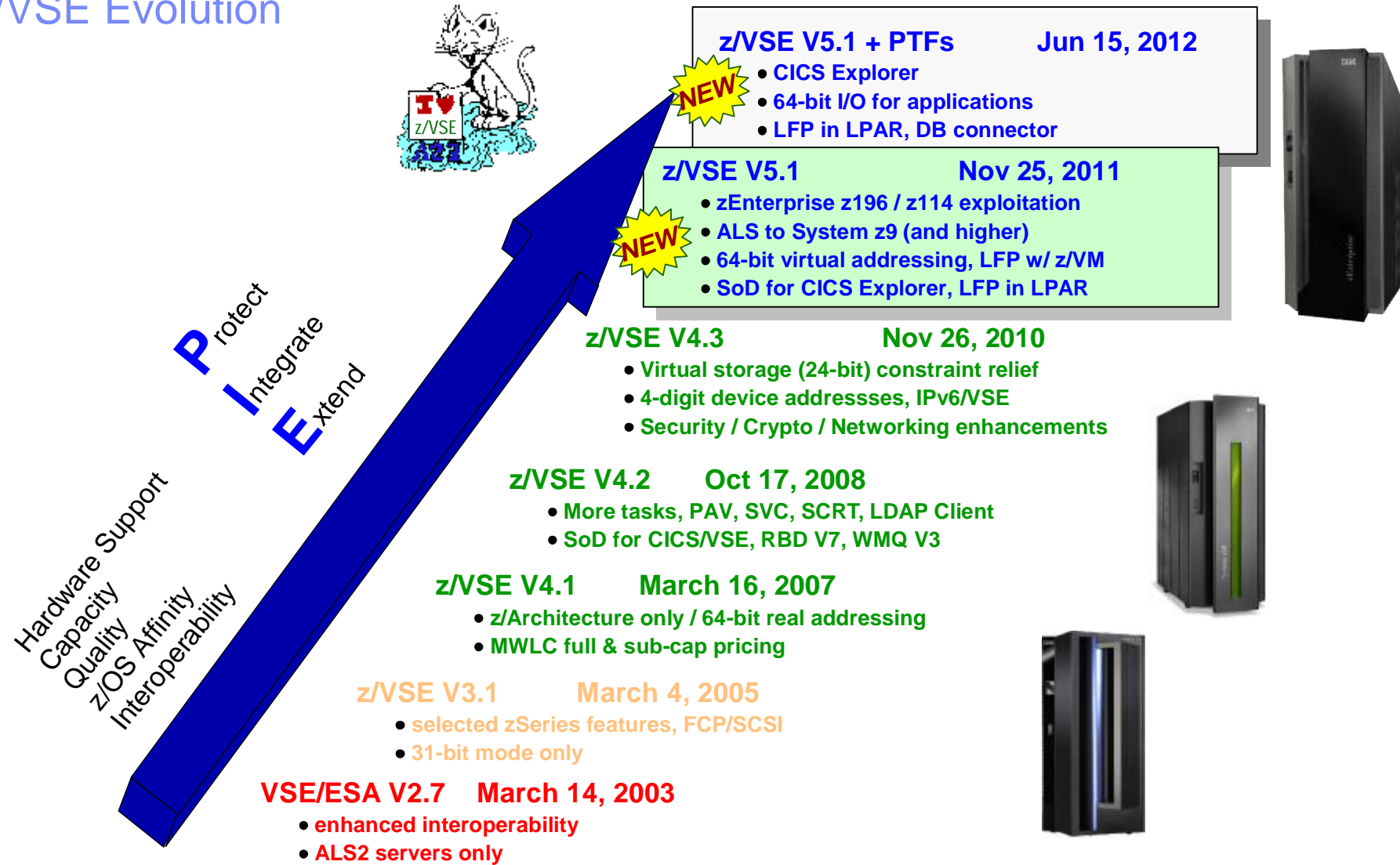


- § VSE population is 40% in US, 40% in Europe, 20% in RoW
- § Worldwide 50% run VSE under z/VM, in Europe 90+% are VSE under z/VM
- § IFLs play an important role in VSE's strategy
- § zIIP/zAAP have no meaning to VSE



(*) The term "VSE" stands for both, VSE/ESA and z/VSE.

z/VSE Evolution



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 April 2012)

| <i>VSE Version and Release</i> | <i>Marketed</i> | <i>Supported</i> | <i>End of Support</i> |
|--------------------------------|-----------------|------------------|-----------------------|
| z/VSE V5.1 | a | a | tbd |
| z/VSE V4.3 | 06/30/2012 | a | tbd |
| z/VSE V4.2 | r | a | 10/31/2012 |
| z/VSE V4.1²⁾ | r | r | 04/30/2011 |
| z/VSE V3.1¹⁾ | 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)

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, 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 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

z/VSE Support for IBM zEnterprise - Overview

§ zEnterprise compatibility

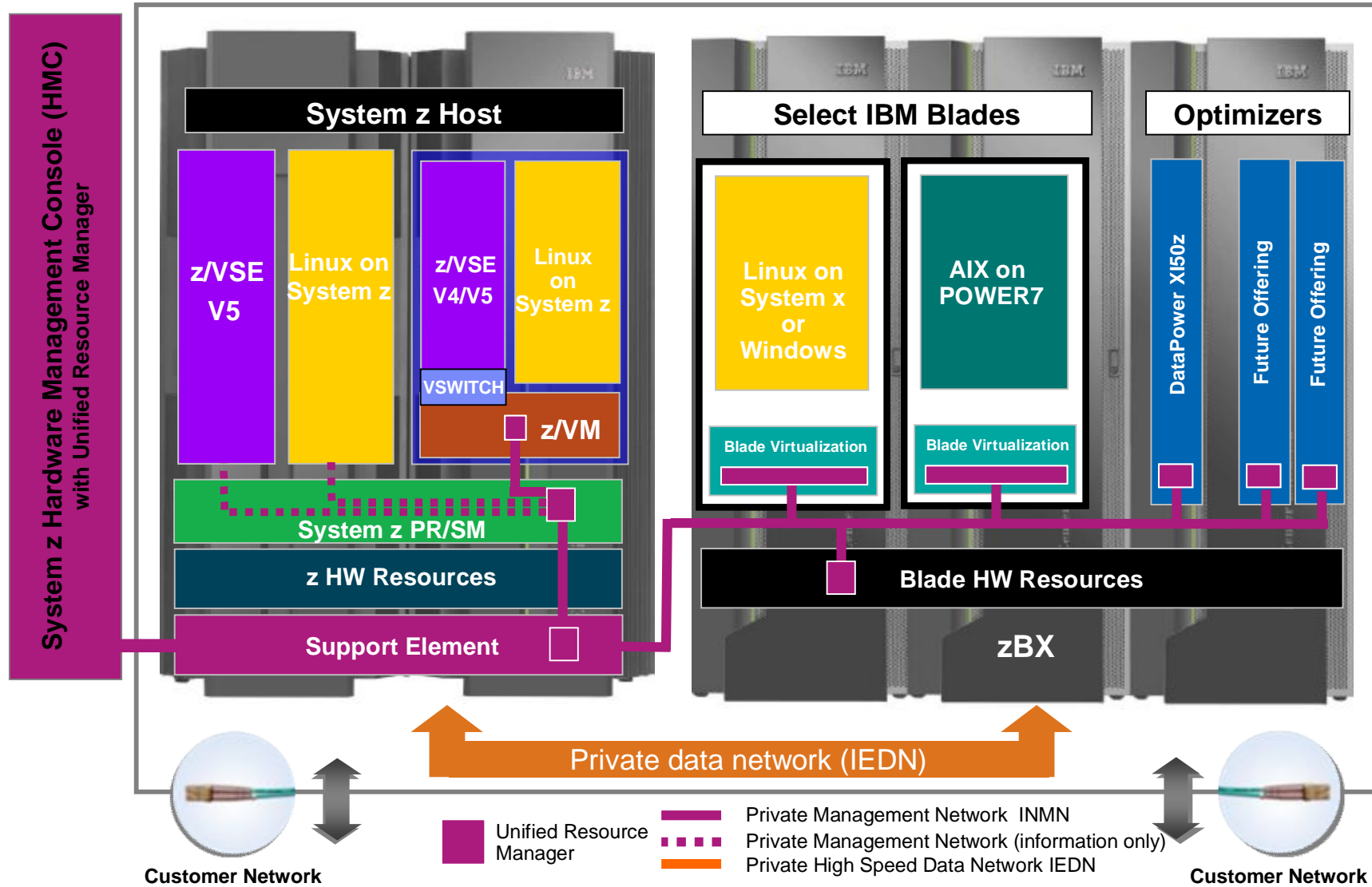
- **z114 and z196 are supported by z/VSE V4.2, z/VSE V4.3, and z/VSE V5.1**
 - Refer to z/VSE Preventive Service Planning (PSP) buckets
 - z/VSE PTFs are required for subcapacity pricing customers and QVS (Query Virtual Server)

§ zEnterprise exploitation

- **z196 exploitation**
 - Static power save mode for use with SCRT
(exclusively on z196 only)
- **z114 and z196 exploitation**
 - Fast Path to Linux on System z in a z/VM-mode LPAR
(also available on z10 BC/EC)
 - z/VSE z/VM IP Assist (VIA)
(exclusively on zEnterprise)
 - Fast Path to Linux on System z in an LPAR environment
(exclusively on zEnterprise)
 - Dynamic add of logical CPs
(also available on z10 BC/EC)
 - Large page (1 MB frames) support for data spaces
(also available on z10 BC/EC)
 - Dynamic add / remove of cryptographic processors
(also available on z10 BC/EC)
 - Crypto Adjunct Processor (AP) Queue interrupt facility
(also available on z10 BC/EC)
 - 4096-bit RSA key support with configurable Crypto Express3
(also available on z10 BC/EC)
- **zBX environment**
 - z/VSE V5 provides native Intra Ensemble Data Network (IEDN) support
 - z/VSE V4 can participate in an IEDN data network using z/VM's V6 VSWITCH support



z/VSE Exploitation of IBM zEnterprise - IEDN to zBX



Agenda

§ z/VSE Status & Support

→ § z/VSE Strategy

§ z/VSE Modernization Options

§ z/VSE Software Pricing

§ z/VSE Functional Enhancements

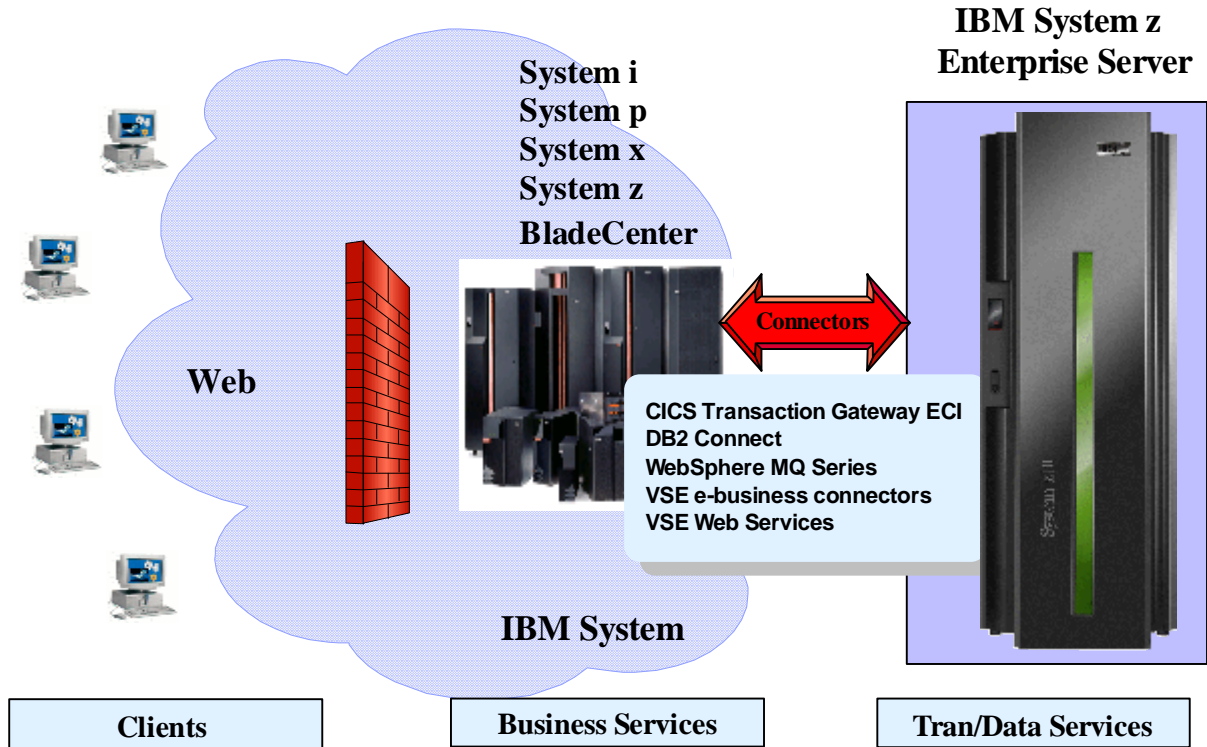
- z/VSE V4.3
- z/VSE V5.1
- z/VSE V5.1 + PTFs

