z/VSE
Trends & Directions

zDG01

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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*
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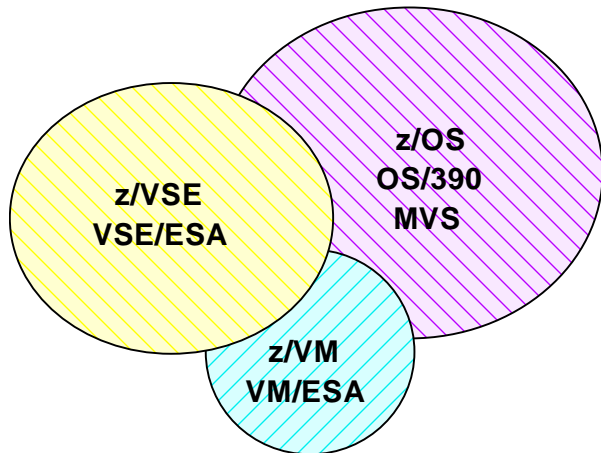
z/VSE Trends & Directions

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 Trends & Directions

Operating Systems on IBM System z

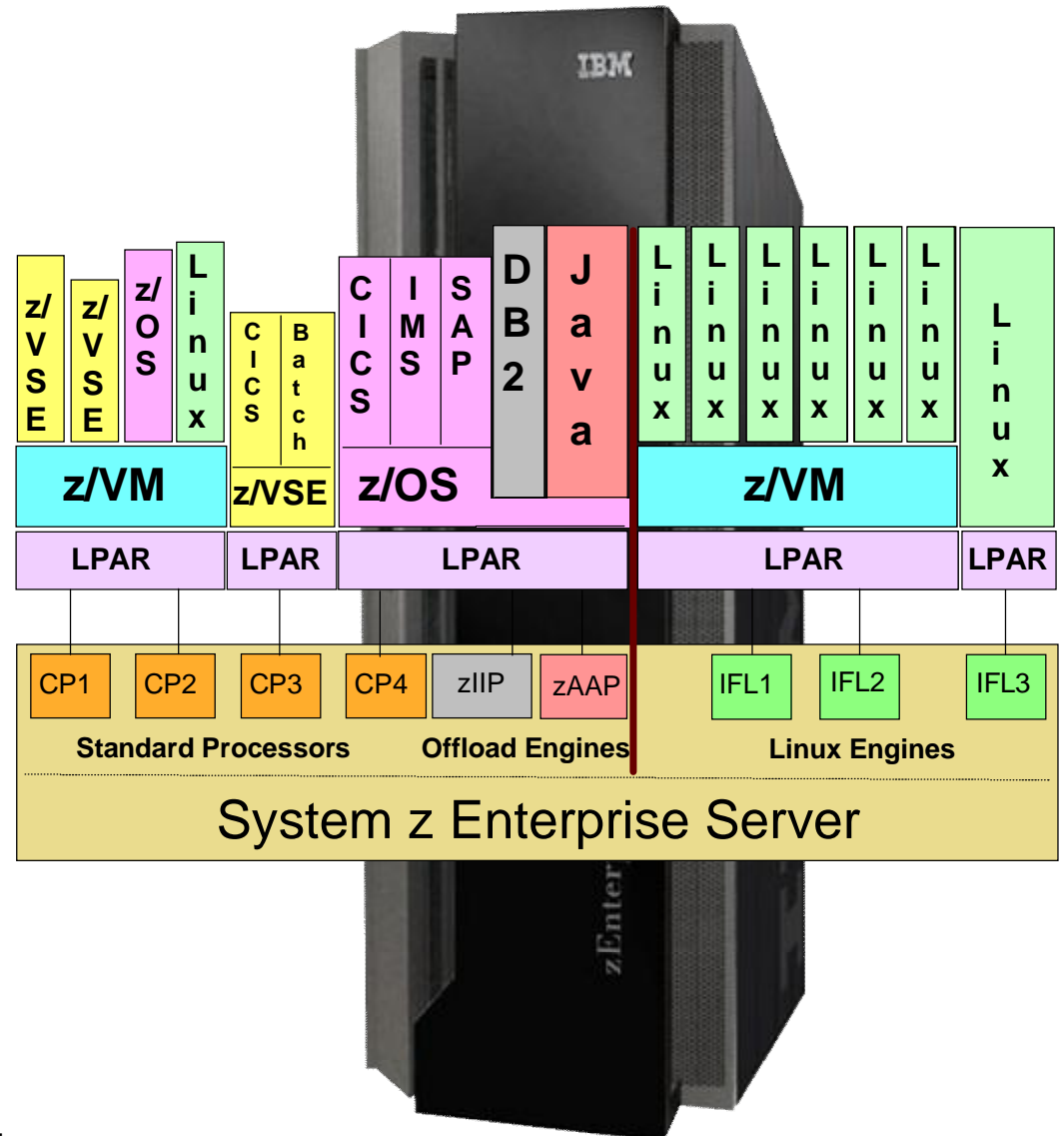§ **33% of worldwide traditional mainframe operating system installs are VSE***

§ **VSE population is 40% in US, 40% in Europe, 20% in RoW**

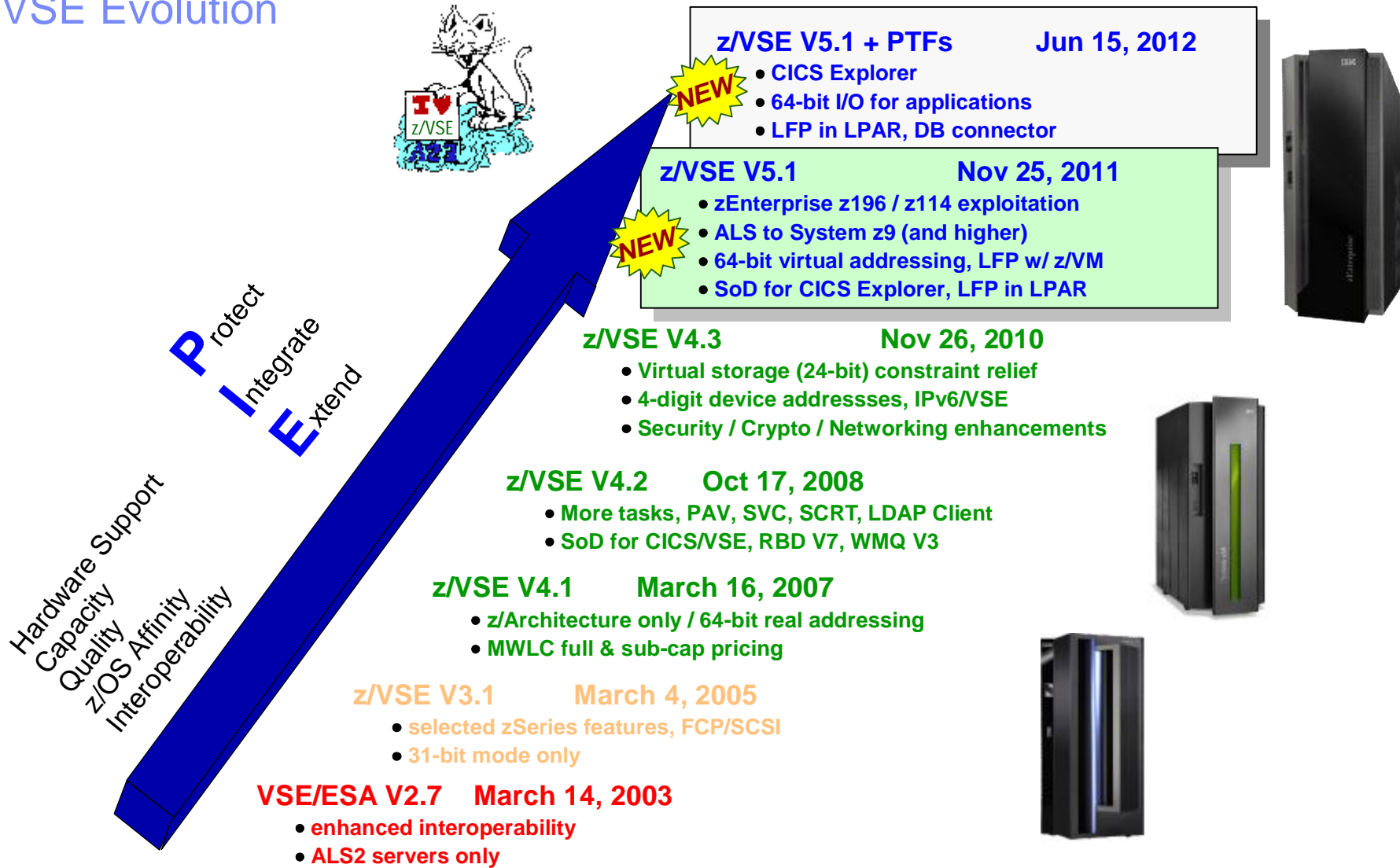§ **Worldwide 50% run VSE under z/VM, in Europe 90+% are VSE under z/VM**

§ **IFLs play an important role in VSE's strategy**

§ **zIIP/zAAP/ICF have no meaning to VSE**

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

z/VSE Trends & Directions

z/VSE Evolution

z/VSE V5.1 + PTFs   Jun 15, 2012
- CICS Explorer
- 64-bit I/O for applications
- LFP in LPAR, DB connector

z/VSE V5.1   Nov 25, 2011
- zEnterprise z196 / z114 exploitation
- ALS to System z9 (and higher)
- 64-bit virtual addressing, LFP w/ z/VM
- SoD for CICS Explorer, LFP in LPAR

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

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

Protect **I**ntegrate **E**xtend

Hardware Support
Capacity
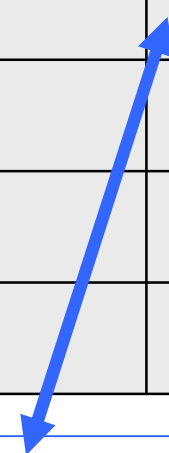Quality
z/OS Affinity
Interoperability

NEW

NEW

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 2012)

VSE Version and Release	Marketed	Supported	End of Support
z/VSE V5.1	a	a	tbd
z/VSE V4.3	r	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 Trends & Directions

z/VSE Support for IBM Mainframe Servers

IBM Servers	z/VSE V5.1	z/VSE V4.3	z/VSE V4.2 (soon out of service)	z/VSE V4.1 (out of service)
IBM zEnterprise EC12	a	a	a	r
IBM zEnterprise 196 & 114	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.

