



2007 IBM System z Technical Conference

Session E41: z/VSE Version 4 News and Views

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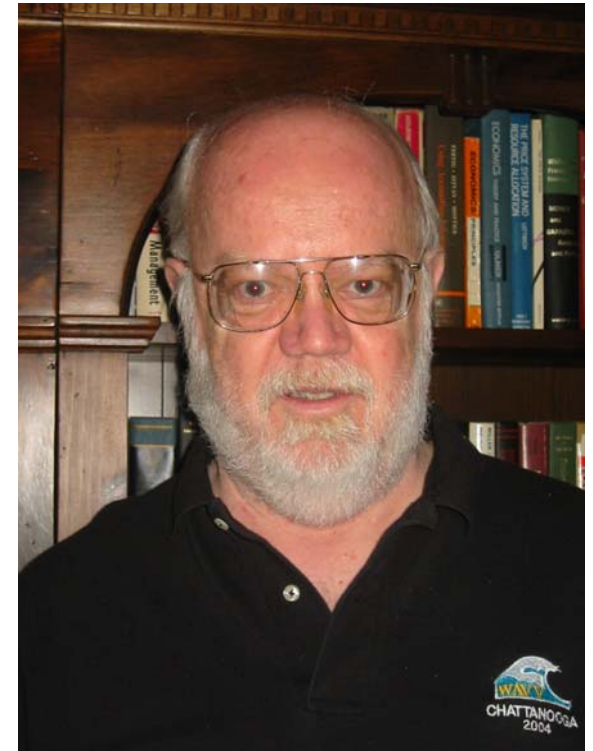
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- **E41 Abstract:** This session focuses on z/VSE Version 4. It covers z/VSE status, content, strategy (including SOA and interoperability), as well as the benefits of an hybrid environment incorporating the best of z/VSE and Linux on System z. The session will also review attractive new MLWC pricing (with full-capacity and sub-capacity options) introduced exclusively for z/VSE V4 on IBM System z9. It includes examples of z9 EC and z9 BC opportunities made possible by IBM's renewed emphasis on z/VSE V4.
- **Biography:** G. M. (Jerry) Johnston is a Senior Advisor with z/VSE development. He has responsibilities in strategy, planning, product introduction, and marketing support. His 40 years of IBM experience includes systems engineering, processor planning manager, division headquarters staff, and software development manager. Jerry holds a Masters in Mechanical Engineering from Georgia Tech, as well as an MBA from the Wharton School of the University of Pennsylvania.