§ Wrap-up



z/VSE Strategy - Invented in Year 2000

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

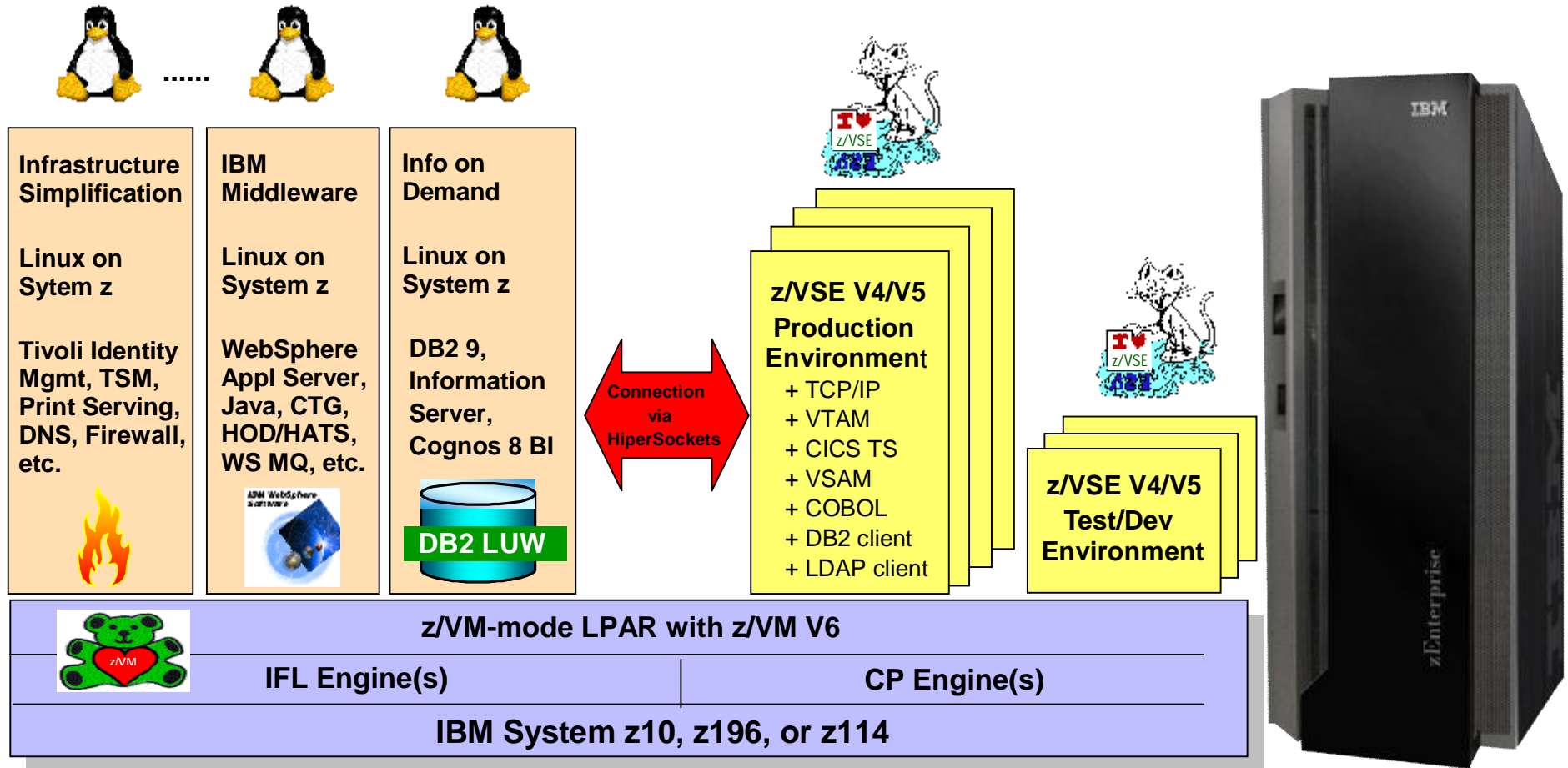


Protect existing VSE investments
Integrate using middleware and VSE connectors
Extend with another platform to access new applications & solutions

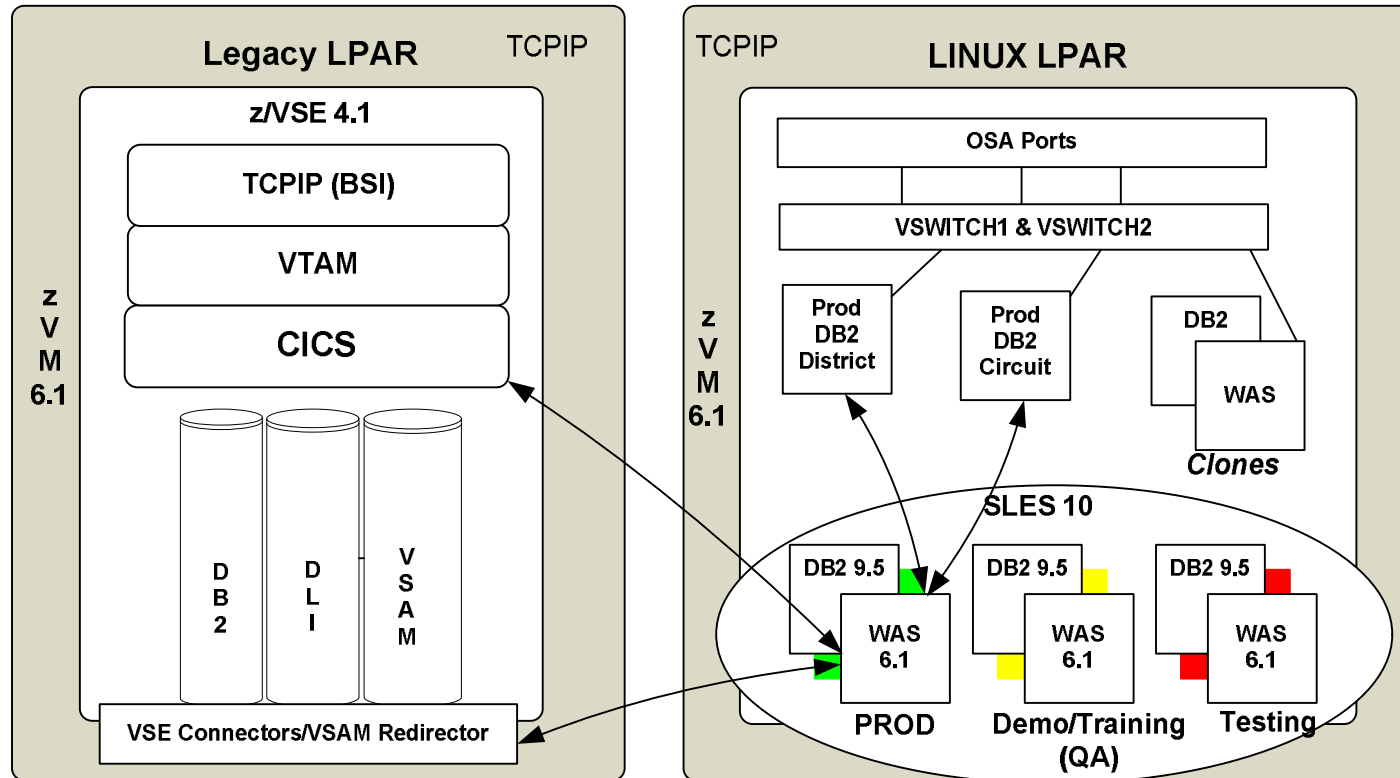
z/VSE Strategy w/ Linux on System z

Hybrid Environment leveraging z/VSE, z/VM, and Linux on System z

- P**rotect existing VSE investments
- I**ntegrate using middleware and VSE connectors
- E**xtend with Linux on IBM System z technology & solutions



Customer Example: Supreme Court of Virginia



- 1 + 1 z10 BC L02
- 2 + 2 CPs
- 5 + 5 IFLs
- 112 + 112 GB memory
- 2 + 2 z/VM V6.1 LPARs
- 8 + 4 z/VSE V4.1 guests
- 73 + 24 SLES 10 SP2 guests
- WAS V6.1, DB2 V8.2, DB2 V9

§ z10 BC L02 for Court System (internal)

- Serves 325 courts, 5.000+ users, 4.2 million new cases in 2009
- Integrating z/VSE, DB2/UDB and WebSphere applications
- eMagistrate* system serves 125 locations, 2.800 trans per day
- *2007 ComputerWorld Honors Program Laureate