§ 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 Trends & Directions

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

The world's fastest and most scalable system:
IBM zEnterprise™ 196
IBM zEnterprise™ 114
IBM zEnterprise™ EC12

§ 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

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

§ 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 70 BIPS

§ 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 Trends & Directions

z/VSE Support for IBM zEnterprise EC12 (zEC12)

§ z/VSE Release Support

– z/VSE supports the zEC12 with z/VSE V4.2, V4.3 and V5.1

- No PTFs are required to run z/VSE on zEC12
- For IOCP, EREP and HLASM PTFs, see PSP (subset 2827/ZVSE of 2827DEVICE)

§ Configurable Crypto Express4s – new with zEC12

– z/VSE toleration PTF required to use Crypto Express4s

- Toleration PTF (DY47414) will be provided for z/VSE V5.1 only

– Crypto Express4s supported with existing z/VSE cryptographic functionality

- Supported modes: (CCA) coprocessor and accelerator
- PKCS #11 (EP11) coprocessor not supported

§ OSA-Express4s 1000BASE-T – new with zEC12
– No z/VSE PTF required
– 1000BASE-T supported with existing z/VSE functionality

§ SCRT – Subcapacity Pricing
– z/VSE 4.2 requires DY47111 (same as for z196, z114)

§ z/VSE Releases with EoS
– See z/VSE home page

z/VSE Trends & Directions

Overview of z/VSE Support for IBM zEnterprise 196 / 114
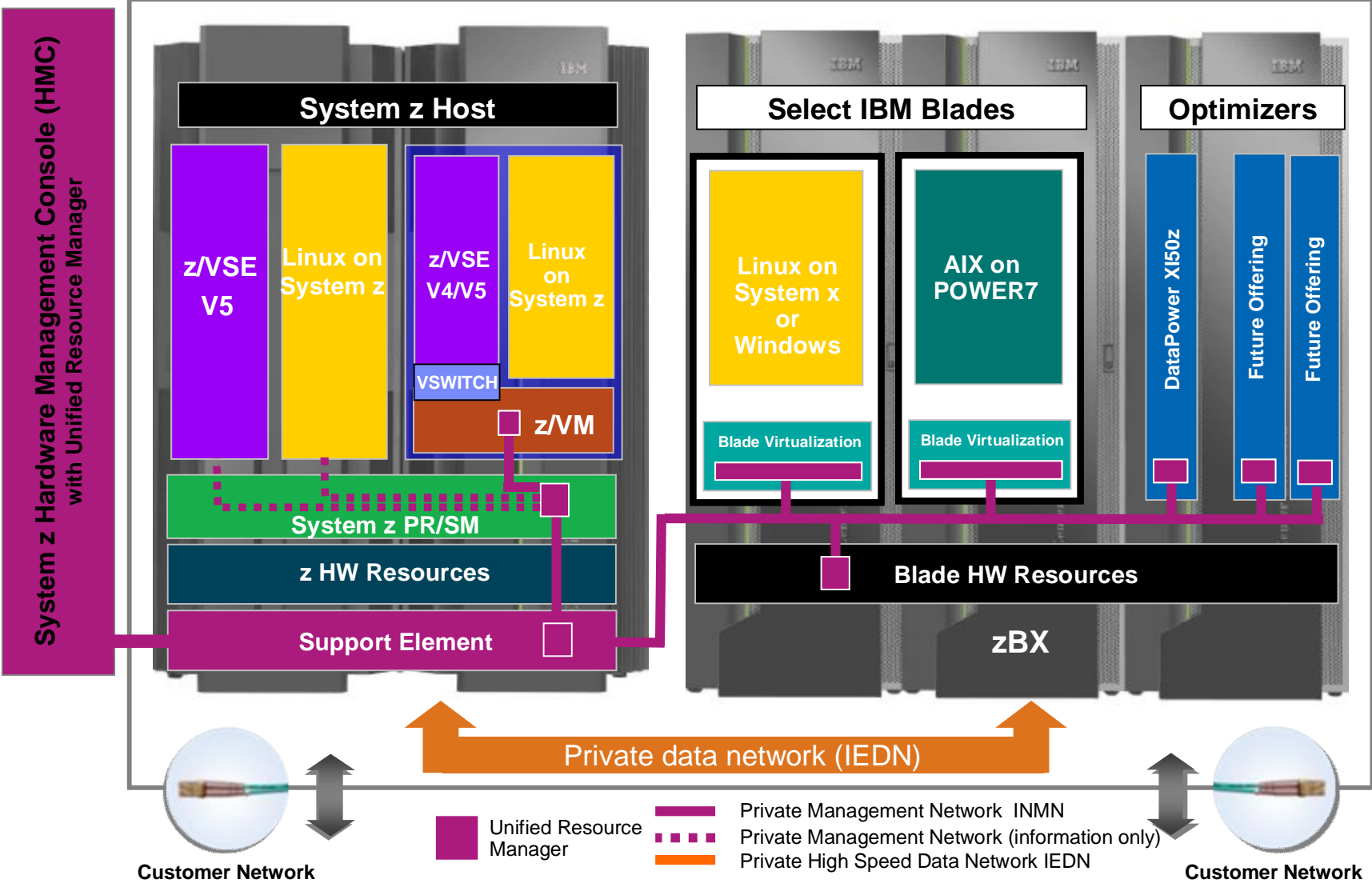
§ zEnterprise compatibility

- **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
    (exclusive to the high-end zEnterprise, ie. z196 and zEC12)

- **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

System z Hardware Management Console (HMC)
with Unified Resource Manager

System z Host

z/VSE V5

Linux on System z

z/VSE V4/V5

Linux on System z

VSWITCH

z/VM

System z PR/SM

z HW Resources

Support Element

Select IBM Blades

Linux on System x or Windows

AIX on POWER7

Blade Virtualization

Blade Virtualization

Optimizers

DataPower XI50z

Future Offering

Future Offering

Blade HW Resources

zBX

Private data network (IEDN)

Customer Network

Customer Network

Unified Resource Manager

Private Management Network INMN

Private Management Network (information only)

Private High Speed Data Network IEDN

z/VSE Trends & Directions

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Agenda

- § **z/VSE Status & Support**

→ § **z/VSE Strategy**

- § **z/VSE Modernization Options**

- § **z/VSE Software Pricing**

- § **z/VSE Functional Enhancements**
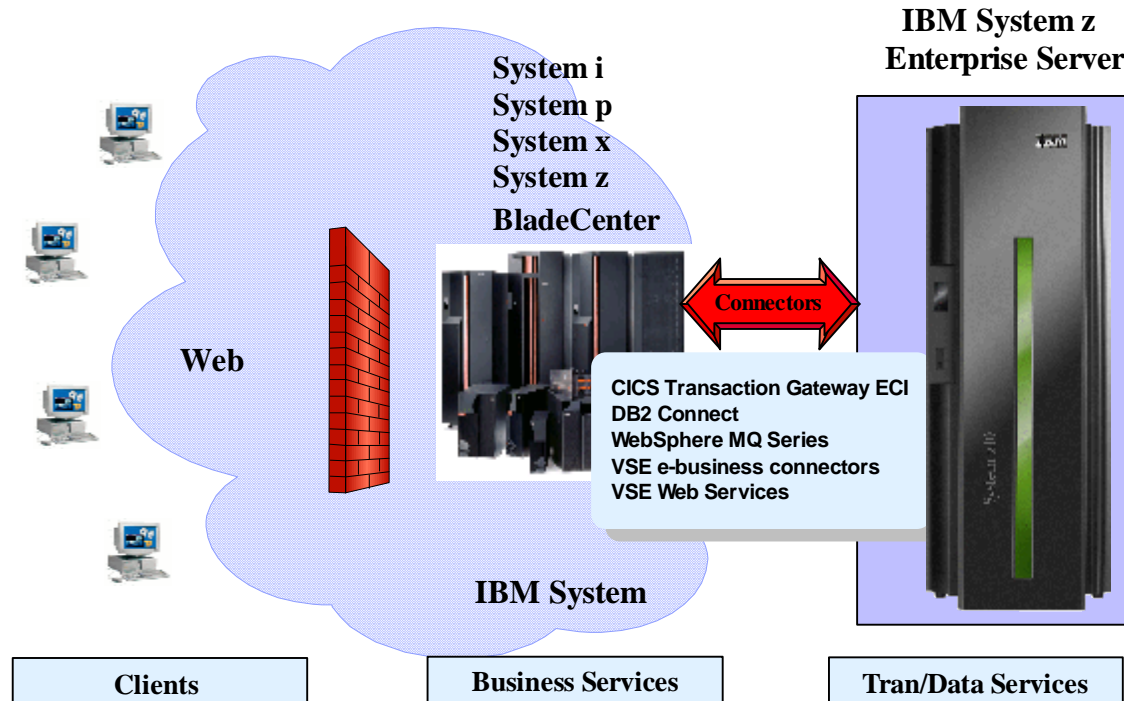 - z/VSE V4.3
  - z/VSE V5.1
  - z/VSE V5.1 + PTFs