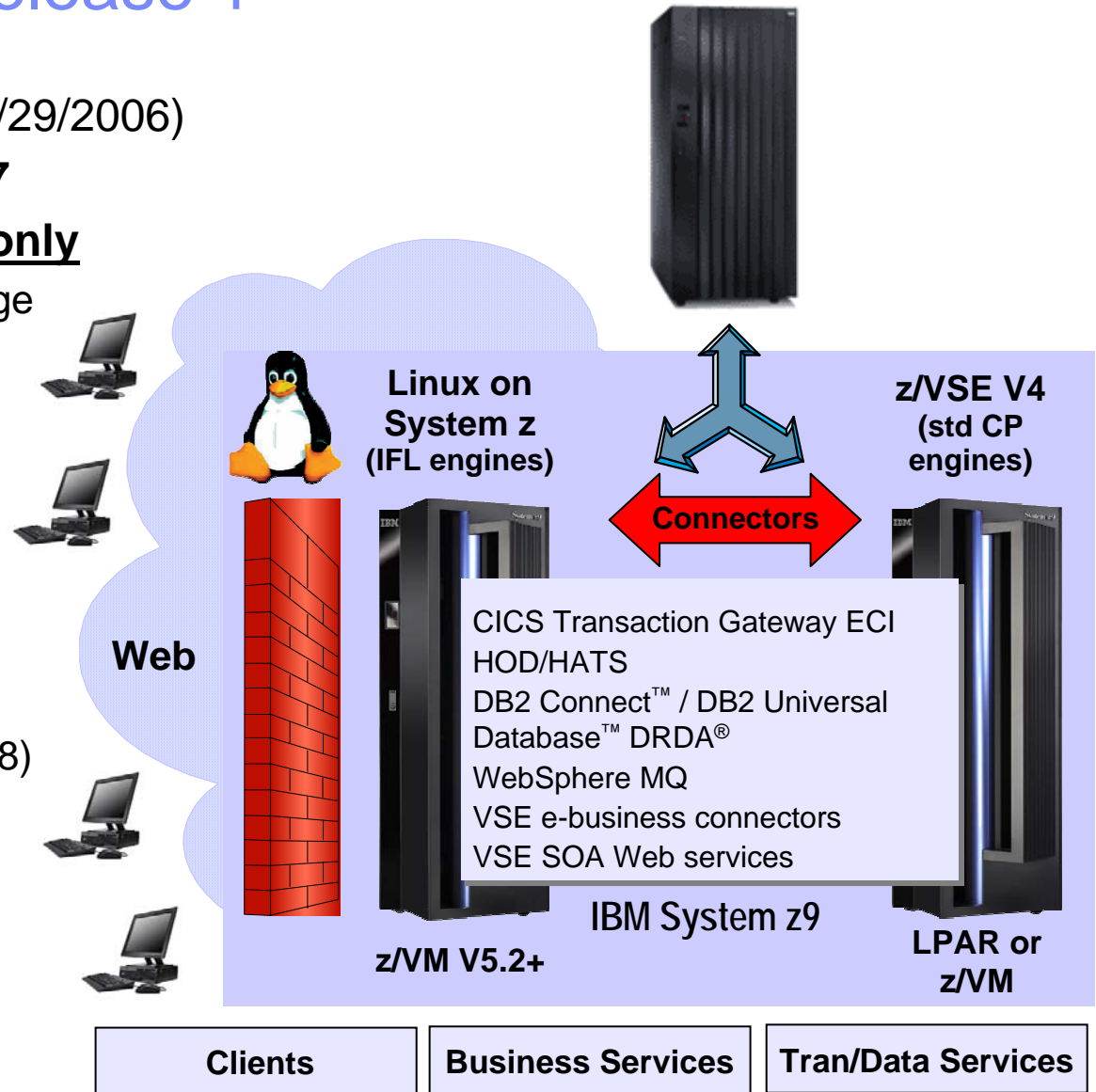




z/VSE V4 Overview

z/VSE Version 4 Release 1

- Announce 1/9/2007 (Preview 4/29/2006)
- **General Availability 3/16/2007**
- **z/Architecture (64-bit) mode only**
 - Up to 8 GB real processor storage
 - System z9 EC *and* z9 BC
 - zSeries 990, 890, 900, 800
- **New MWLC pricing metrics (z9 only)**
 - Low full-capacity price points
 - Sub-capacity option
- **Encryption enhancements**
 - CPACF enhancements (AES-128)
 - Crypto Express2 (configurable)
 - TS1120 encrypting tape
 - SecureFTP
- **SOA and interoperability**