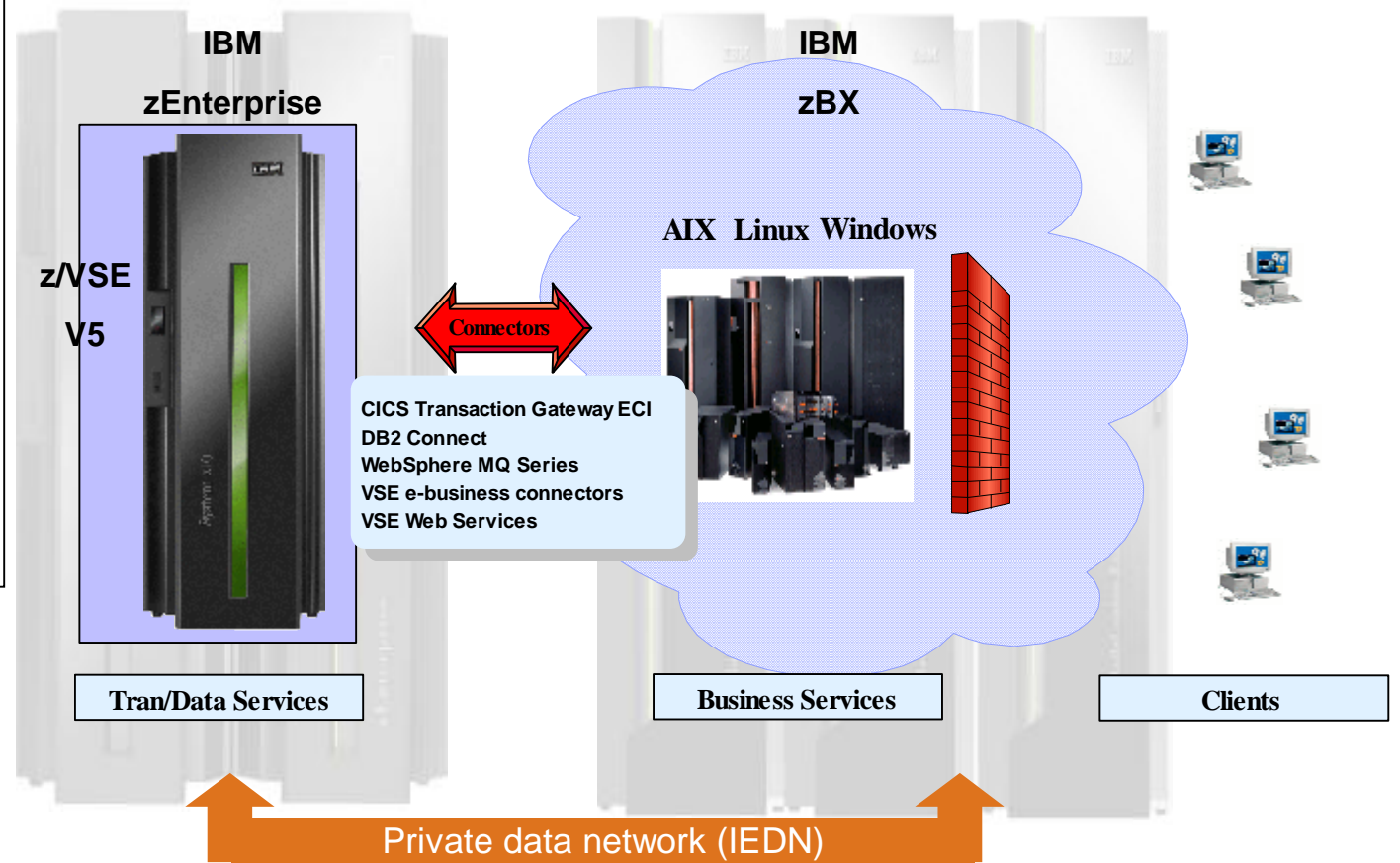
§ z10 BC L02 for Internet

- eCommerce application integrating z/VSE and WebSphere apps



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

Agenda

§ z/VSE Status & Support

§ z/VSE Strategy

→ § z/VSE Modernization Options

§ z/VSE Software Pricing

§ z/VSE Functional Enhancements

- z/VSE V4.3
- z/VSE V5.1
- z/VSE V5.1 + PTFs

§ Wrap-up



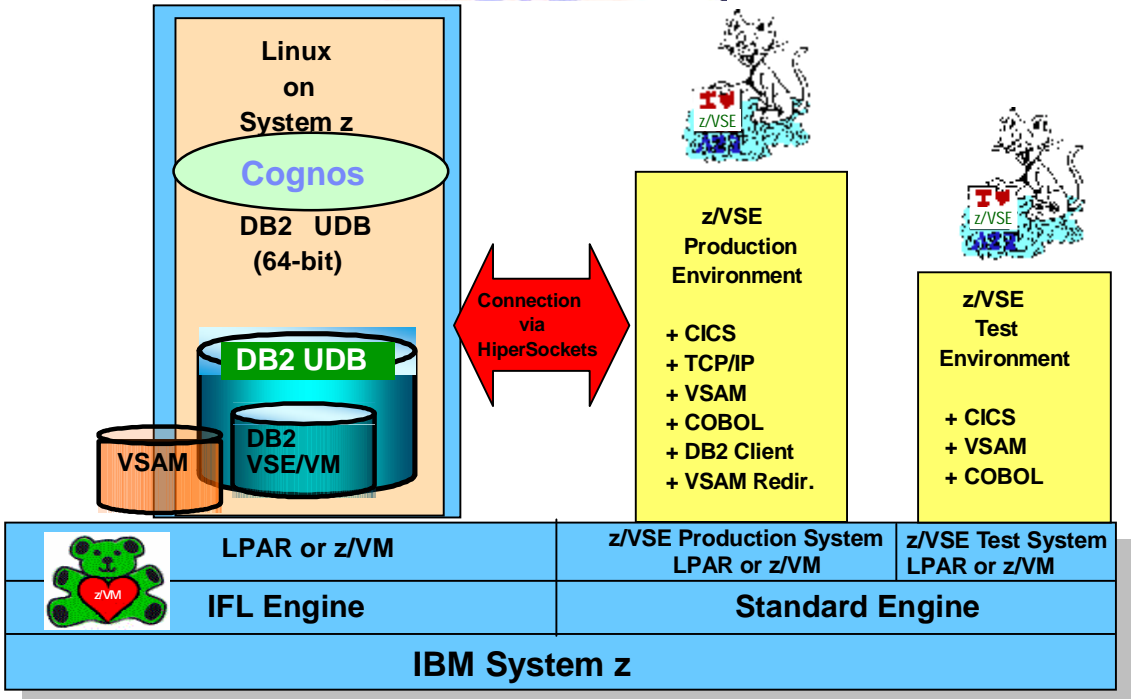


z/VSE SOA and Interoperability

| Connector Functions | z/VSE V5.1 | z/VSE V4.3 | z/VSE V4.2 | z/VSE V4.1 |
|--|------------|------------|------------|------------|
| z/VSE Connectors (no additional charge) | | | | |
| VSAM, POWER, Librarian, ICCF lib, console | Yes | Yes | Yes | Yes |
| VSAM Redirector | Yes | Yes | Yes | Yes |
| SOA Web Services, i.e. SOAP and XML | Yes | Yes | Yes | Yes |
| z/VSE Script and DL/1 | Yes | Yes | Yes | Yes |
| DB2 Stored Procedures for VSAM and DL/1 | Yes | Yes | Yes | Yes |
| VTAPE interface to IBM Tivoli Storage Manager (TSM) | Yes | Yes | Yes | Yes |
| LDAP client (LDAP server on another platform required) | Yes | Yes | Yes | |
| SNMP agent | Yes | Yes | | |
| Linux Fast Path from z/VSE to Linux TCP/IP in z/VM-mode LPAR | Yes | Yes | | |
| z/VSE z/VM IP Assist (VIA) | Yes | | | |
| GDPS client | Yes | | | |
| Linux Fast Path via zEnterprise HiperSockets Completion Queues | Yes | | | |
| DBCLI connector | Yes | | | |
| IBM Middleware (priced) | | | | |
| CICS Transaction Gateway ECI | Yes | Yes | Yes | Yes |
| Host on Demand / Host Application Transformation | Yes | Yes | Yes | Yes |
| DB2 Connect / DB2 UDB (DB2 Server for z/VSE V7.5 Client) | Yes | Yes | Yes | Yes |
| WebSphere MQ (z/VSE Client no charge) | Yes | Yes | Yes | Yes |

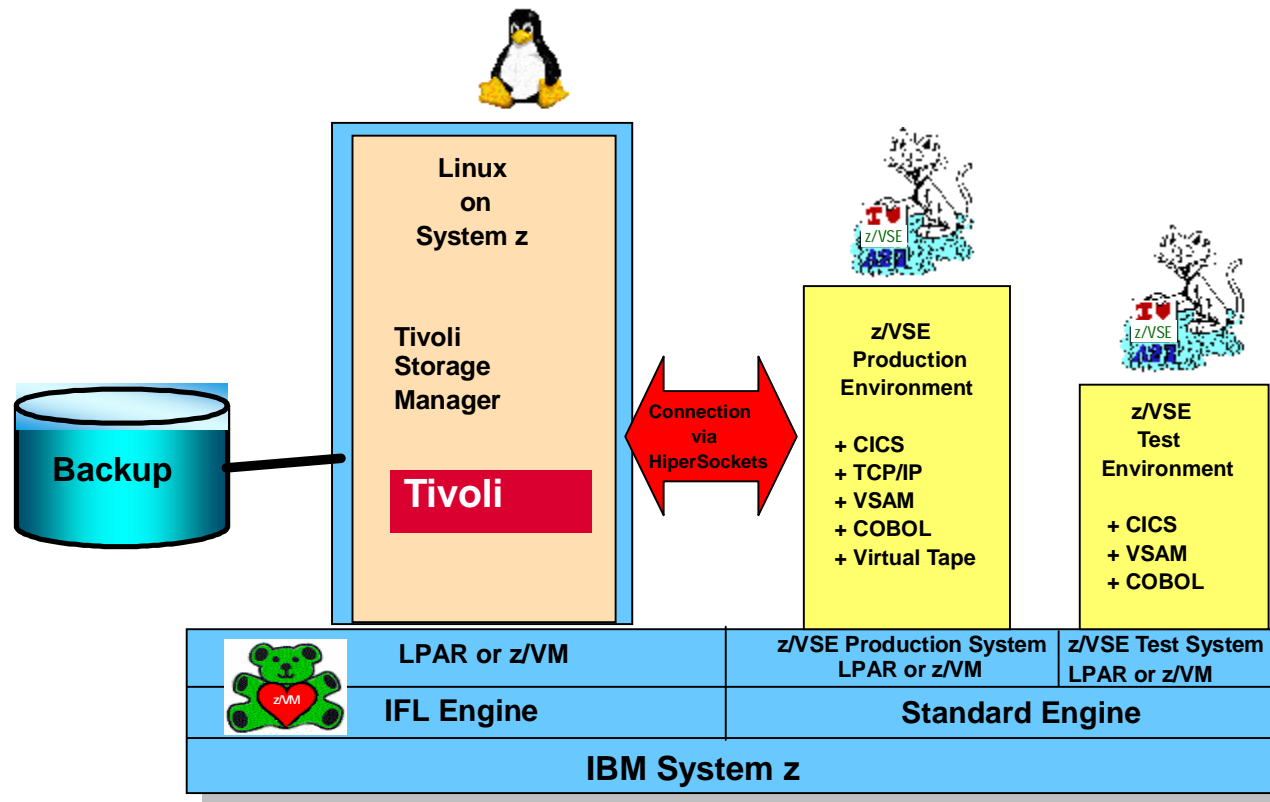
The No1 scenario, worldwide: DB2 LUW for z/VSE Customers

Data consolidation & data warehouse solutions with DB2 UDB on System z



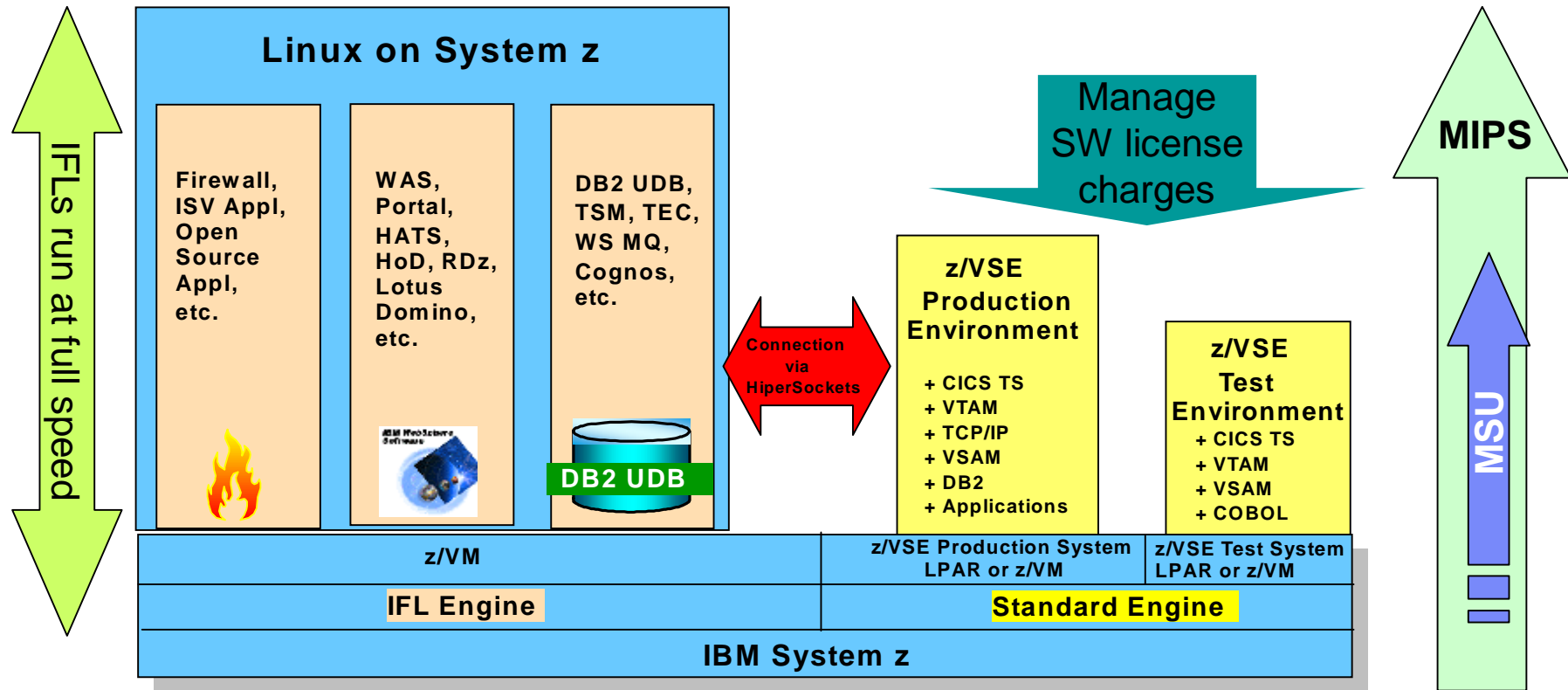
Evolving usage scenario: Backup / Restore Concept for z/VSE