- § **Wrap-up**

z/VSE Strategy - Invented in Year 2000

alias

§ 3-tier Strategy

§ **Hybrid Strategy**

§ Connector Strategy

§ Migration Strategy

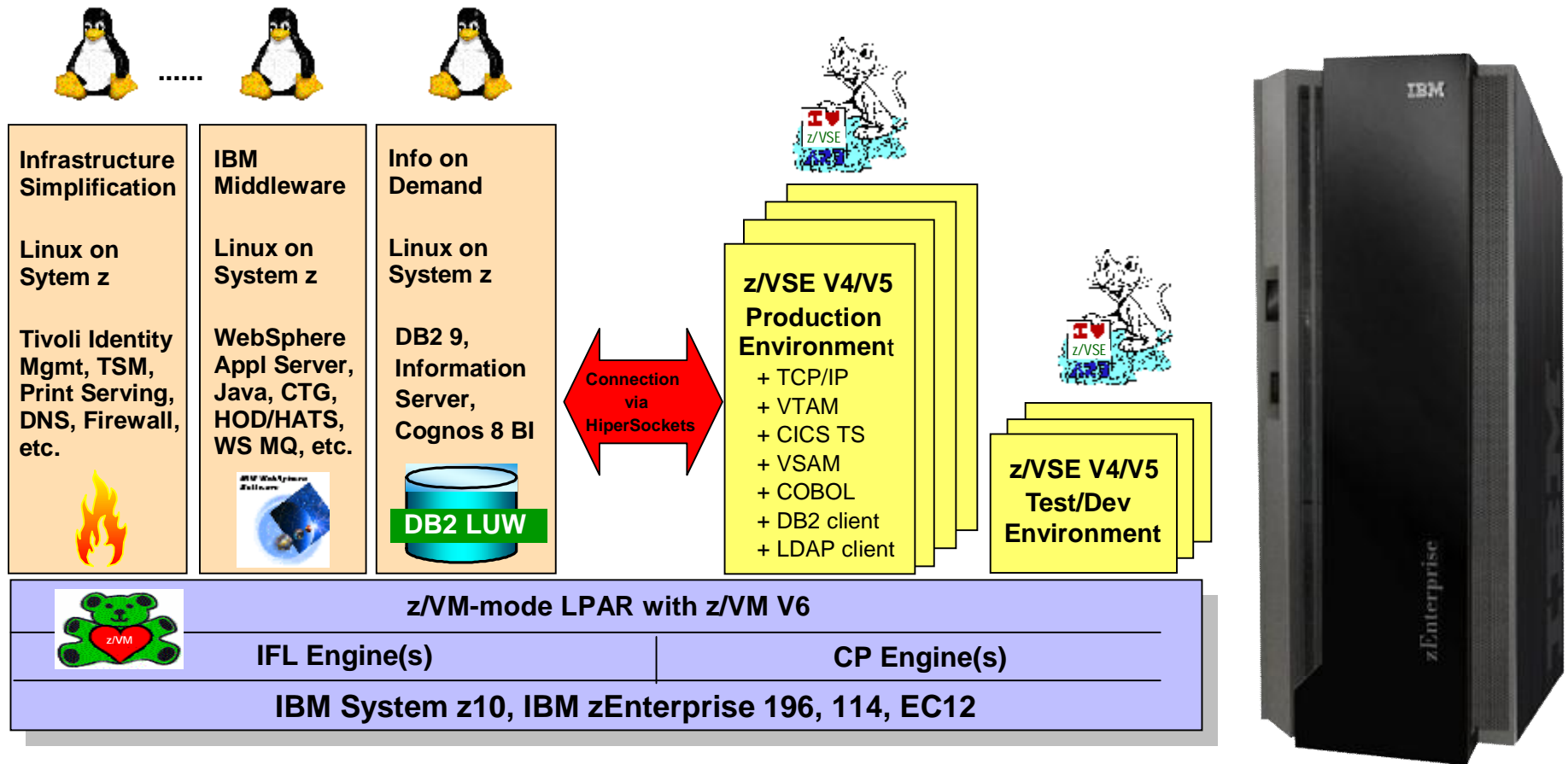§ Coexistence Strategy

§ Linux Surround Strategy

§ **PIE Strategy**

IBM System z Enterprise Server

System i
System p
System x
System z
BladeCenter

Web

Connectors

CICS Transaction Gateway ECI
DB2 Connect
WebSphere MQ Series
VSE e-business connectors
VSE Web Services

IBM System

Clients

Business Services

Tran/Data Services

Protect existing VSE investments

Integrate using middleware and VSE connectors

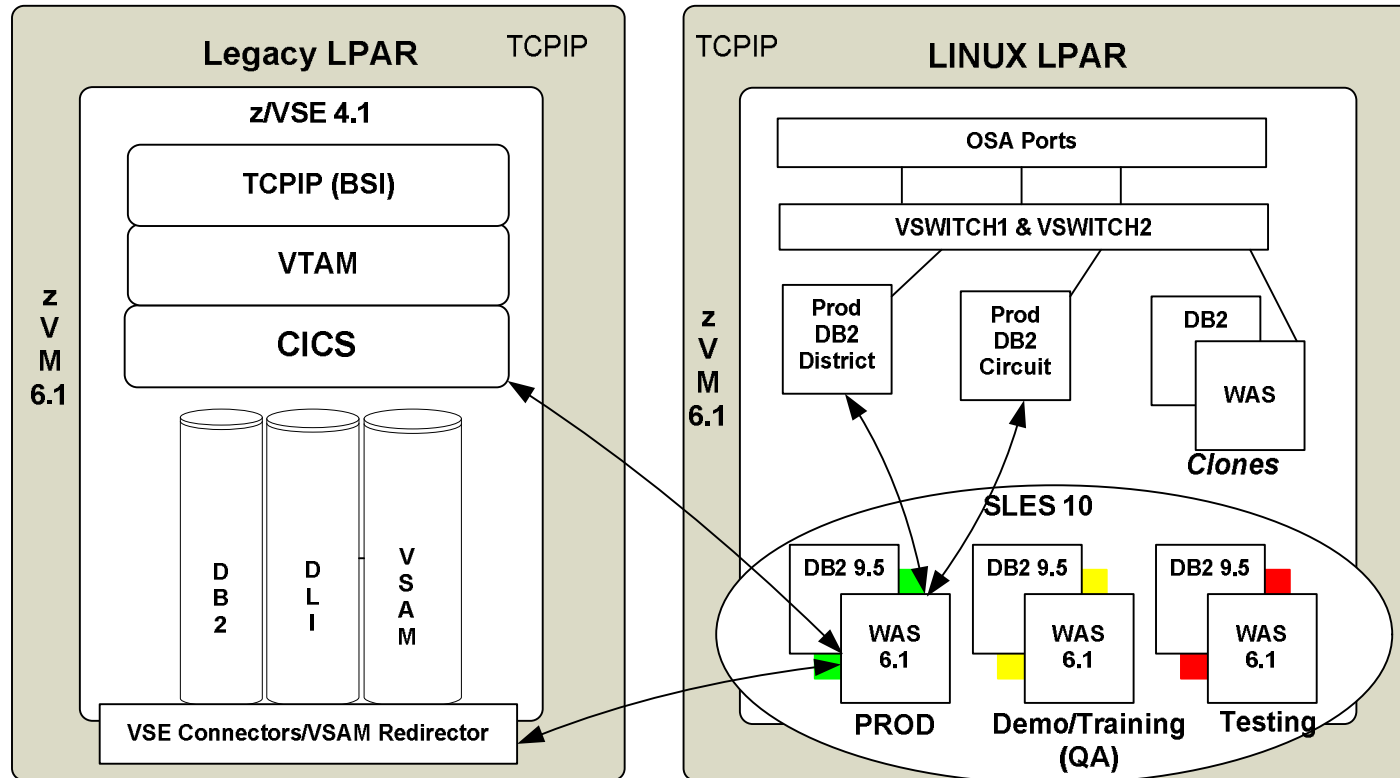**E**xtend with another platform to access new applications & solutions

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

Protect existing VSE investments

Integrate using middleware and VSE connectors

Extend with Linux on IBM System z technology & solutions

Infrastructure Simplification

Linux on Sytem z

Tivoli Identity Mgmt, TSM, Print Serving, DNS, Firewall, etc.

IBM Middleware

Linux on System z

WebSphere Appl Server, Java, CTG, HOD/HATS, WS MQ, etc.

Info on Demand

Linux on System z

DB2 9, Information Server, Cognos 8 BI

DB2 LUW

Connection via HiperSockets

z/VSE V4/V5 Production Environment
+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2 client
+ LDAP client

z/VSE V4/V5 Test/Dev Environment

z/VM-mode LPAR with z/VM V6

IFL Engine(s) | **CP Engine(s)**

IBM System z10, IBM zEnterprise 196, 114, EC12

Customer Example: Supreme Court of Virginia

Legacy LPAR TCPIP

z/VSE 4.1

TCPIP (BSI)

VTAM

CICS

z V M 6.1

DB 2

D L I

V S A M

VSE Connectors/VSAM Redirector

TCPIP **LINUX LPAR**

OSA Ports

VSWITCH1 & VSWITCH2

z V M 6.1

Prod DB2 District

Prod DB2 Circuit

DB2

WAS

Clones

SLES 10

DB2 9.5

WAS 6.1

PROD

DB2 9.5

WAS 6.1

Demo/Training (QA)

DB2 9.5

WAS 6.1

Testing

– 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 appls

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**

IBM

zEnterprise

IBM

zBX

z/VSE

V5

AIX Linux Windows

Connectors

CICS Transaction Gateway ECI
DB2 Connect
WebSphere MQ Series
VSE e-business connectors
VSE Web Services

Tran/Data Services

Business Services

Clients

Private data network (IEDN)

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 Trends & Directions

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

z/VSE Trends & Directions

The No1 scenario, worldwide: DB2 LUW for z/VSE Customers
Data consolidation & data warehouse solutions with DB2 UDB on System z