z/VSE Heritage

IBM Mainframe & VSE Evolution

▪ S/360->S/370->4300->9370->ES9000->S/390->zSeries->z9

▪ DOS/360, DOS/VS->DOS/VSE->(SSX)->VSE/SP
VSE/ESA V1->VSE/ESA V2 ->z/VSE V3 -> zVSE V4

▪ S/360 Model 30

- 30 KIPS (.03 MIPS)
- 16 - 64 KB

▪ DOS/360

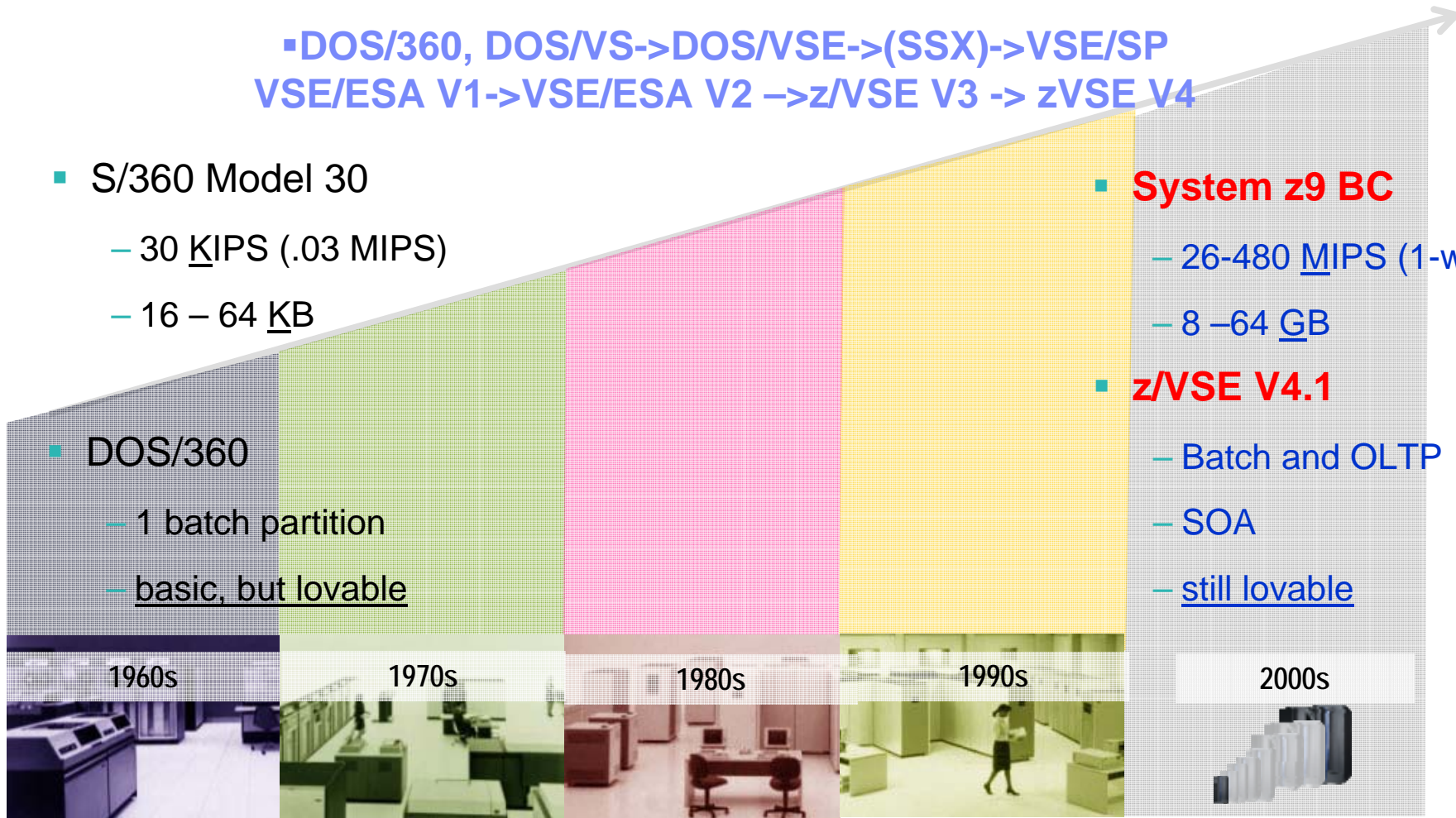
- 1 batch partition
- basic, but lovable