Integrate z/VSE with TSM on Linux on System z

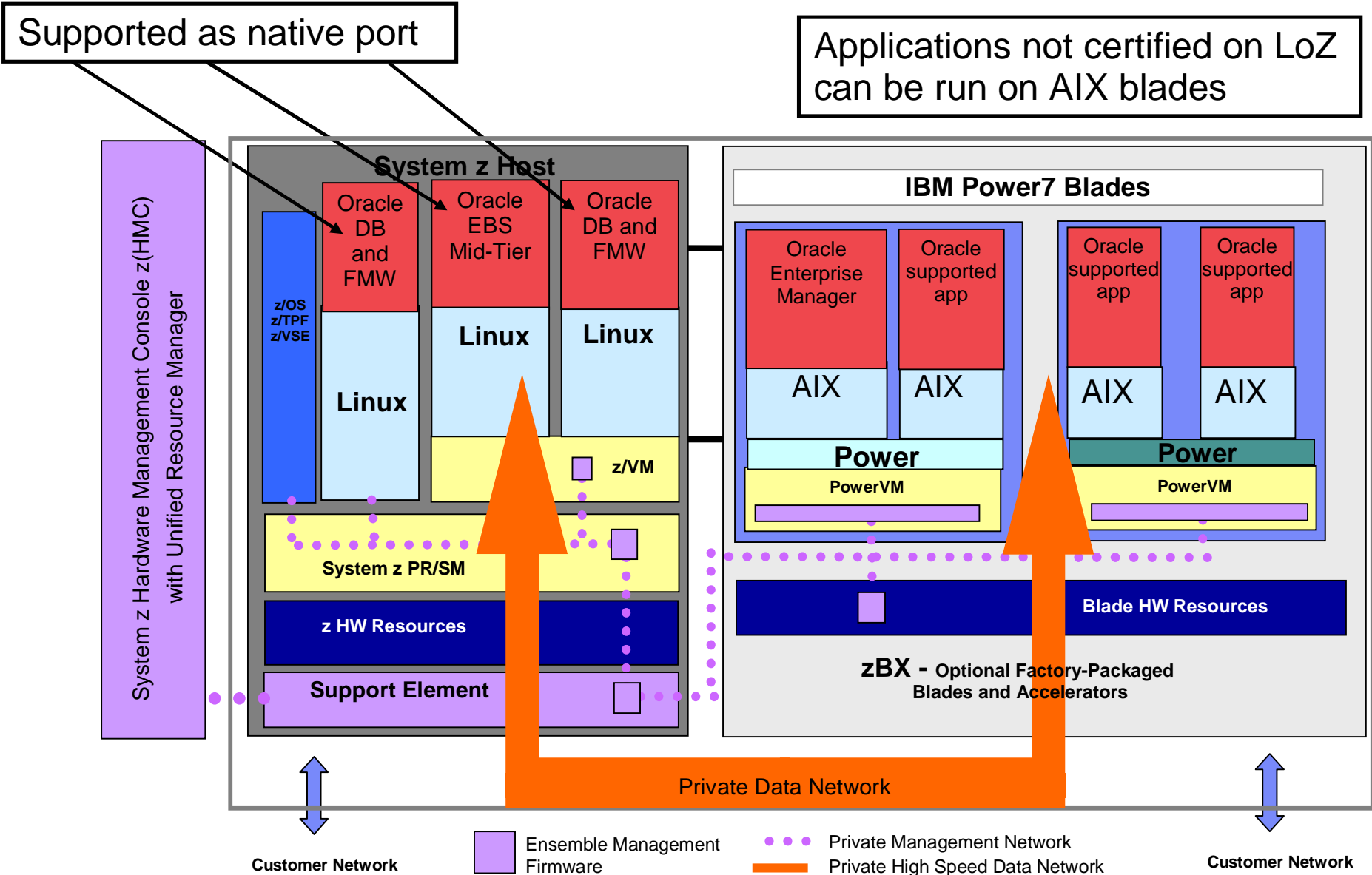


Combine the Scenarios, Manage Software Cost

- P**rotect existing z/VSE investments
- I**ntegrate using middleware and z/VSE connectors
- E**xtend with Linux technology and new solutions



Additional Options with zEnterprise (Example: Oracle e-Business Suite)



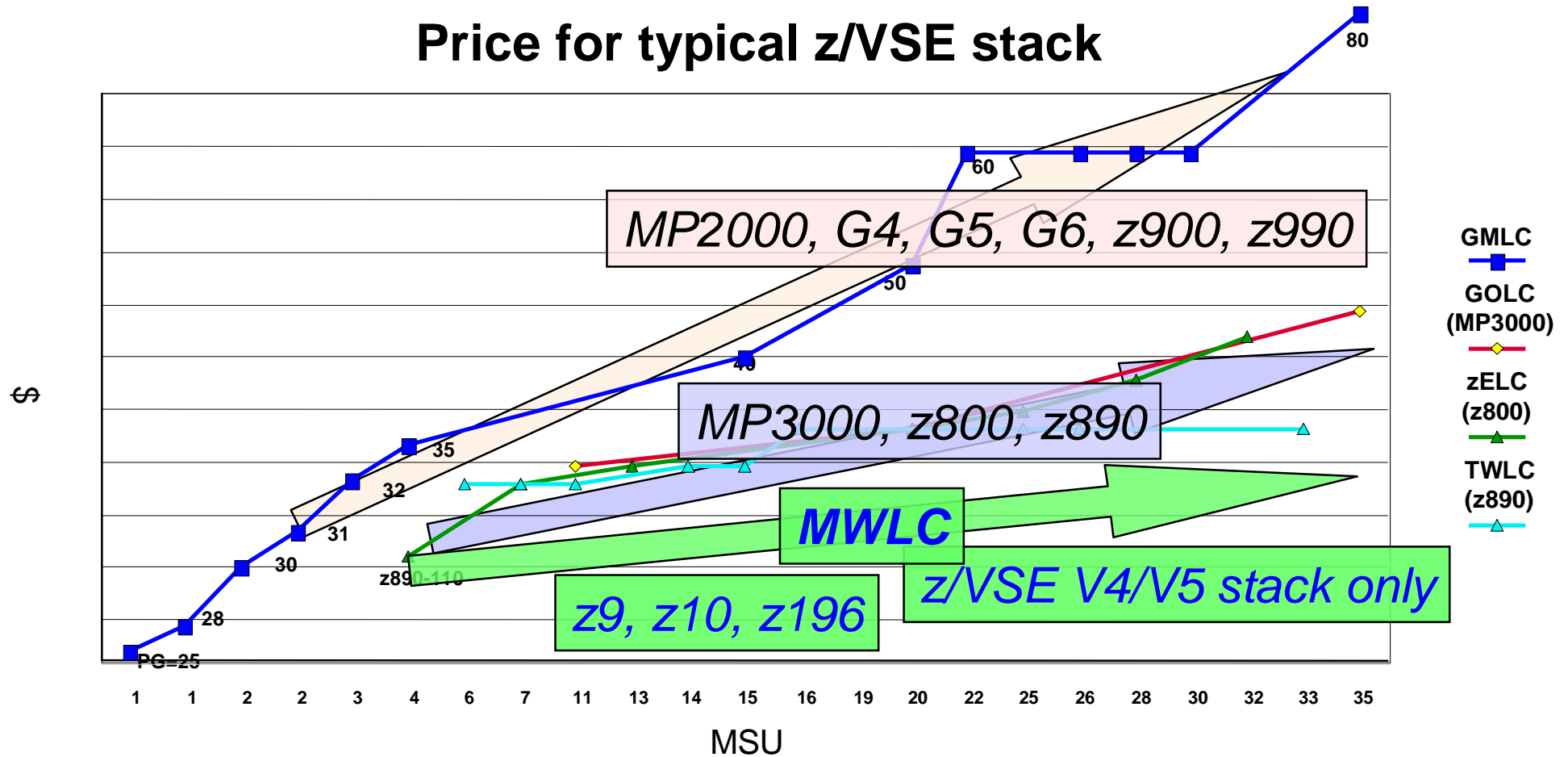
Agenda

- § z/VSE Status & Support
- § z/VSE Strategy
- § z/VSE Modernization Options
- § z/VSE Software Pricing
- § z/VSE Functional Enhancements
 - z/VSE V4.3
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 - z/VSE V5.1 + PTFs
- § Wrap-up



MWLC – Midrange Workload License Charge on z9, z10, and z196

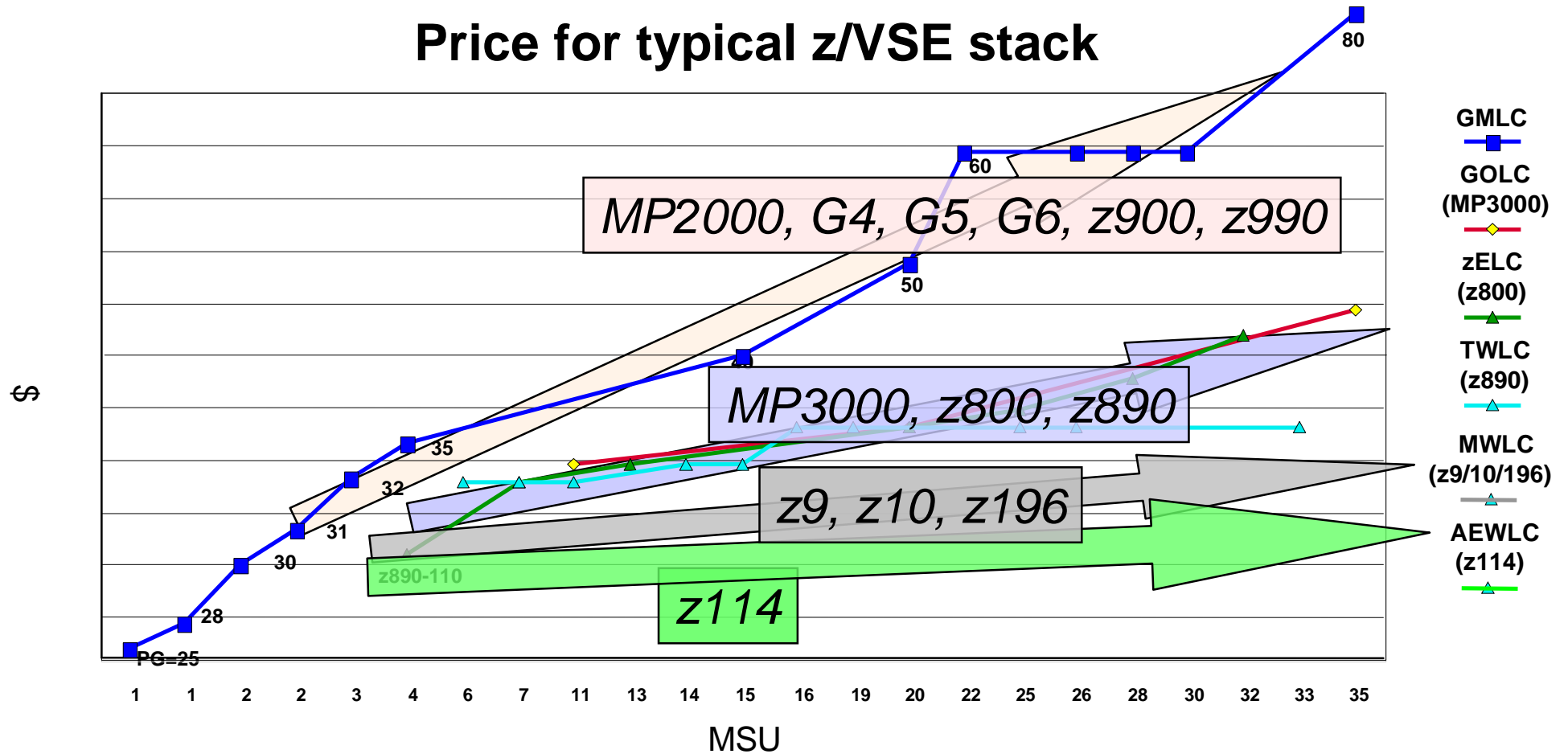
Price for typical z/VSE stack



§ "I just got our April software bill from IBM for the first month on our z9 under z/VSE 4.1 and MWLC. We were paying \$22,965 per month on our z800 under z/VSE 3.1.2. The April bill is for the same software and it is \$12,318: a difference of \$10,647 per month." Mike Moore, IT Manager, Alabama Judicial Datacenter, Alabama