Linux on System z
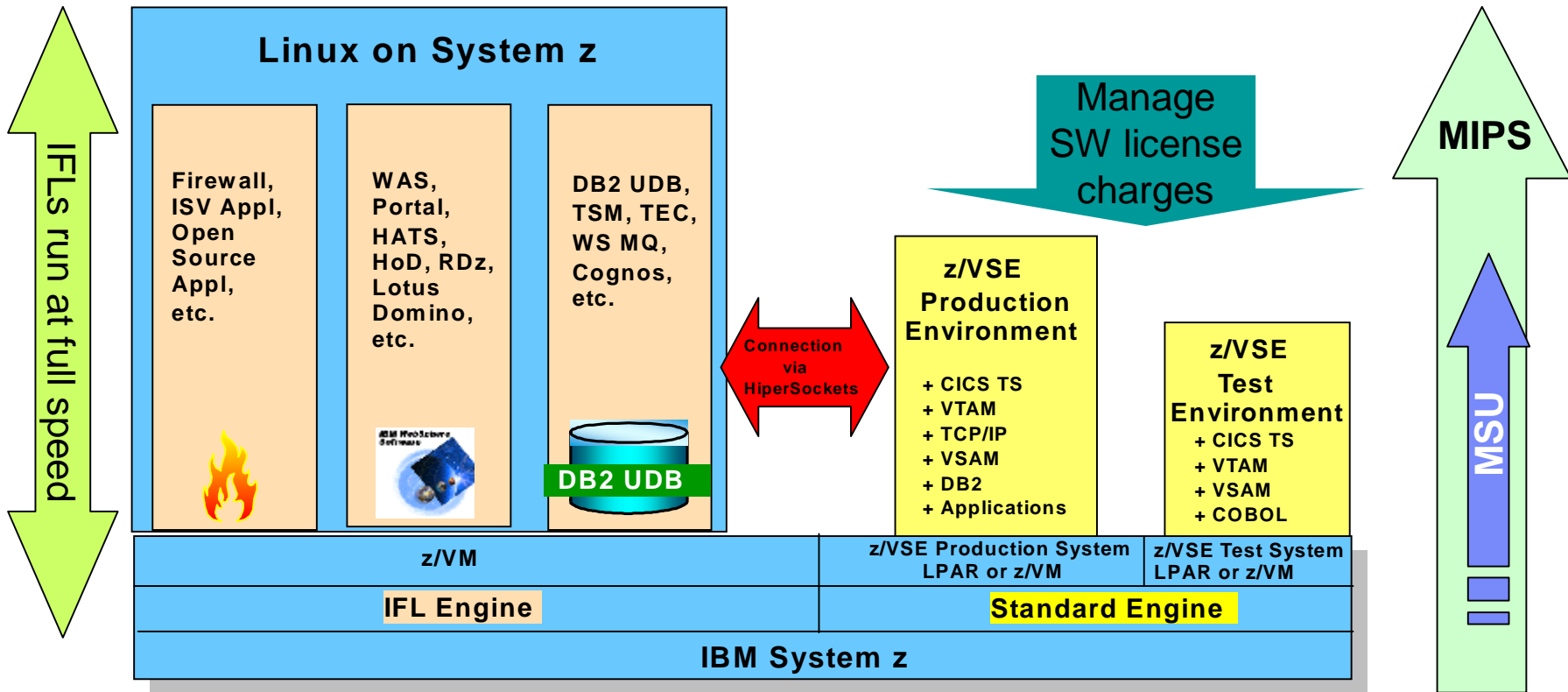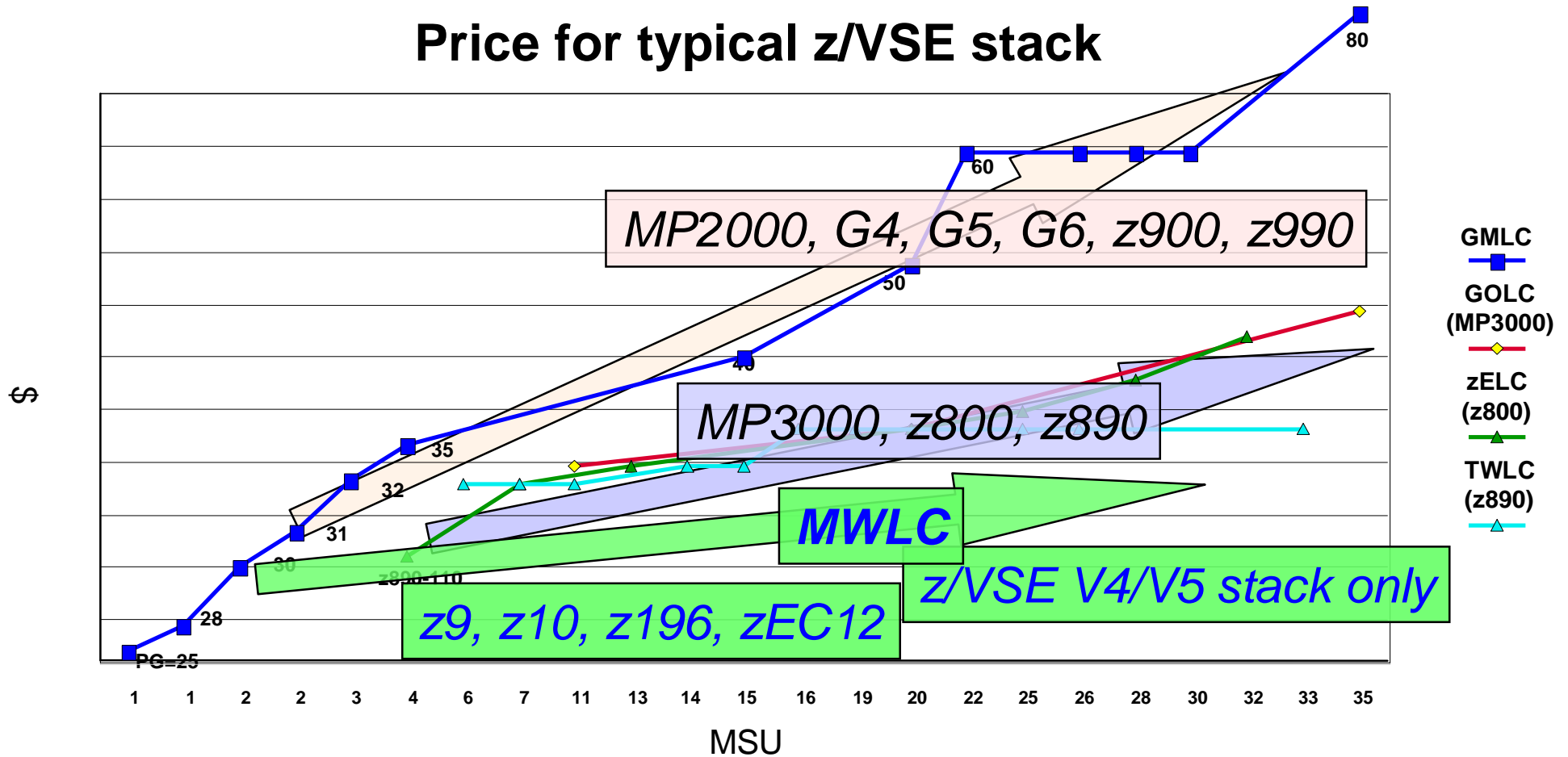
Cognos

DB2 UDB (64-bit)

DB2 UDB

DB2 VSE/VM

VSAM

Connection via HiperSockets

z/VSE Production Environment

+ CICS
+ TCP/IP
+ VSAM
+ COBOL
+ DB2 Client
+ VSAM Redir.

z/VSE Test Environment

+ CICS
+ VSAM
+ COBOL

LPAR or z/VM	z/VSE Production System LPAR or z/VM	z/VSE Test System LPAR or z/VM
IFL Engine	Standard Engine	
IBM System z		

z/VSE Trends & Directions
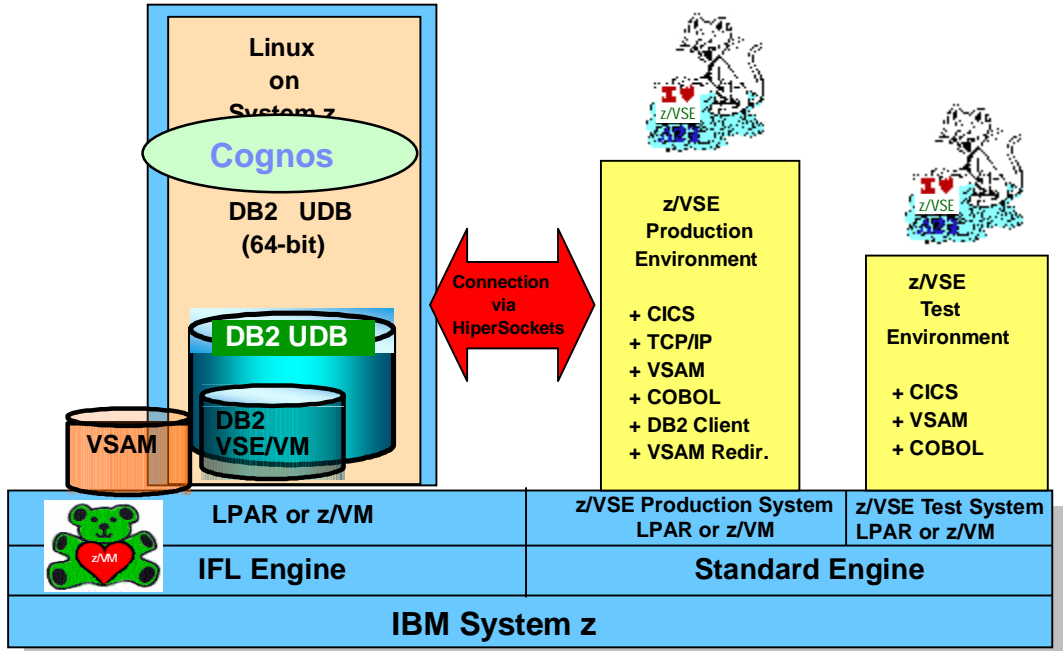
Evolving usage scenario: Backup / Restore Concept for z/VSE
Integrate z/VSE with TSM on Linux on System z

z/VSE Trends & Directions
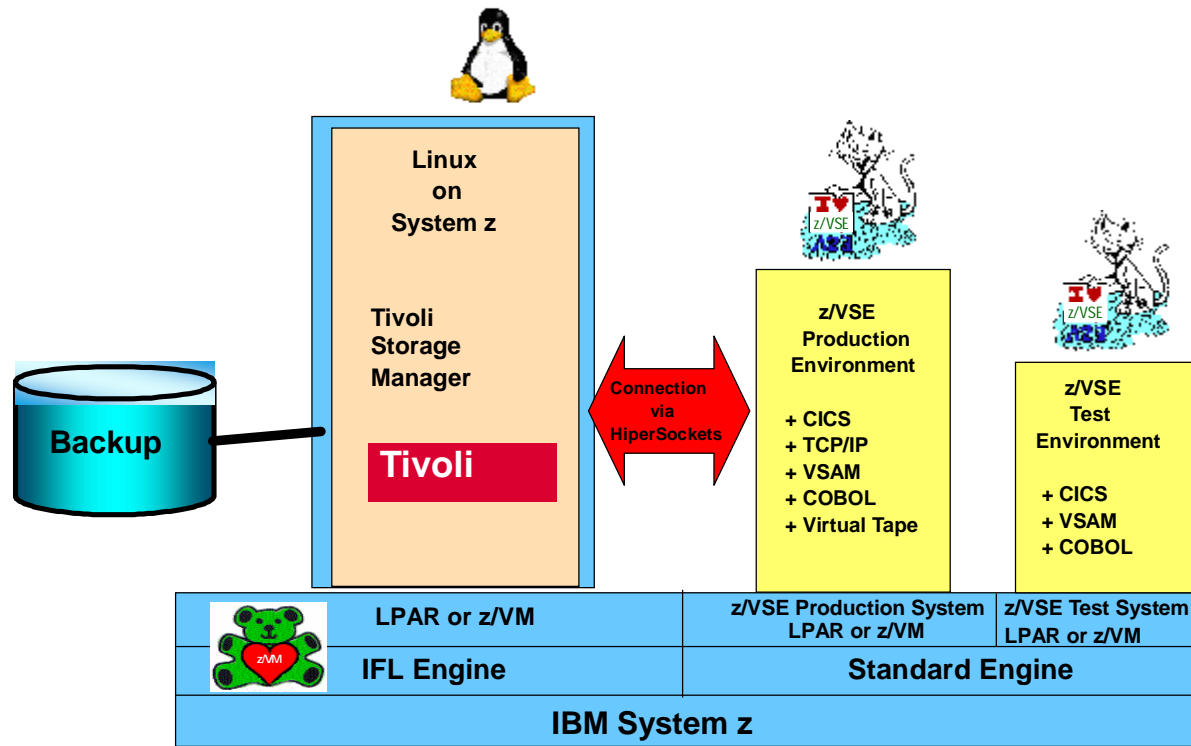
Combine the Scenarios, Manage Software Cost

Protect existing z/VSE investments

Integrate using middleware and z/VSE connectors

Extend with Linux technology and new solutions

IFLs run at full speed

Linux on System z

Firewall, ISV Appl, Open Source Appl, etc.