▪ **System z9 BC**

- 26-480 MIPS (1-way)
- 8 - 64 GB

▪ **z/VSE V4.1**

- Batch and OLTP
- SOA
- still lovable



1960s

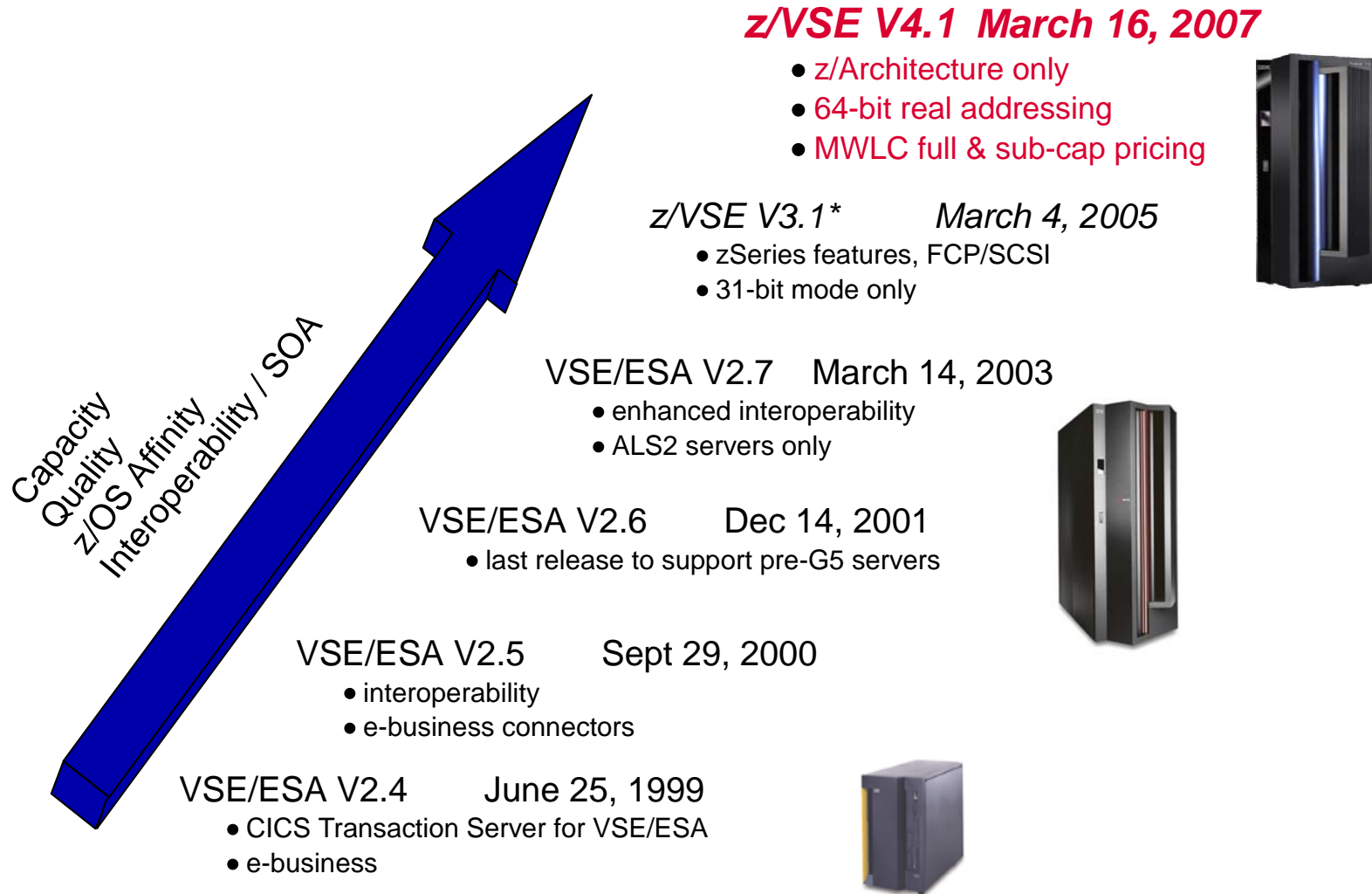
1970s

1980s

1990s

2000s

Recent VSE History



Changes since January 2006

- 01/01/2006 - withdrawal of ESL option
- 01/15/2006 - S/390 SUF discontinued (replaced by ShopzSeries)
- 02/07/2006 - announce EoS for HLASM V1.4 (effective 4/7/2007)
- 02/13/2006 - 31-bit VTAM I/O buffers for z/VSE V3 available via PTF
- 03/31/2006 - EoS for VSE/ESA V2.6 effective
- 04/27/2006 - IBM System z9 EC and z9 BC Announcement
- 04/27/2006 - z/VSE V4.1 Preview
- 07/21/2006 - z/VSE V3.1.2 (service update and consolidation) available
- 08/29/2006 - SOD for z/VSE support of TS1120 tape drive encrypting capability
- **01/09/2007 - z/VSE Version 4 Release 1 Announcement**
- **01/09/2007 - Midrange Workload License Charge (MWLC) for z/VSE V4**
- **02/28/2007 - EoS for VSE/ESA V2.7 effective**
- **03/16/2007 - z/VSE V4.1 General Availability**

z/VSE Status

VSE Version and Release	Marketed	Supported	End of Support
z/VSE V4.1	Yes	Yes	tbd
z/VSE V3.1	Yes	Yes	tbd
VSE/ESA V2.7	No	No	02/28/2007



z/VSE Version 4 Release 1



z/VSSE Version 4 Release 1

- Preview 4/27/2006
- Announce 1/9/2007
- **General Availability 3/16/2007**
- **z/Architecture mode only**
 - 64-bit *real* addressing (31-bit *virtual* addressing)
 - up to 8 GB real processor storage
 - IBM System z9 EC and z9 BC servers
 - IBM eServer zSeries 990, 890, 900, and 800 servers
- **Capacity Measurement Tool (CMT)**
 - fulfills SOD from July 2005
- **New MWLC pricing metrics (z9 EC and z9 BC only)**
 - Improved price/performance with full-capacity MWLC price points
 - Sub-capacity MWLC option for added price/performance
- **Encryption enhancements**
 - CPACF enhancements (AES-128)
 - Configurable Crypto Express2 (new accelerator option)
 - TS1120 encrypting tape
 - SecureFTP



z/VSE Version 4 Release 1 (cont.)