AEWLC – Advanced Entry Workload License Charge on z114

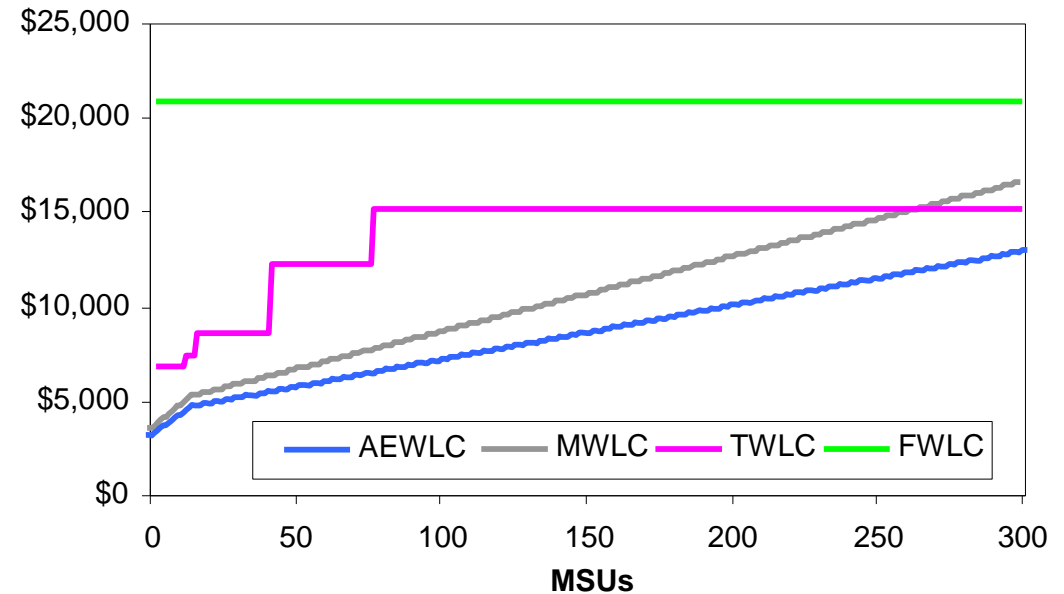
Price for typical z/VSE stack



Improved TCO through new Pricing Metric and Sub-Capacity Pricing

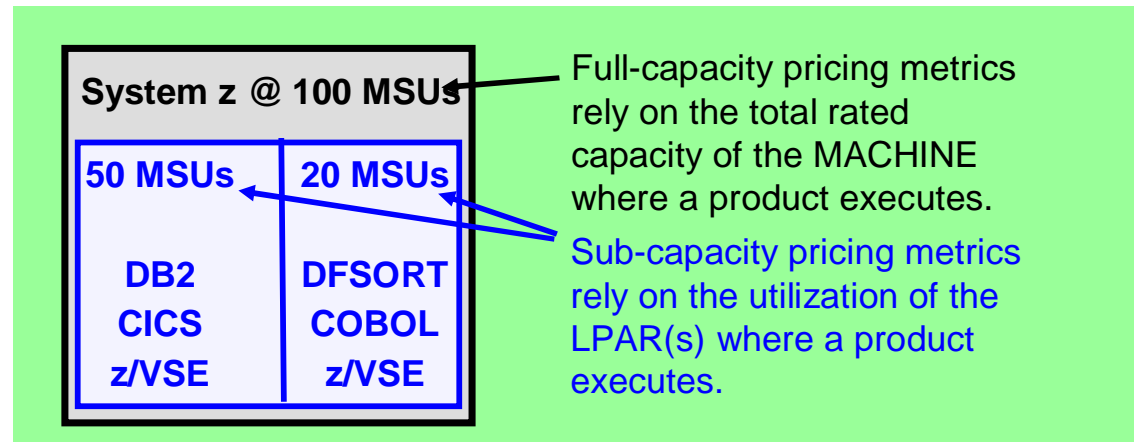
§ z/VSE price/performance through new pricing metric

- Advanced Entry Workload License Charge (**AEWLC**)
- AEWLC requires z114 and current z/VSE software (z/VSE V4 or V5)



§ 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, and z114-A01 are priced zELC.

Agenda

- § z/VSE Status & Support
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 - z/VSE V4.3
 - z/VSE V5.1
 - z/VSE V5.1 + PTFs
- § Wrap-up

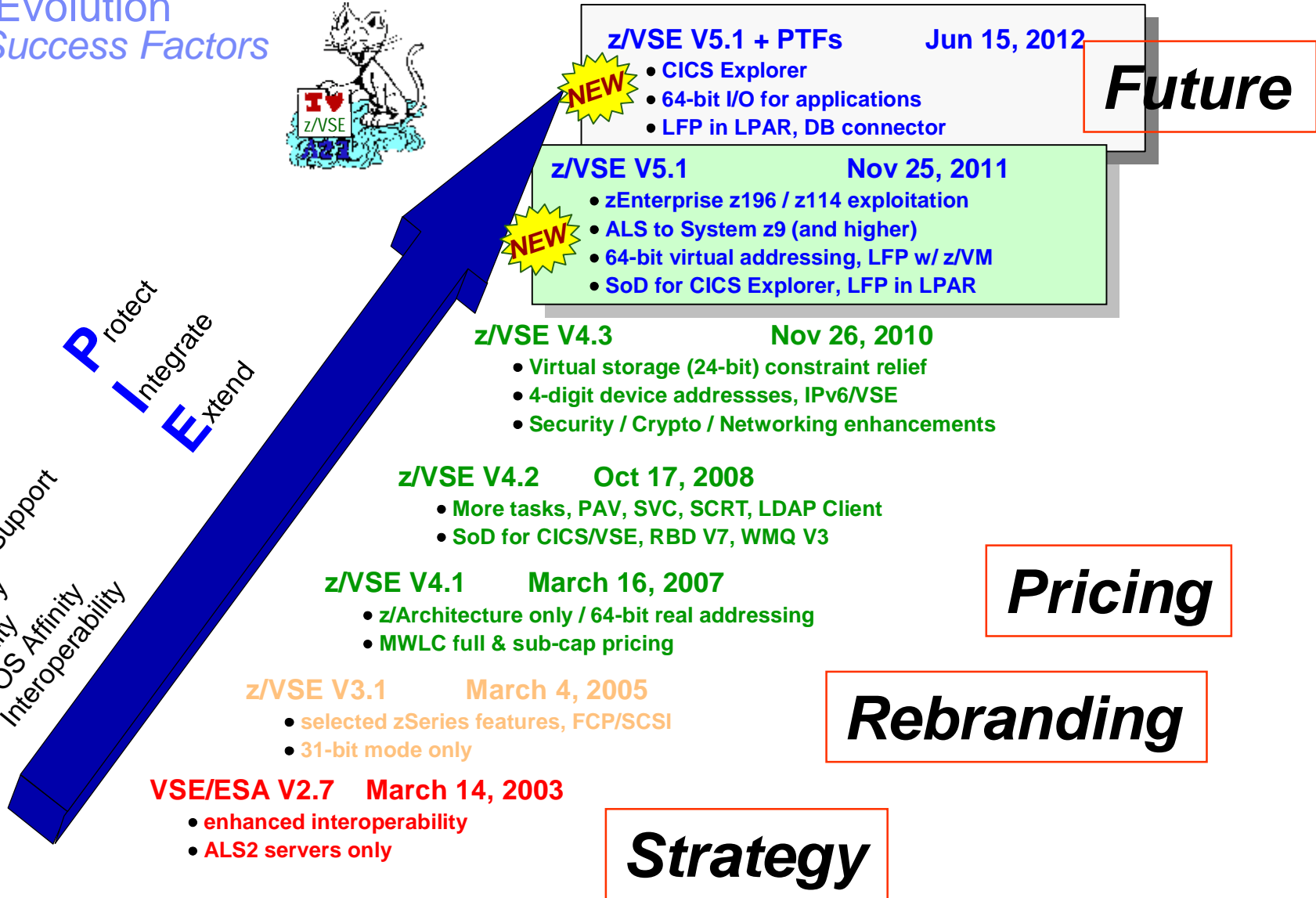


z/VSE Evolution

z/VSE Success Factors



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



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 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 V4.3 - General Availability since 11/26/2010

Previewed 10/20/2009, refreshed 07/22/2010, fully announced 10/05/2010

§ 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](#)

Black = previewed

[Blue = added w/ full announce](#)

§ 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](#)

§ 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 V1.1 as optional product (IPv6 solution)

- [IBM IPv6/VSE – licensed from BSI – includes IP stack & applications for both, IPv6 and IPv4](#)

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

Previewed 04/12/2011, fully announced 10/12/2011

§ 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

Black = previewed

Blue = added w/ full announce

§ 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](#)



z/VSE V5.1 + PTFs: Add'l Enhancements - GA planned for 06/15/2012* Announced 04/03/2012

§ **Support IBM CICS Explorer – the new face of CICS Transaction Server for VSE/ESA**

- Add value to CICS TS for VSE/ESA
- New systems management framework for CICS TS (consists of client and server part)
- Client part of CICS Explorer common for z/OS and z/VSE, server part requires CICS TS and z/VSE V5.1
- *Fulfills SOD in z/VSE V5.1 Preview Announcement (RFA54520), 04/12/2011*

§ **Fast Path to Linux on System z (LFP) in LPAR**

- Allows TCP/IP applications to communicate with TCP/IP stack on Linux w/o using a TCP/IP stack on z/VSE
- LFP in a z/VM guest environment available since z/VSE V4.3 – now LPAR support is added
- LFP in LPAR requires HiperSockets Completion Queue function of zEnterprise
- *Fulfills SOD in zEnterprise Announcement (RFA54727), 07/12/2011*
- *Fulfills SOD in z/VSE V5.1 Announcement (RFA55492), 10/12/2011*

§ **z/VSE database connector for z/VSE applications**

- Allows to utilize a new Call Level Interface (CLI) to advanced database functions
- Flexibility to use a database server on a platform other than z/VSE (for example in a zBX environment)

§ **64-bit I/O processing for applications**

- 64-bit virtual storage can also be used for I/O buffers
- Allows ISVs and customers to exploit 64-bit virtual storage