WAS, Portal, HATS, HoD, RDz, Lotus Domino, etc.

DB2 UDB, TSM, TEC, WS MQ, Cognos, etc.

DB2 UDB

Connection via HiperSockets

Manage SW license charges

MIPS

MSU

z/VSE Production Environment
+ CICS TS
+ VTAM
+ TCP/IP
+ VSAM
+ DB2
+ Applications

z/VSE Test Environment
+ CICS TS
+ VTAM
+ VSAM
+ COBOL

z/VM

z/VSE Production System LPAR or z/VM

z/VSE Test System LPAR or z/VM

IFL Engine

Standard Engine

IBM System z

z/VSE Trends & Directions

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

Supported as native port

Applications not certified on LoZ can be run on AIX blades

System z Hardware Management Console z(HMC) with Unified Resource Manager

System z Host

z/OS z/TPF z/VSE

Oracle DB and FMW

Oracle EBS Mid-Tier

Oracle DB and FMW

Linux

Linux

Linux

z/VM

System z PR/SM

z HW Resources

Support Element

IBM Power7 Blades

Oracle Enterprise Manager

Oracle supported app

Oracle supported app

Oracle supported app

AIX

AIX

AIX

AIX

Power

Power

PowerVM

PowerVM

Blade HW Resources

zBX - **Optional Factory-Packaged Blades and Accelerators**

Private Data Network

Customer Network

Customer Network

Ensemble Management Firmware

Private Management Network

Private High Speed Data Network

z/VSE Trends & Directions

Agenda

§ **z/VSE Status & Support**

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§ **z/VSE Modernization Options**

→ § **z/VSE Software Pricing**

§ **z/VSE Functional Enhancements**
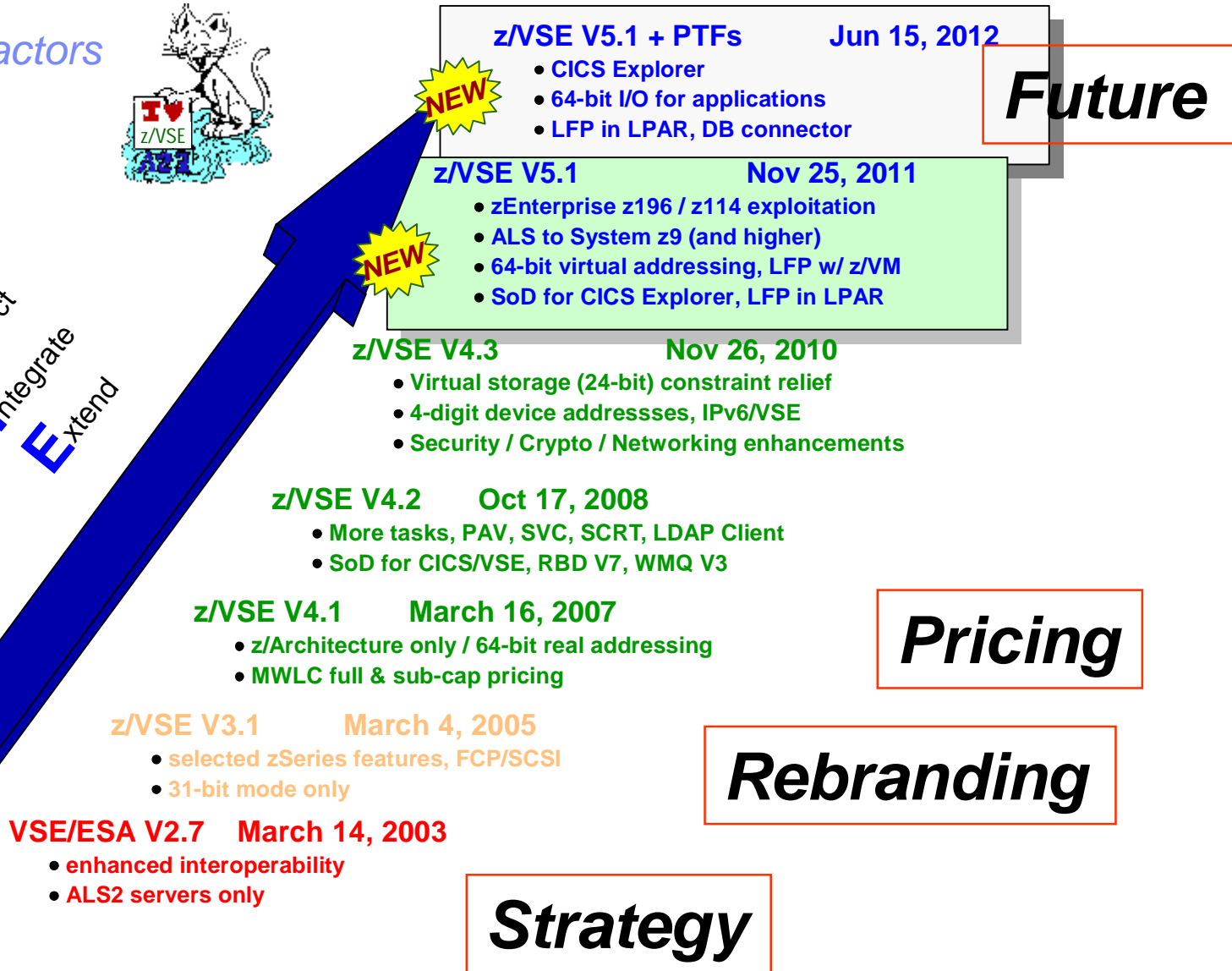 - **z/VSE V4.3**
  - **z/VSE V5.1**
  - **z/VSE V5.1 + PTFs**

§ **Wrap-up**

MWLC – Midrange Workload License Charge on z9, z10, z196, and zEC12

Price for typical z/VSE stack

MP2000, G4, G5, G6, z900, z990

MP3000, z800, z890

MWLC

z/VSE V4/V5 stack only

z9, z10, z196, zEC12

GMLC

GOLC (MP3000)

zELC (z800)

TWLC (z890)

$

MSU

§ *"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

MP2000, G4, G5, G6, z900, z990

MP3000, z800, z890

z9, z10, z196, zEC12

z890-110

z114

GMLC

GOLC
(MP3000)

zELC
(z800)

TWLC
(z890)

MWLC
(z9/10/196/EC12)

AEWLC
(z114)

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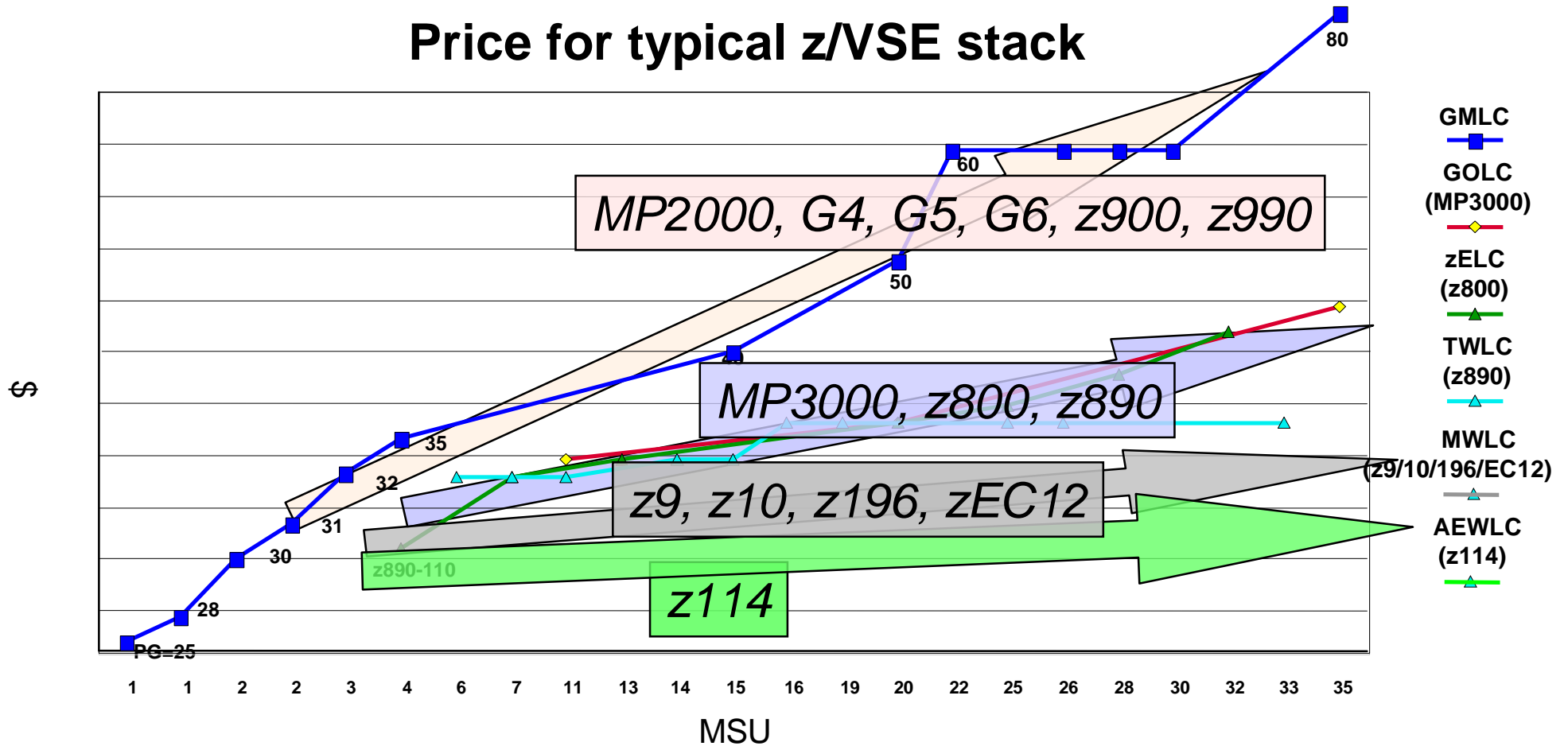
Typical z/VSE stack consists of z/VSE Operating System, LE, CICS TS, VTAM, TCP/IP, DB2