- **IBM System Storage**
 - TS7700 Virtualization Engine
 - TS3500 Tape Library
 - DS6000/DS8000 64K cylinder ECKD volumes
- **TCP/IP for VSE/ESA V1.5 Service Pack E enhancements**, including
 - TCP/IP stack
 - Performance
 - FTP
 - Security and SSL
 - SecureFTP
 - CPACF AES-128
 - Crypto Express2 2048-bit RSA keys
 - Message Logging
 - Telnet
 - eMail
 - BSE/C Socket API



z/VSE Version 4 Release 1 (cont.)

- **SOA and Interoperability**
 - VTAPE interface to Tivoli® Storage Manager (TSM) to backup VSE data
 - VSAM Capture Exit
 - upgrade to JDK 1.5 (Java5) standard
- **Component changes**
 - ACF/VTAM V4.2 31-bit buffers
 - BSM security logging and reporting
 - VSE/POWER enhancements
 - LE/VSE enhancements and z/OS affinity
- **Miscellaneous**
 - Single Supervisor
 - SDAID
- **FSU from z/VSE V3.1 and VSE/ESA V2.7**
- **Requires z/VM V5.2 (or later) if running under VM**



IBM System z9 Exploitation

Functions	z/VSE V4.1	z/VSE V3.1 (Note 1)
z/Architecture mode only	Yes	No
64-bit <i>real</i> addressing (up to 8 GB proc storage)	Yes	No
Fibre Channel Protocol (FCP) for SCSI Disks	Yes	Yes
CP Assist for Cryptographic Function (CPACF)	Yes	Yes
Crypto Express2 (SSL clear key encryption assist)	Yes	Yes
HiperSockets™ (including spanned HiperSockets)	Yes	Yes
FICON Express2™ & FICON Express4™	Yes	Yes
OSA Express2 (incl 10Gb and Gb ethernet)	Yes	Yes
OSA Integrated Console Controller (OSA-ICC)	Yes	Yes
Up to 60 LPARs and 4 LCSSs	Yes	Yes

z/VSE Support for Mainframe Servers

IBM Servers	z/VSE V4.1	z/VSE V3.1 (Note 1)
IBM System z9 Enterprise Class (formerly z9-109)	Yes	Yes
IBM System z9 Business Class (z9 BC)	Yes	Yes
IBM eServer zSeries 990, 890, 900, 800	Yes	Yes
S/390® Parallel Enterprise Server™ G5/G6	No	Yes
S/390® Multiprise® 3000	No	Yes
S/390® Parallel Enterprise Server™ G1/2/3/4	No	No
S/390® Multiprise® 2000	No	No
S/390® Integrated Server	No	No
P/390 and R/390	No	No
ES/9000 – 9221, 9121, 9021	No	No

z/VSE support for IBM System Storage



IBM System Storage	DS6000	ESS 750, 800, 800Turbo	DS8000. DS8000 Turbo
ESCON	Not Avail	Yes	Yes
FICON	Yes	Yes	Yes
FCP/SCSI	Yes	Yes	Yes

z/VSE support for IBM TS1120 Tape Drive Encryption

- **IBM System Storage TS1120 - first encrypting tape drive**
 - Standard feature on new TS1120 tape drives
 - Supports data encryption using 256 bit AES encryption
 - Microcode enhancements for encryption policy and key communications
 - Encryption performed with minimal (< 1% data rate performance impact)
 - Data is compressed *and* encrypted – no change in media utilization
 - Supports “traditional” and “encrypted” modes of operation
 - Encryption “disabled” unless otherwise specified
 - Chargeable upgrade feature for existing TS1120 Drives
- **z/VSE V4.1 designed for Systems Managed Encryption**
 - Support may be available via PTF after z/VSE V4.1 GA
 - SOD for z/VSE V3.1
- **Innovative IBM Encryption Key Manager (EKM) component for Java platform™ supported on a wide range of systems including:**
 - z/OS, AIX, Linux (incl System z), i5/OS, HP, Sun, and Windows
- **Integration with IBM tape systems, libraries**