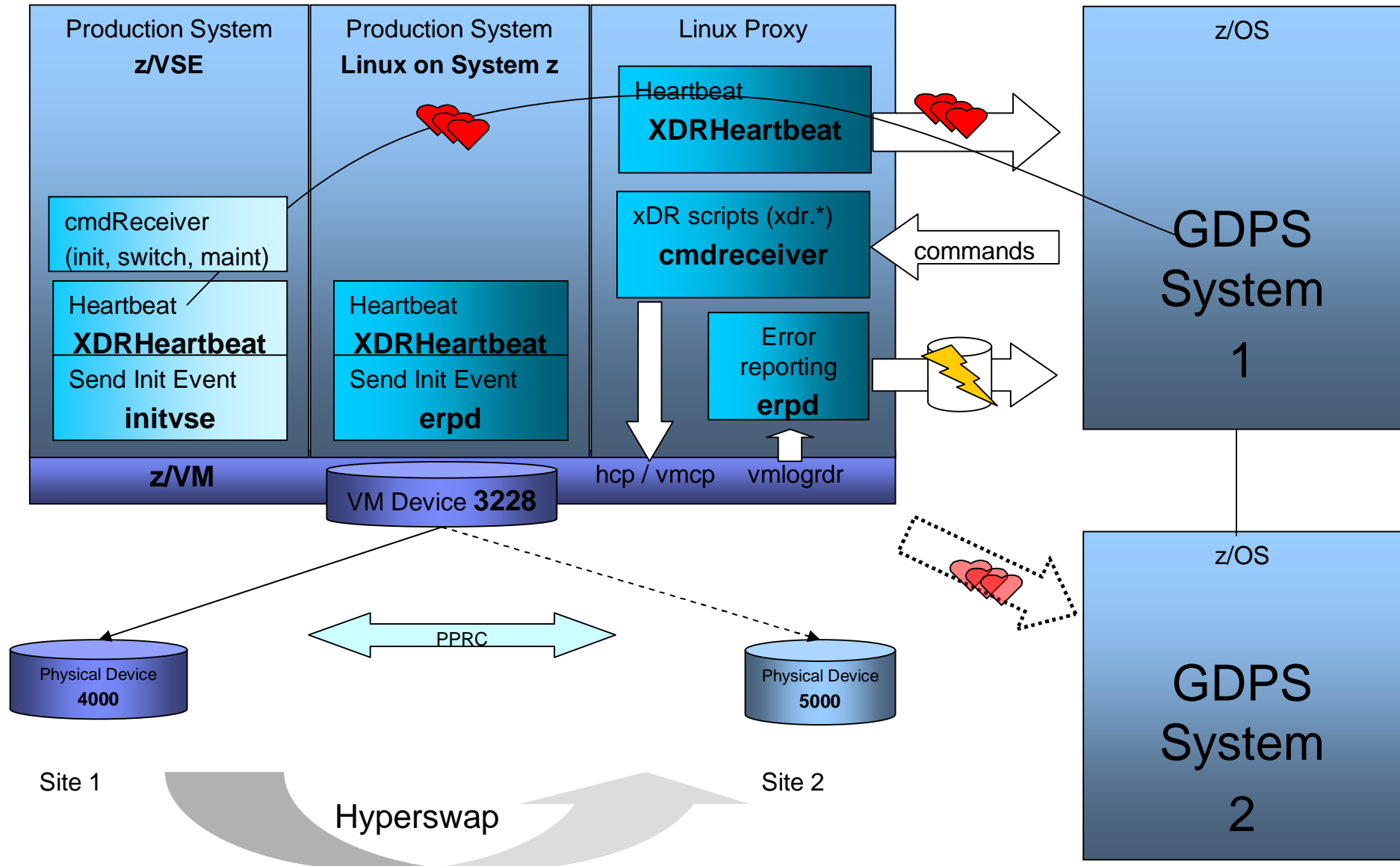
§ **IPv6/VSE Secure Socket Layer (SSL) support**

- Secure TCP/IP data transmission in IPv4 and IPv6 for z/VSE

(*) Planned to be made available via PTF: June 15, 2012.

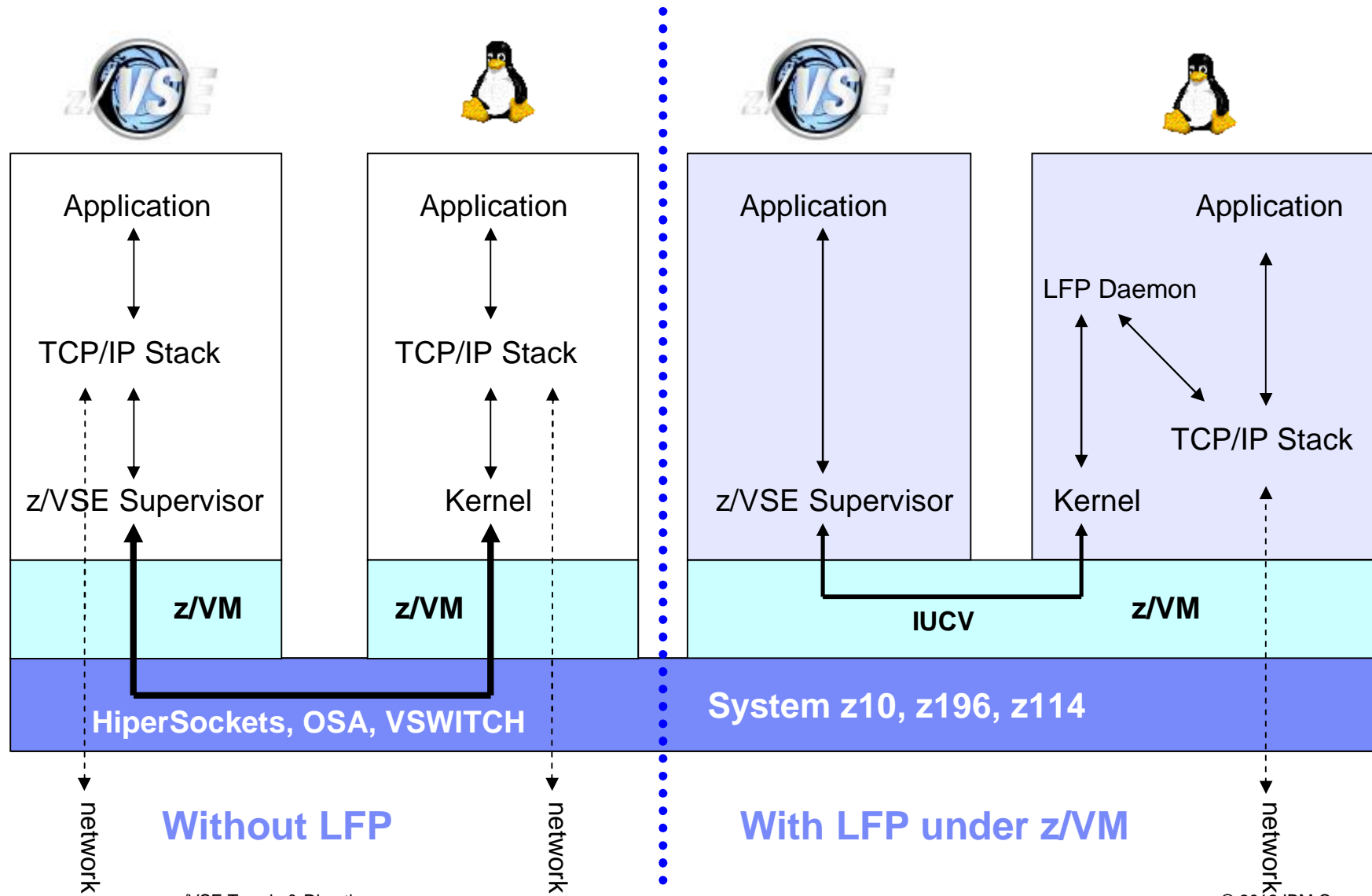
64-bit I/O and IPv6/VSE enhancements PTFs will be made available at a later date.

xDR Support for z/VSE as active guest under z/VM



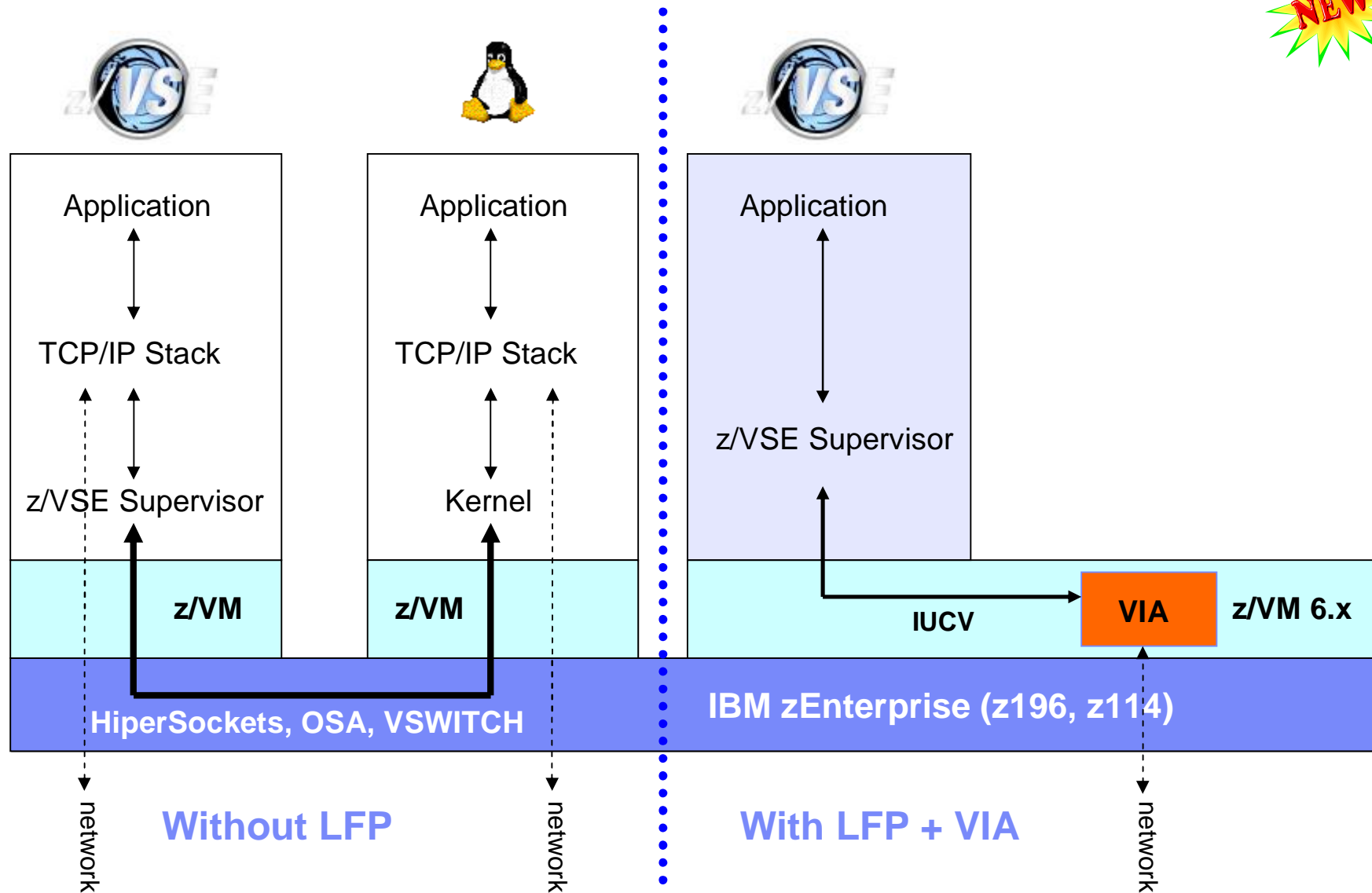
Linux Fast Path in a z/VM environment (z/VSE V4.3 or later)

Faster communication between z/VSE and Linux applications



New: z/VSE z/VM IP Assist (VIA) (z/VSE V5.1 with z/VM V6.x)

With z/VM IP Assist (VIA), no Linux on System z is needed to utilize the LFP advantage