z/VSE Trends & Directions

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)
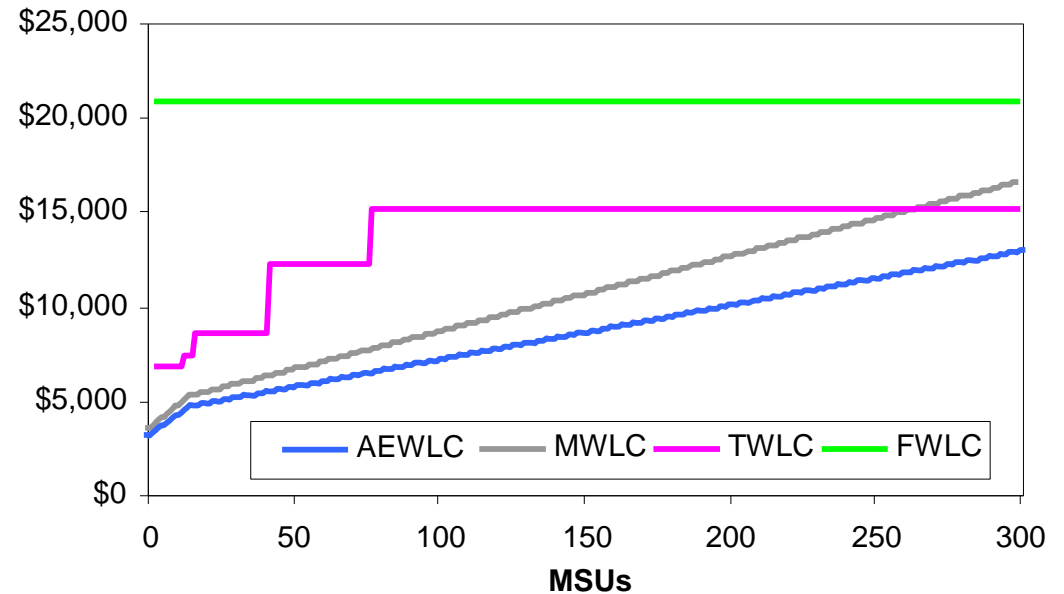
§ **Additional price/performance through sub-capacity option**
  – Some hardware footprint **consolidations** more attractive now
  – Presence of z/VSE V3 or VSE/ESA™ forces full-capacity pricing
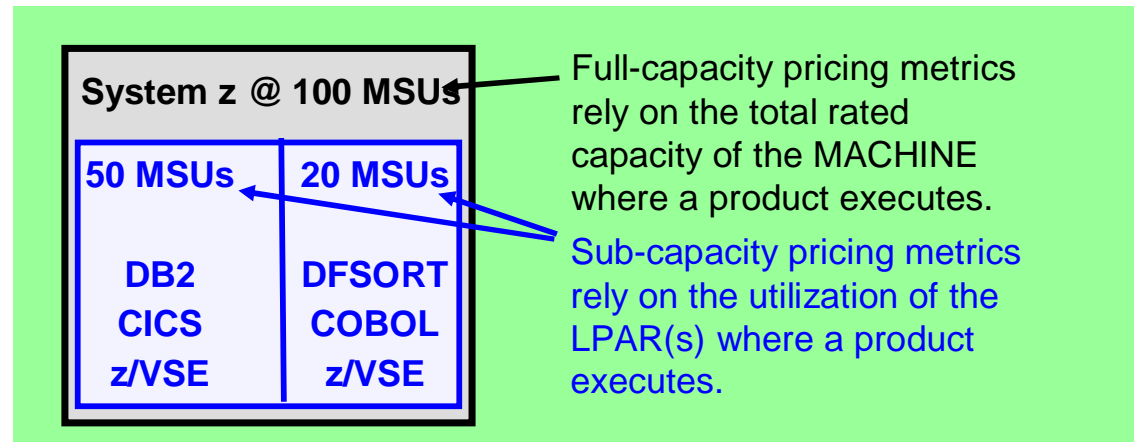
(*) z9 BC A01, z10 BC A01, and z114-A01 are priced zELC.

System z @ 100 MSUs

| 50 MSUs | 20 MSUs |
| DB2 CICS z/VSE | DFSORT COBOL z/VSE |

Full-capacity pricing metrics rely on the total rated capacity of the MACHINE where a product executes.

Sub-capacity pricing metrics rely on the utilization of the LPAR(s) where a product executes.

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 Evolution
z/VSE Success Factors

z/VSE V5.1 + PTFs   **Jun 15, 2012**
- **CICS Explorer**
- **64-bit I/O for applications**
- **LFP in LPAR, DB connector**

Future

NEW

z/VSE V5.1   **Nov 25, 2011**
- **zEnterprise z196 / z114 exploitation**
- **ALS to System z9 (and higher)**
- **64-bit virtual addressing, LFP w/ z/VM**
- **SoD for CICS Explorer, LFP in LPAR**

NEW

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**

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**

Protect **I**ntegrate **E**xtend

Hardware Support
Capacity
Quality
z/OS Affinity
Interoperability

Pricing

Rebranding

Strategy

[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 V4.3 - General Availability since 11/26/2010
Previewed 10/20/2009, refreshed 07/22/2010, fully announced 10/05/2010

> Black = previewed
>
> Blue = added w/ full announce

§ **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

§ **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 since 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

Blue = PTF available since June 15, 2012

Black = PTF planned to be made available at a later date

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

Production System
z/VSE

Production System
Linux on System z

Linux Proxy

z/OS

Heartbeat
XDRHeartbeat

cmdReceiver
(init, switch, maint)

xDR scripts (xdr.*)
cmdreceiver

commands

Heartbeat
XDRHeartbeat

Heartbeat
XDRHeartbeat

Error
reporting
erpd

GDPS
System
1

Send Init Event
initvse

Send Init Event
erpd

z/VM

VM Device **3228**

hcp / vmcp   vmlogrdr

z/OS

Physical Device
4000

PPRC

Physical Device
5000

GDPS
System
2

Site 1

Site 2

Hyperswap

z/VSE Trends & Directions

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

Faster communication between z/VSE and Linux applications

Application

TCP/IP Stack

z/VSE Supervisor

z/VM

Application

TCP/IP Stack

Kernel

z/VM

HiperSockets, OSA, VSWITCH

network

Without LFP

Application

z/VSE Supervisor

Application

LFP Daemon

TCP/IP Stack

Kernel

IUCV   **z/VM**

z10, z196, z114, zEC12

network

With LFP under z/VM

network

z/VSE Trends & Directions   © 2012 IBM Corporation
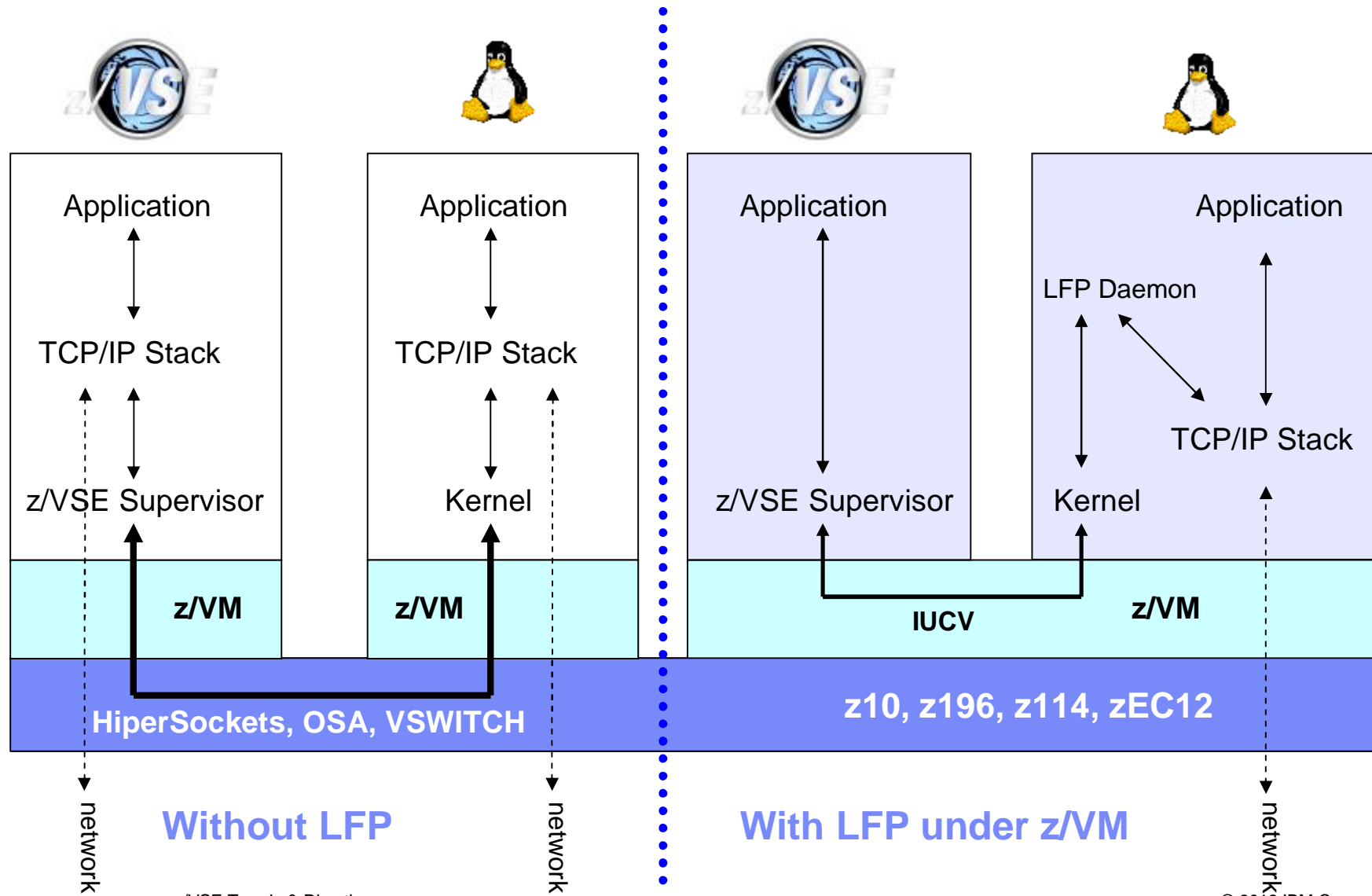
New: z/VSE z/VM IP Assist (VIA) (z/VSE V5.1 with z/VM V6.x)

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

NEW!