TS1120
500 GB
100 MB/sec

**Encryption Key
Manager**



z/VSE Comparison

- **z/VSE V3.1* (GA 3/2005)**
 - ESA/390 (31-bit) mode only
 - up to 2GB real processor storage
 - System z9 EC *and* z9 BC
 - zSeries 990, 890, 900, 800
 - **Multiprise 3000 & S/390 G5/G6**
 -
 - HiperSockets
 - CPACF
 - Crypto Express2 (configurable)
 - FCP/SCSI disks & NPIV
 - DS8000, DS6000, ESS
 - FICON Express2 & 4
 - OSA Express2
 - 31-bit buffers for ACF/VTAM (via PTF)
 - **SOD for TS1120 encrypting tape**
- **z/VSE V4.1 (GA Planned 3/2007)**
 - **z/Architecture (64-bit) mode only**
 - **up to 8 GB real processor storage**
 - System z9 EC *and* z9 BC
 - zSeries 990, 890, 900, 800
 - **MWLC Pricing Metric (z9 only)**
 - **Full-capacity and sub-capacity mode**
 - HiperSockets
 - CPACF + **enhancements**
 - Crypto Express2 (configurable)
 - FPC/SCSI disk & NPIV + **point-to-point**
 - DS8000, DS6000, ESS
 - FICON Express2 & 4
 - OSA Express2
 - 31-bit buffers for ACF/VTAM
 - TS1120 encrypting tape

Introducing a New Price Metric for z/VSE V4

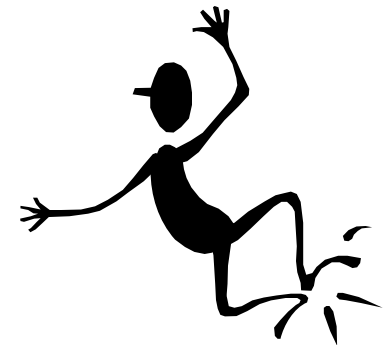


Midrange Workload License Charge (MWLC)

- Requires current hardware (IBM System z9 EC or z9 BC) *and* z/VSE V4
 - exception: z9 BC Capacity Setting A01 remains zELC

- Full-capacity and sub-capacity MWLC options
 - full-capacity mode offers improved price/performance compared to GOLC, zELC, and TWLC alternatives
 - additional price/performance possible through sub-capacity mode