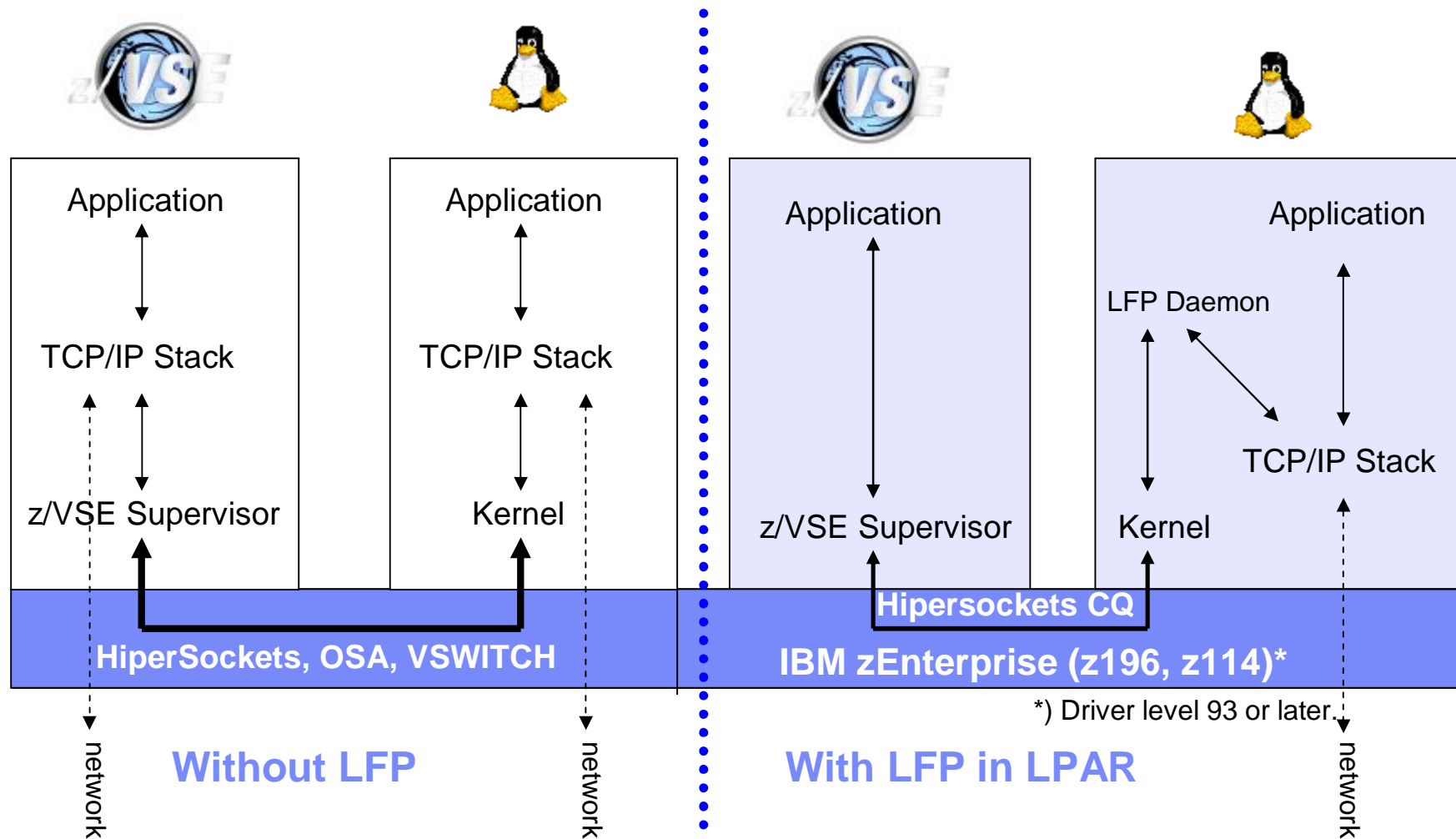


New: Linux Fast Path in an LPAR environment (z/VSE V5.1 + PTFs)

Faster communication between z/VSE and Linux applications



à Exploits the HiperSockets Completion Queue support of IBM zEnterprise (z196, z114)



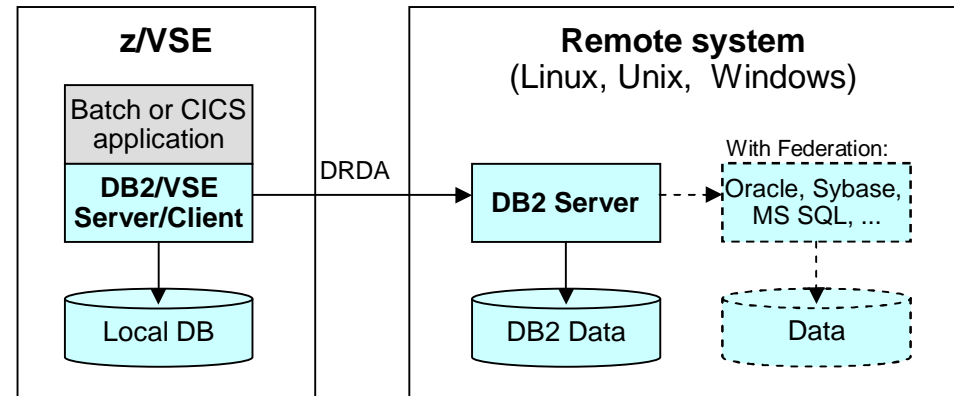
Options for using Databases with z/VSE applications

§ DB2/VSE or DB2/VM Server

- Local database residing in z/VSE or z/VM
- Lacks support of modern SQL functionality
- Quite old SQL level

§ DB2/VSE Client Edition

- Remote database (on Linux, Unix, Windows)
- Communication via DRDA protocol
- Same old SQL level supported as DB2/VSE Server
- Can not use modern SQL functionality provided by DB2 LUW
- Can only access remote DB2 databases
 - Other databases (e.g. MS SQL Server, Oracle, etc) can only be accessed through IBM InfoSphere Federation Server



§ VSAM Redirector

- Primarily used to keep databases in sync with VSAM data
- Also allows migration from VSAM to database

§ **New:** z/VSE Database Call Level Interface

- Allows z/VSE applications to access a relational database on any suitable database server
 - IBM DB2, IBM Informix, Oracle, MS SQL Server, MySQL, etc.
- Utilize advanced database functions and use SQL statements provided by modern database products



z/VSE Database Call Level Interface (DBCLI) - z/VSE V5.1 + PTFs

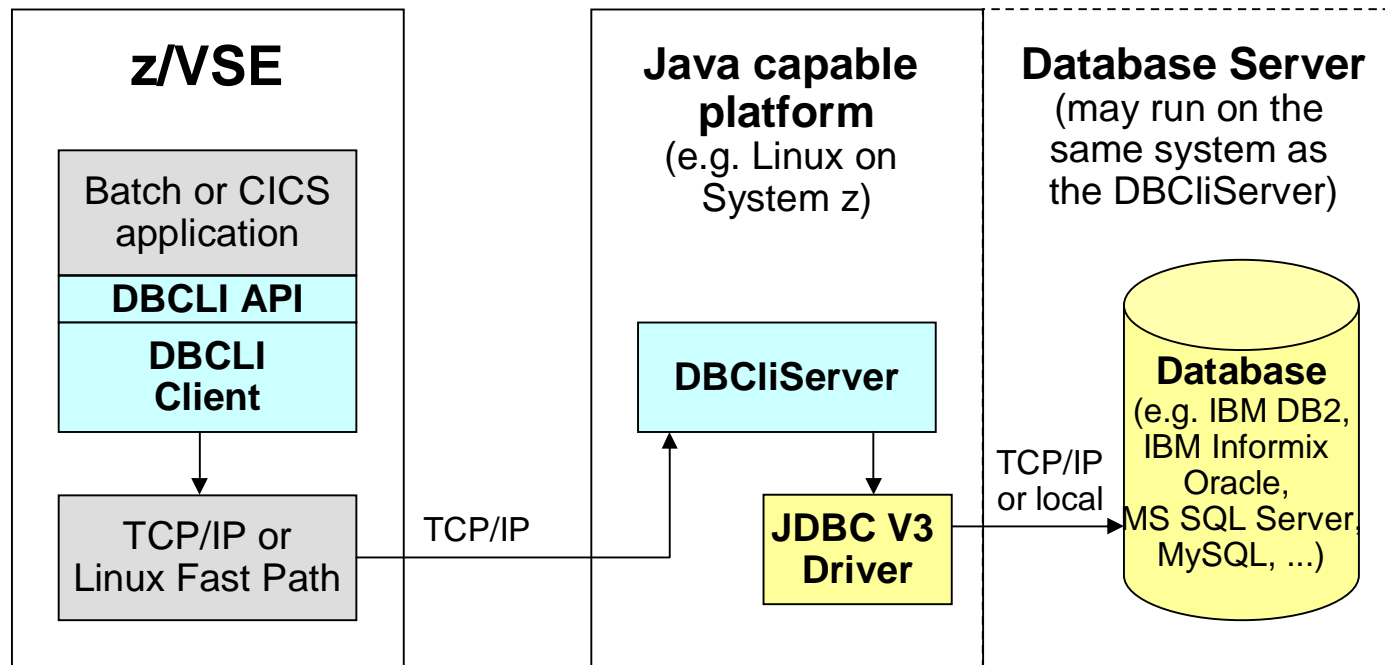
§ **Allows z/VSE applications to access a relational database on any suitable database server**

– IBM DB2, IBM Informix, Oracle, MS SQL Server, MySQL, etc.

à The database product must provide a JDBC driver that supports JDBC V3.0 or later



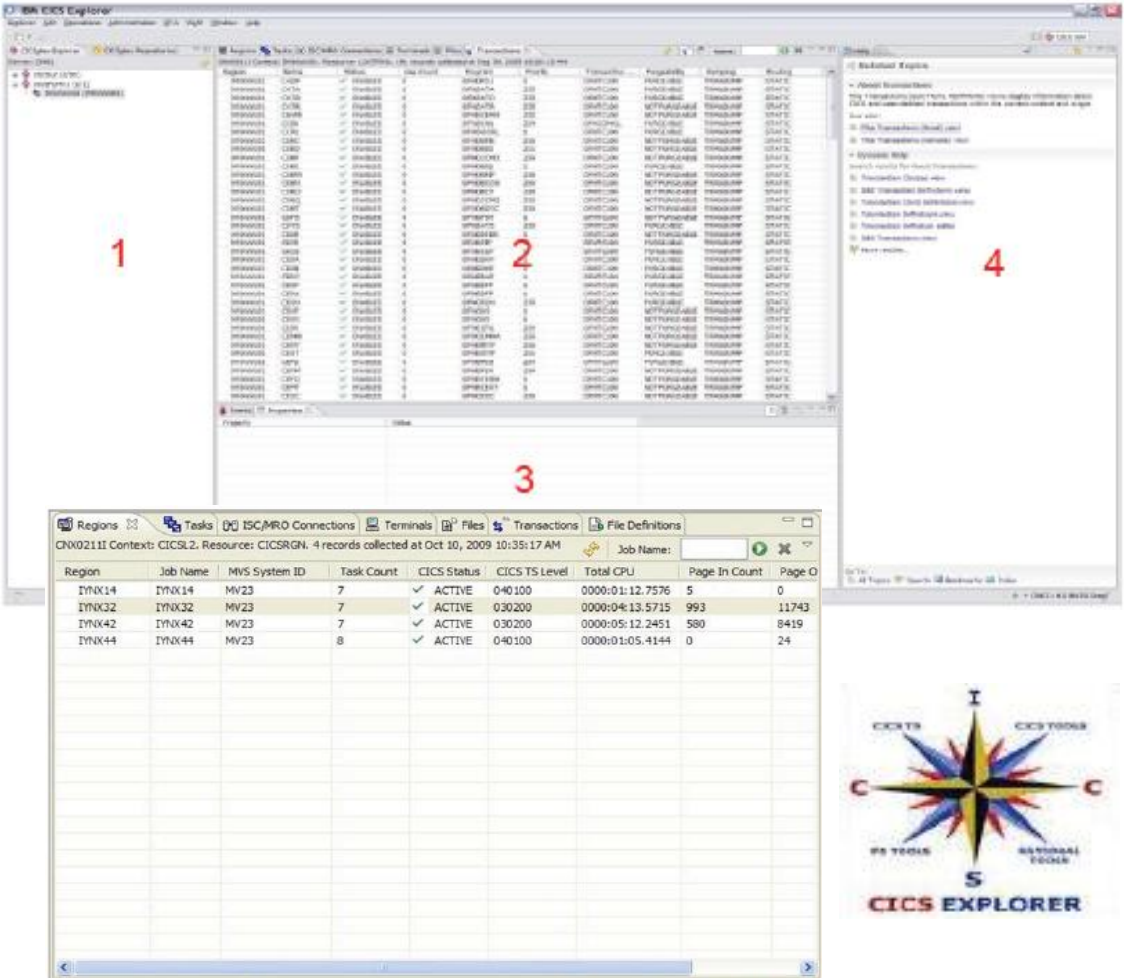
à **Utilize advanced database functions and use SQL statements provided by modern database products**



z/VSE support for IBM CICS Explorer – The “new face of CICS Transaction Server for VSE/ESA”