Without LFP

Application	Application
TCP/IP Stack	TCP/IP Stack
z/VSE Supervisor	Kernel
z/VM	**z/VM**

HiperSockets, OSA, VSWITCH

network — network

With LFP + VIA

Application
z/VSE Supervisor

IUCV → **VIA** **z/VM 6.x**

zEnterprise z196, z114, zEC12

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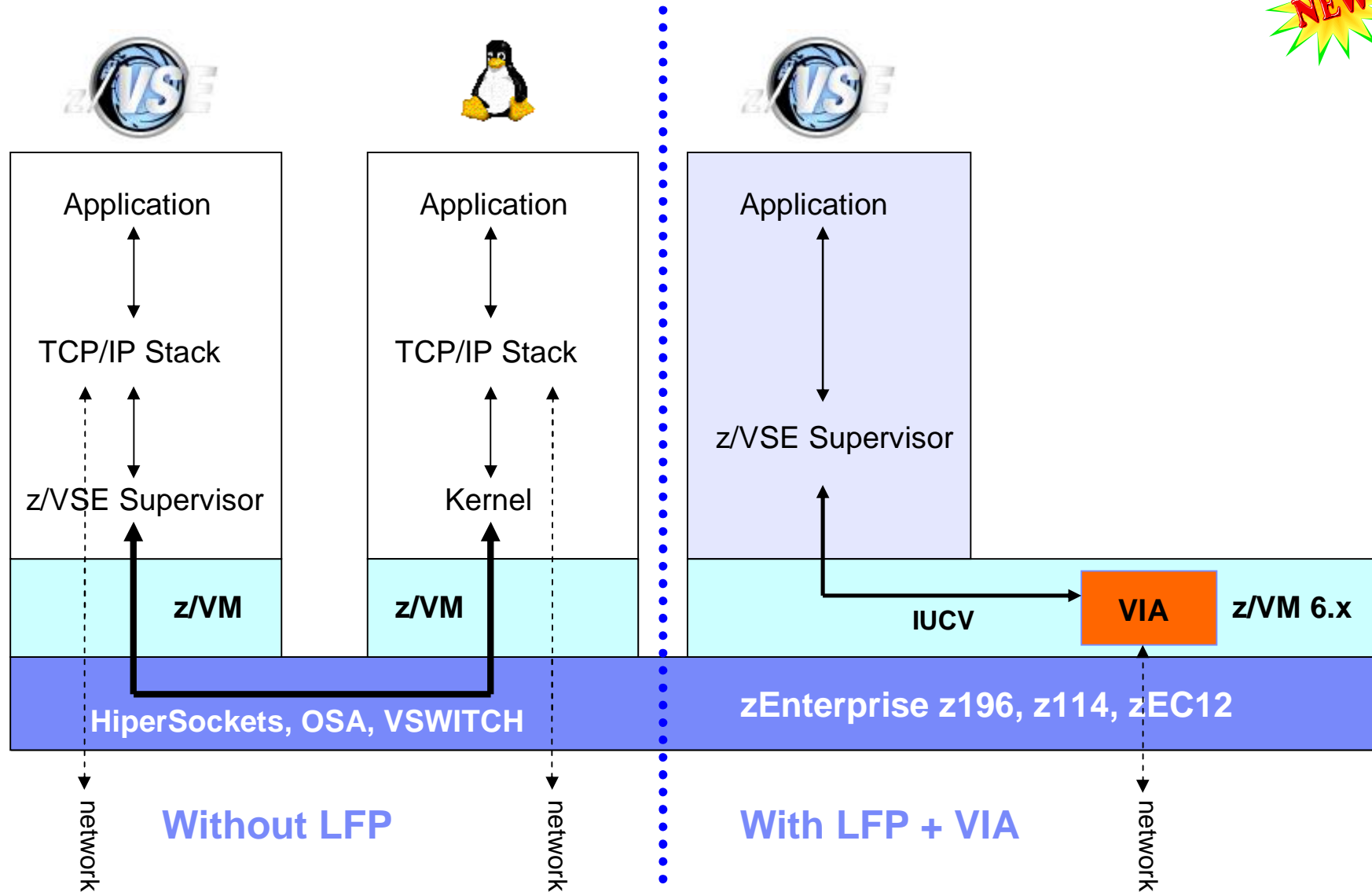
New: Linux Fast Path in an LPAR environment (z/VSE V5.1 + PTFs)

Faster communication between z/VSE and Linux applications

à Exploits the HiperSockets Completion Queue support of IBM zEnterprise

Without LFP

With LFP in LPAR

*) Driver level 93 or later

z/VSE Trends & Directions   © 2012 IBM Corporation
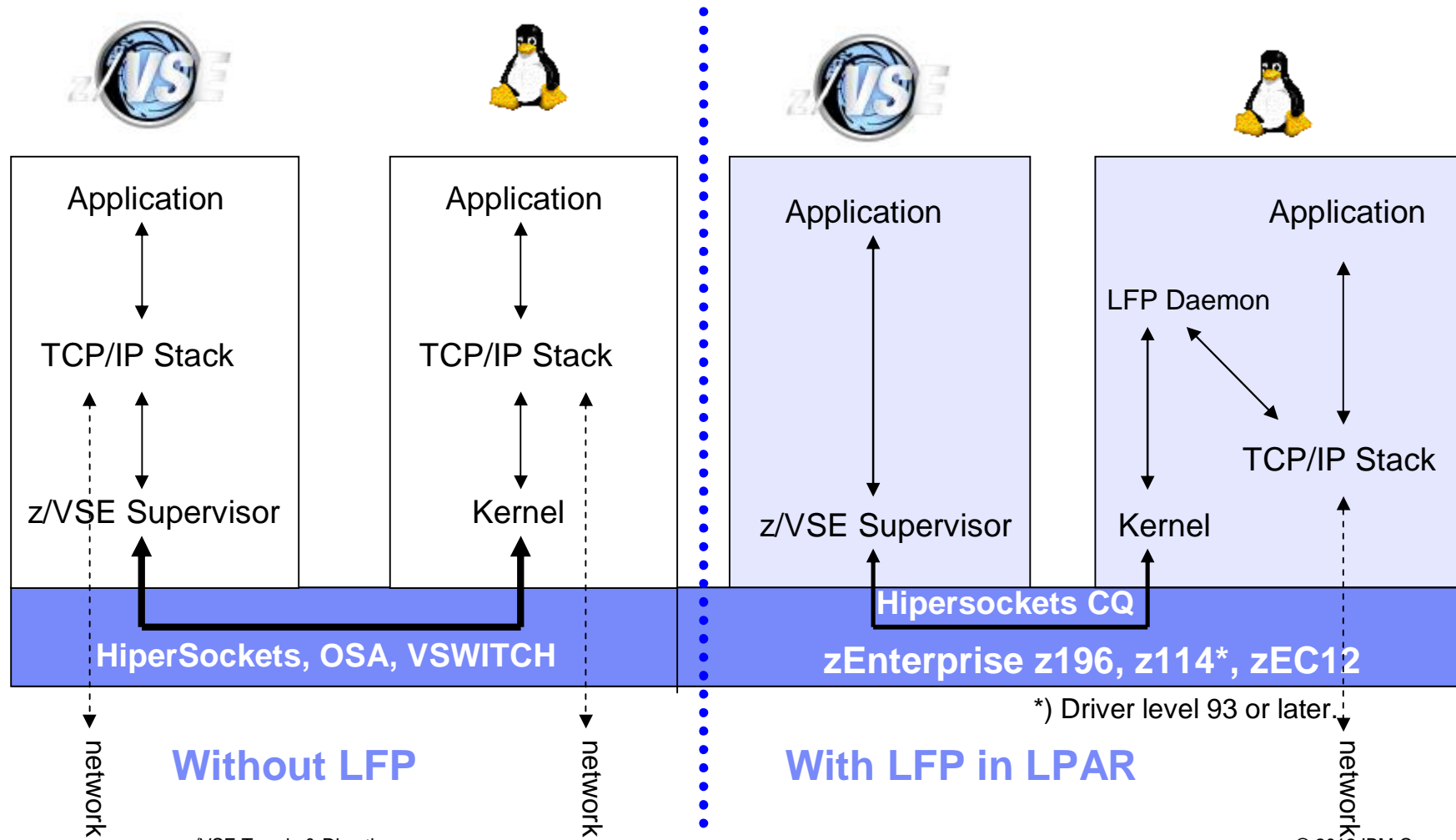
Options for using Databases with z/VSE applications

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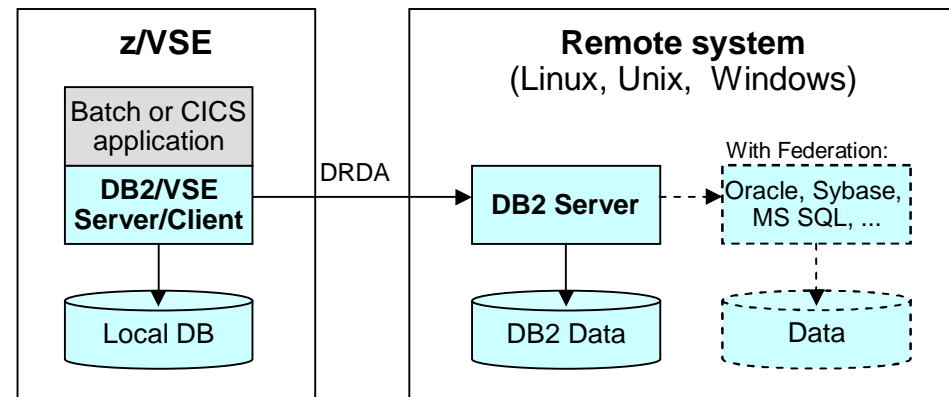
§ VSAM Redirector
- Primarily used to keep databases in sync with VSAM data
- Also allows migration from VSAM to database

§ 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

Batch or CICS application

DB2/VSE Server/Client

Local DB

DRDA

Remote system
(Linux, Unix, Windows)

DB2 Server

DB2 Data

With Federation:

Oracle, Sybase, MS SQL, ...