- Structured to help address new z9 opportunities



VSE & VSE-related Products Eligible for MWLC

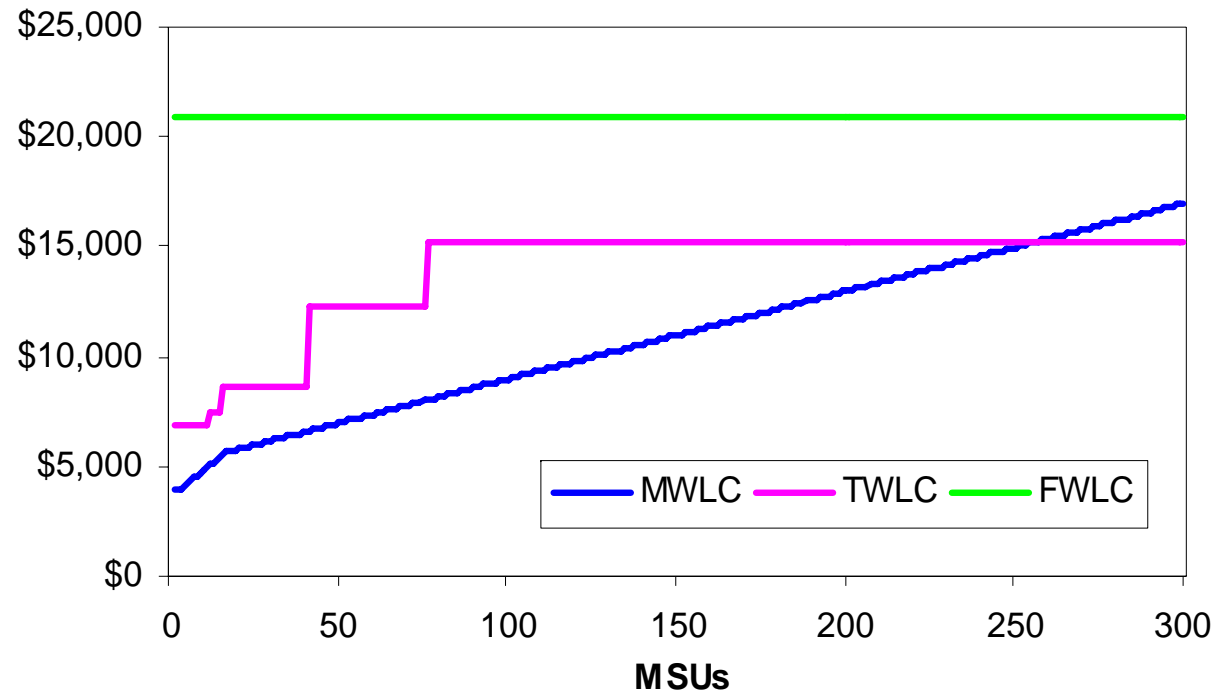
■ Base

- 5686 CF8 VSE Central Functions
- 5696 234 HLASM
- 5648 054 CICS TS for VSE/ESA V1
- 5686 065 ACF/VTAM® VSE/ESA V4
- 5686 A04 TCP/IP for VSE/ESA V1.5
- 5648 099 DITTO/ESA® for VSE
- 5697 F42 DB2 Server for VSE & VM

■ Optional Products

- 5686 068 IBM COBOL for VSE/ESA
- 5686 A01 IBM C for VSE/ESA
- 5686 069 IBM PL/1 for VSE/ESA
- 5746 SM3 IBM DFSORT /VSE V3
- 5746 XX1 DL/I DOS/VS
- 5686 A06 MQSERIES® VSE/ESA

MWLC Sample Stack vs. TWLC and FWLC



- Customers may choose between MWLC/TWLC or MWLC/FWLC as appropriate to their machine
- Additional price/performance may be possible with sub-capacity mode

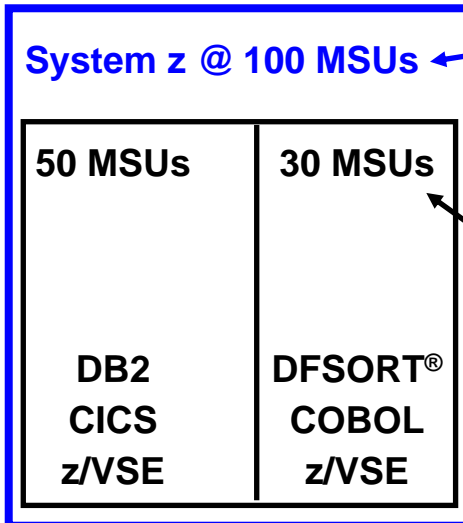
*Sample software stack includes: VSE CF V8, HLASM, VTAM, DITTO, COBOL

*Prices subject to change without notice; all prices shown in USD

What is sub-capacity?

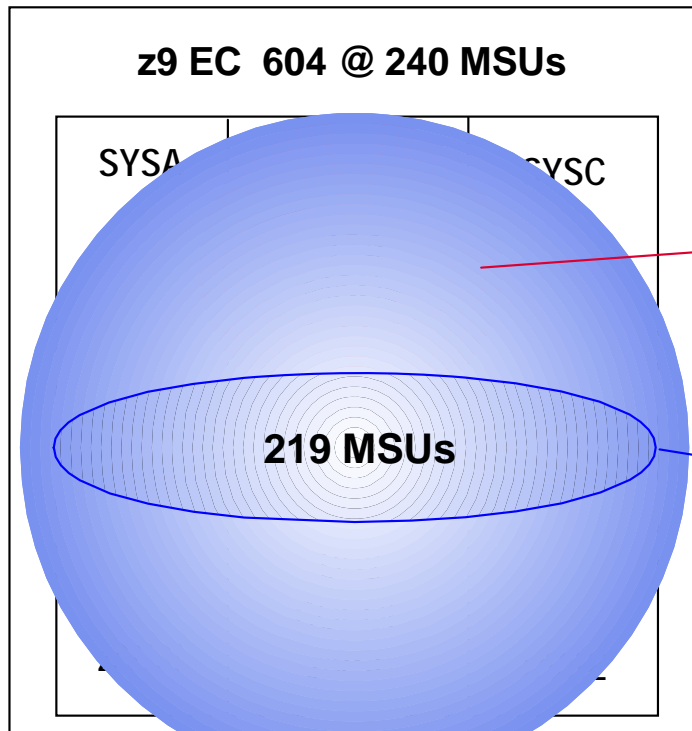


Full-Capacity Pricing Metric relies on the total rated capacity (measured in MSUs) of the MACHINE where a product executes.