CICS Explorer

- § New systems management framework for CICS TS
- § Consists of client and server part
- § 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
- § Client part of CICS Explorer common for z/OS and z/VSE
- § Server part requires CICS TS and z/VSE V5.1



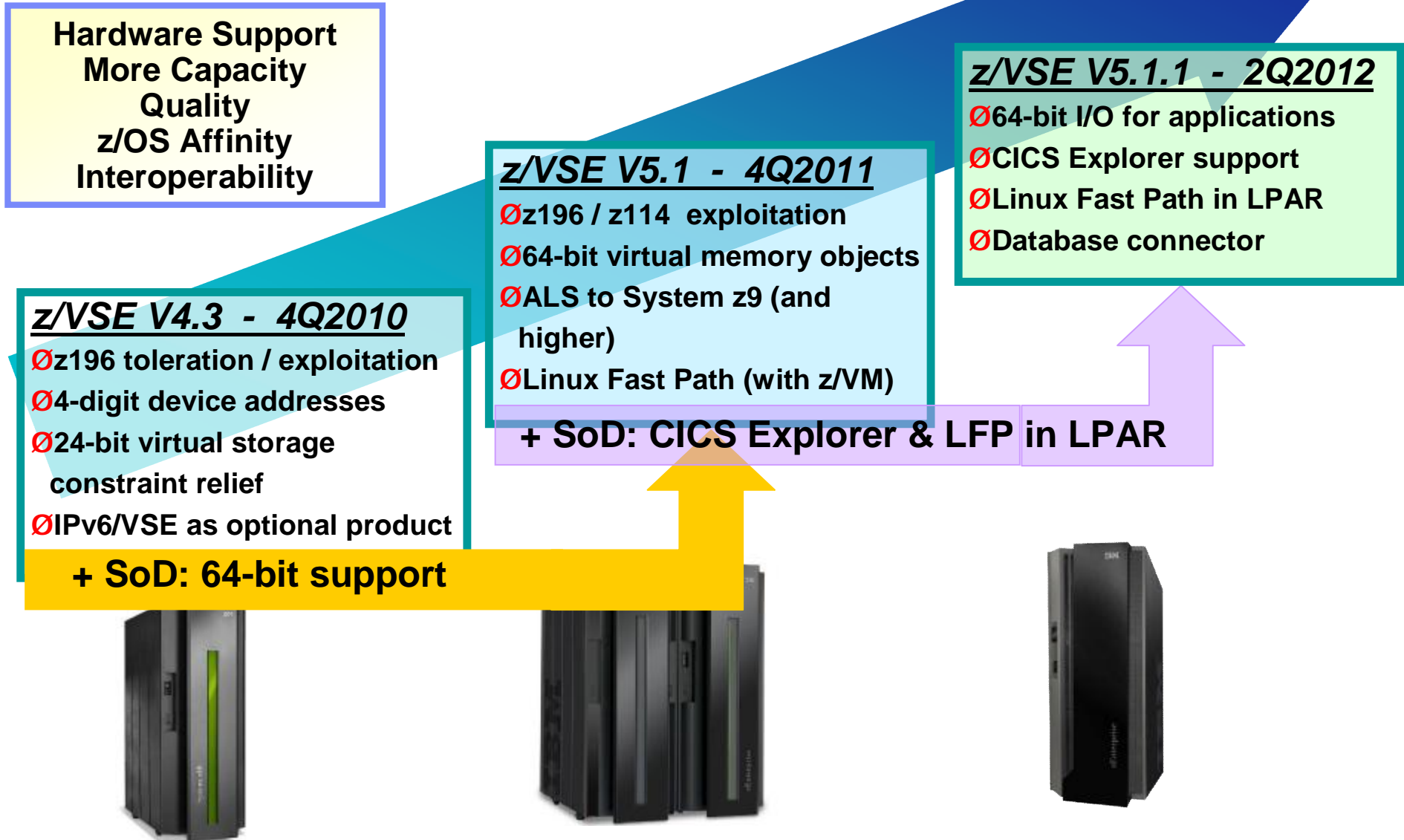
Fulfills Statement of Direction:
 “IBM intends to provide CICS Explorer capabilities for CICS TS for VSE/ESA, to deliver additional value.”

Agenda

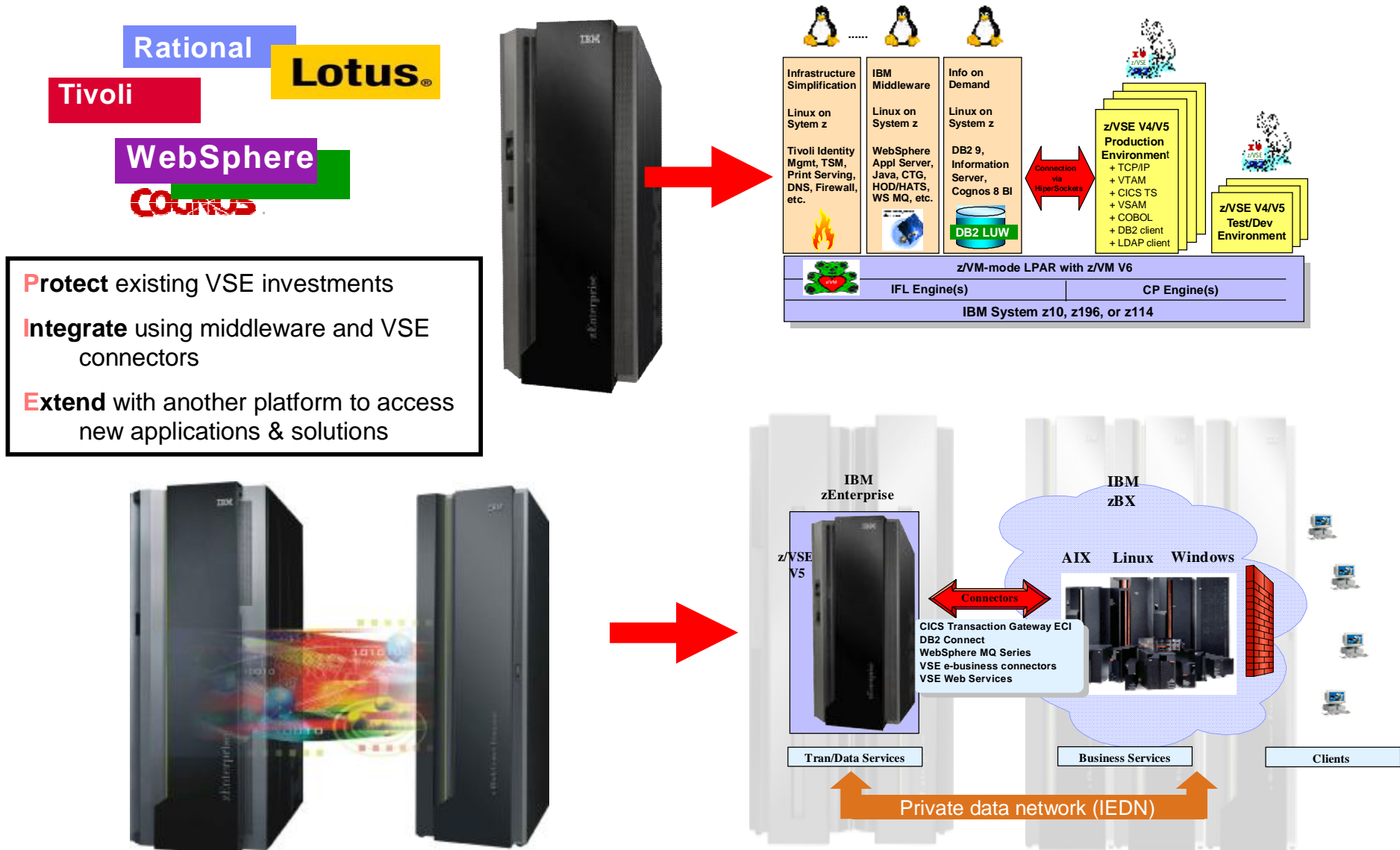
- § **z/VSE Status & Support**
- § **z/VSE Strategy**
- § **z/VSE Modernization Options**
- § **z/VSE Software Pricing**
- § **z/VSE Functional Enhancements**
 - z/VSE V4.3
 - z/VSE V5.1
 - z/VSE V5.1 + PTFs
- § **Wrap-up**



z/VSE continues to demonstrate IBM's commitment



IBM zEnterprise can do IT all - Think inside the Box and/or think zBX !



For more information, please see the z/VSE web site:
<http://www-03.ibm.com/servers/eserver/zseries/zvse/>

The screenshot shows the IBM z/VSE website interface. At the top, there's a navigation bar with 'Home', 'Solutions', 'Services', 'Products', 'Support & downloads', and 'My IBM'. A search bar is also present. Below the navigation, a breadcrumb trail reads 'IBM Systems > Mainframe servers > Operating systems > z/VSE'. The main content area features a large heading 'z/VSE' and a descriptive paragraph: 'z/VSE is designed to help provide robust, cost-effective solutions for customers with a wide range of capacity needs, in most industries, worldwide. z/VSE is built on a heritage of ongoing refinement and innovation that spans four decades. It brings the value of innovative IBM System z and IBM System Storage technology to z/VSE clients.' To the right of this text are links for 'Learn more' (About z/VSE, News, History of z/VSE). Below this is a section titled 'z/VSE V5.1 is available' with a graphic of the z/VSE logo and text stating it's built on a heritage of ongoing refinement and innovation that spans more than four decades. A sub-section 'IBM z/VSE V5.1 - Additional enhancements' lists several key features:

- Support for IBM CICS Explorer - "The new face of CICS Transaction Server for VSE/ESA V1.1"**: CICS Explorer V1.1 capabilities can now be used with CICS TS.
- The Fast Path to Linux on System z function (Linux Fast Path) in a logical partition (LPAR) environment**: Linux Fast Path was introduced with z/VSE V4.3 for use in a z/VM guest environment. New LPAR support is added, which is intended to extend the connectivity options for z/VSE clients. Linux Fast Path in an LPAR environment requires IBM zEnterprise technology with the HyperSockets Completion Queue function.
- 64-bit Input/Output (I/O) processing for applications**: 64-bit virtual addressing for applications was introduced at general availability of z/VSE V5.1. z/VSE V5.1 enhancements add 64-bit I/O processing for applications. With 64-bit I/O processing, clients have the flexibility to also use 64-bit virtual storage for I/O buffers and thus benefit from increased processor storage available with the latest IBM System z servers.
- A z/VSE database connector**: This z/VSE database connector is designed to allow z/VSE applications to access a relational database on any suitable database server. It gives z/VSE clients more flexibility in selecting a database server that runs on a platform other than z/VSE. z/VSE applications can now utilize advanced database functions and use SQL statements provided by modern database products.
- IPv6/VSE V1.1 enhancements**: IPv6/VSE now supports Secure Sockets Layer (SSL) for secure transmission of data to and from remote host systems. Protocols that are supported are HTTPS (HTTP over SSL), FTPS (FTP over SSL), SMTPS (SMTP over SSL), and TN3270E over SSL.

A note at the bottom states: 'Planned availability is June 15, 2012. 64-bit I/O and IPv6/VSE enhancements PTFs will be made available at a later date.' The sidebar on the left contains a 'z/VSE' menu with links to 'About z/VSE', 'How to buy', 'News & announcements', 'Events', 'Solutions', 'Products & components', 'Documentation', 'Service & support', 'Downloads', 'Education', 'Partners', 'FAQ', and 'Contact z/VSE'. Below the sidebar is a 'Related links' section with links to 'Linux on IBM System z', 'z/OS', 'z/VM', and 'IBM Storage'. On the right side of the page, there are several promotional widgets: 'We're here to help' with an 'E-mail us' button, 'Stay informed' with a 'Get the latest news about z/VSE through Twitter' link, 'Mark your calendar' for 'WAVV 2012' (April 13-17, 2012, Covington, Kentucky, USA) with an 'Enroll now' link, and 'Announcing' a new product 'Introducing IBM zEnterprise 114 (z114)' with a 'Learn more' link.

100 Years of IBM – 47 Years of VSE



Computing Tabulating and Recording Comp. (1911)



International Business Machines (1924)



IBM Logo 1956



IBM Logo since 1972



IBM Centennial Logo