Data

NEW!

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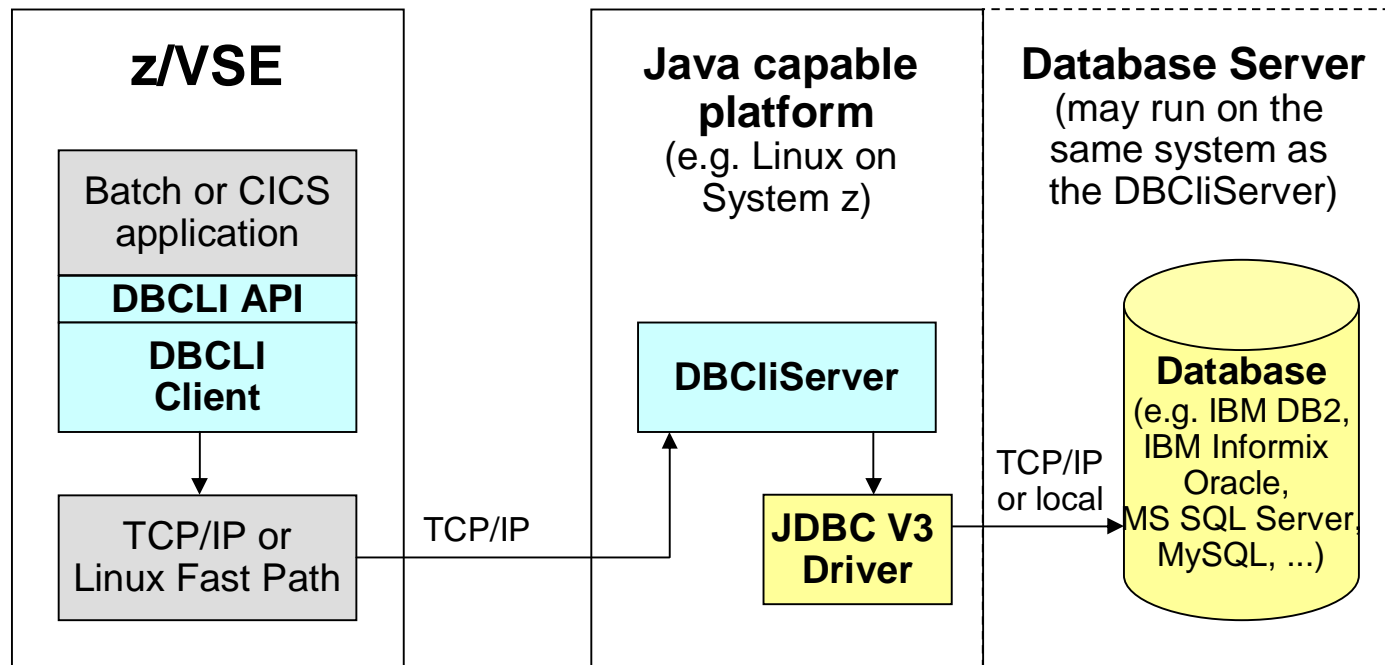
z/VSE support for IBM CICS Explorer –
The "new face of CICS Transaction Server for VSE/ESA"

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."

z/VSE Trends & Directions

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 Trends & Directions

z/VSE continues to demonstrate IBM's commitment

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

z/VSE V5.1.1 - 2Q2012

Ø**64-bit I/O for applications**

Ø**CICS Explorer support**

Ø**Linux Fast Path in LPAR**

Ø**Database connector**

z/VSE V5.1 - 4Q2011

Ø**z196 / z114 exploitation**

Ø**64-bit virtual memory objects**

Ø**ALS to System z9 (and higher)**

Ø**z/VSE z/VM IP Assist (VIA)**

z/VSE V4.3 - 4Q2010

Ø**z196 toleration / exploitation**

Ø**4-digit CUU, LFP with z/VM**

Ø**24-bit virtual storage constraint relief**

Ø**IPv6/VSE as optional product**

+ SoD: CICS Explorer & LFP in LPAR

+ SoD: 64-bit support

z/VSE Trends & Directions

Press on z/VSE

Clipper Group: Sep 2011

zJournal: April/May 2011

The z/VSE Fast Path to Linux on System z

by Ingo Franzki,
Karsten Graul
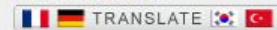
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TRANSLATE
< Previous Page 1 2 3 4 Next Page >

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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Published Since 1993   Report #TCG2011031LI   September 6, 2011

Navigating Information Technology Horizons™

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.
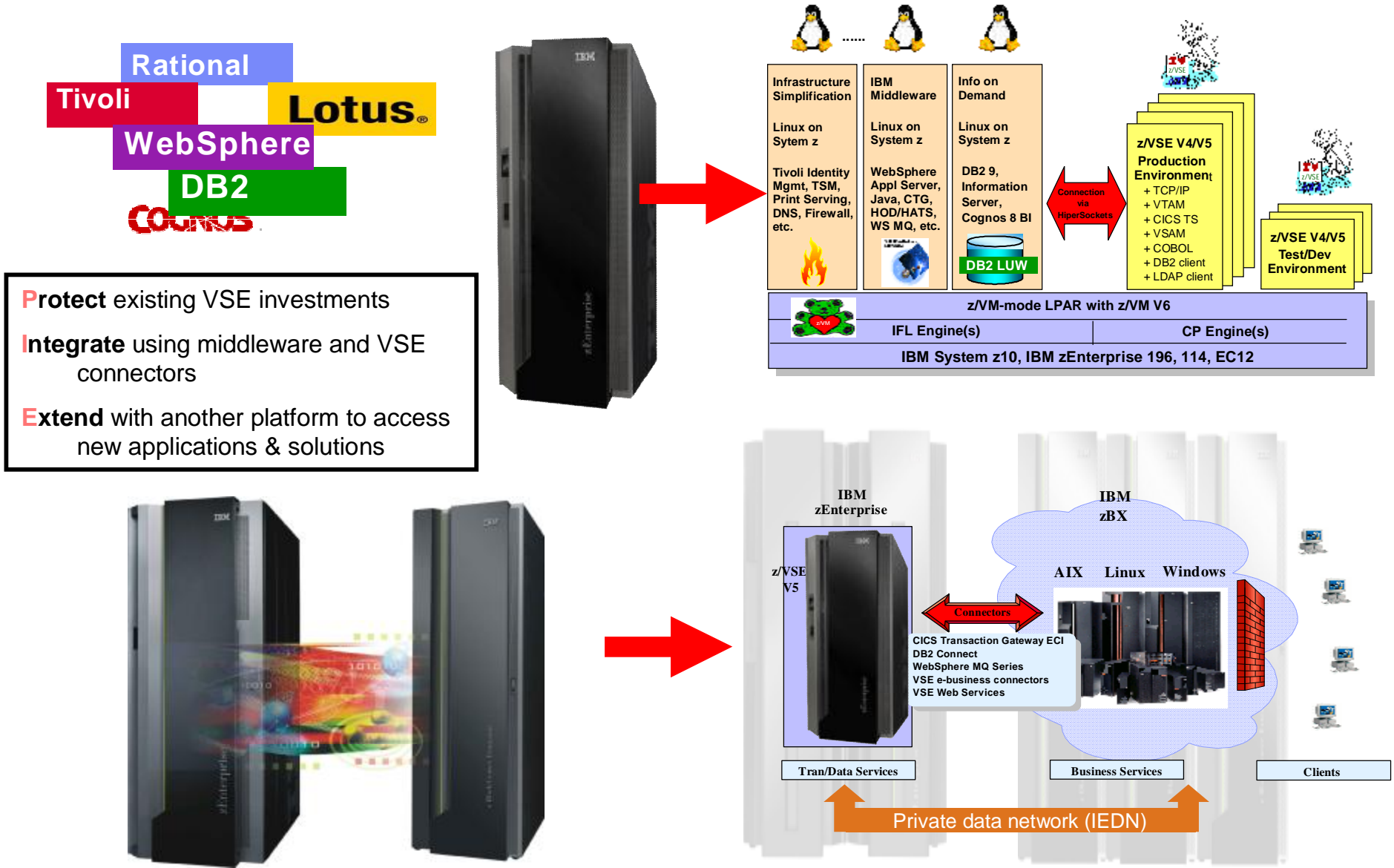
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➤ The Impact of the zEnterprise z114	6
➤ Conclusion	8

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

Rational
Tivoli
Lotus.
WebSphere
DB2
COGNOS

Protect existing VSE investments

Integrate using middleware and VSE connectors

Extend with another platform to access new applications & solutions

Infrastructure Simplification	IBM Middleware	Info on Demand
Linux on Sytem z	Linux on System z	Linux on System z
Tivoli Identity Mgmt, TSM, Print Serving, DNS, Firewall, etc.	WebSphere Appl Server, Java, CTG, HOD/HATS, WS MQ, etc.	DB2 9, Information Server, Cognos 8 BI

DB2 LUW

Connection via HiperSockets

z/VSE V4/V5 Production Environment
+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2 client
+ LDAP client

z/VSE V4/V5 Test/Dev Environment

z/VM-mode LPAR with z/VM V6

IFL Engine(s)	CP Engine(s)

IBM System z10, IBM zEnterprise 196, 114, EC12

IBM zEnterprise

IBM zBX

z/VSE V5

AIX   Linux   Windows

Connectors

CICS Transaction Gateway ECI
DB2 Connect
WebSphere MQ Series
VSE e-business connectors
VSE Web Services

Tran/Data Services

Business Services

Clients

Private data network (IEDN)

z/VSE Trends & Directions

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

Thank You

z/VSE Trends & Directions