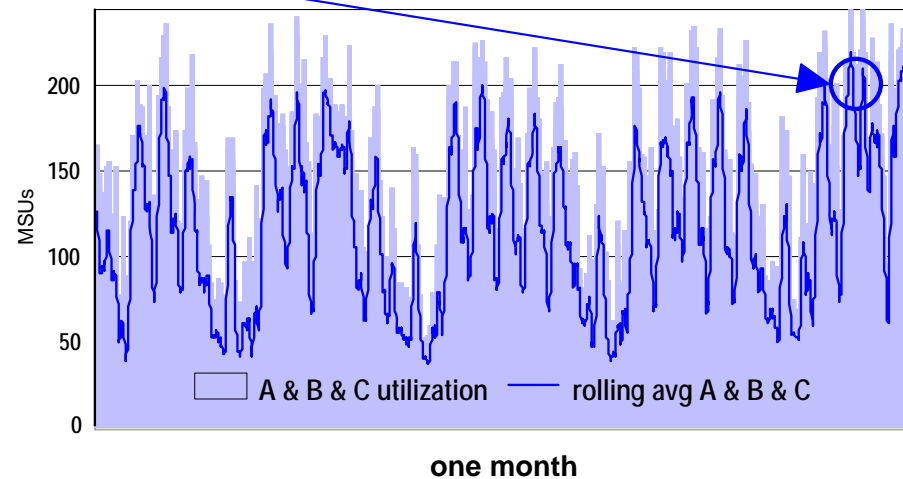
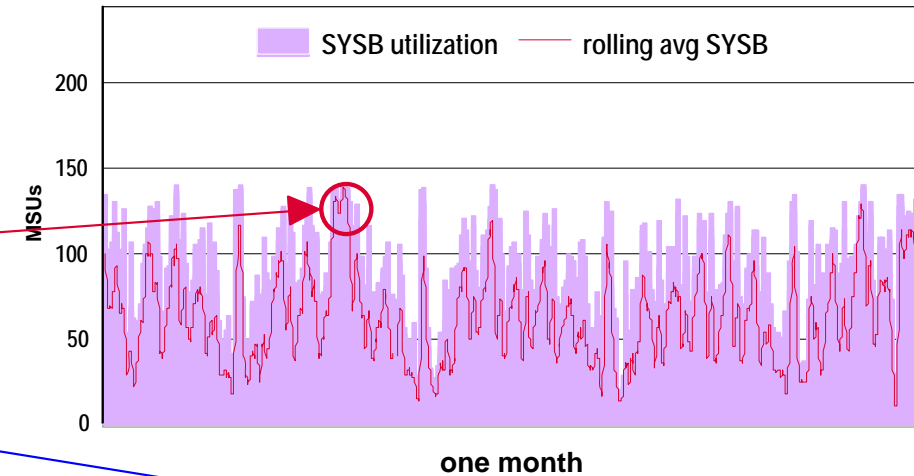


Sub-Capacity Pricing Metric relies on the utilization (based on peak 4-hour rolling average each month) of the LPAR(s) or guest Virtual Machines where a product executes.

Generic sub-capacity example



Product	Sub-Cap MSUs
DB2	139 MSUs
COBOL	139 MSUs
z/VSE	219 MSUs



Summary of z/VSE Price Metrics

IBM Servers	z/VSE V4.1	z/VSE V3.1 (Note 1)
IBM System z9 Enterprise Class – z9 EC (formerly z9-109)	MWLC (may be flat WLC)	GMLC, ELC, flat WLC
IBM System z9 Business Class – z9 BC	MWLC (A01 is zELC)	TWLC (A01 is zELC)
IBM eServer zSeries 990 and 900	GMLC, ELC, flat WLC	GMLC, ELC, flat WLC
IBM eServer zSeries 890	TWLC (110 is zELC)	TWLC (110 is zELC)
IBM eServer zSeries 800	zELC	zELC
S/390® Parallel Enterprise Server™ G5/G6	not applicable	GMLC, ELC, flat WLC
S/390® Multiprise® 3000	not applicable	GOLC

New z9 Opportunities possible with MWLC

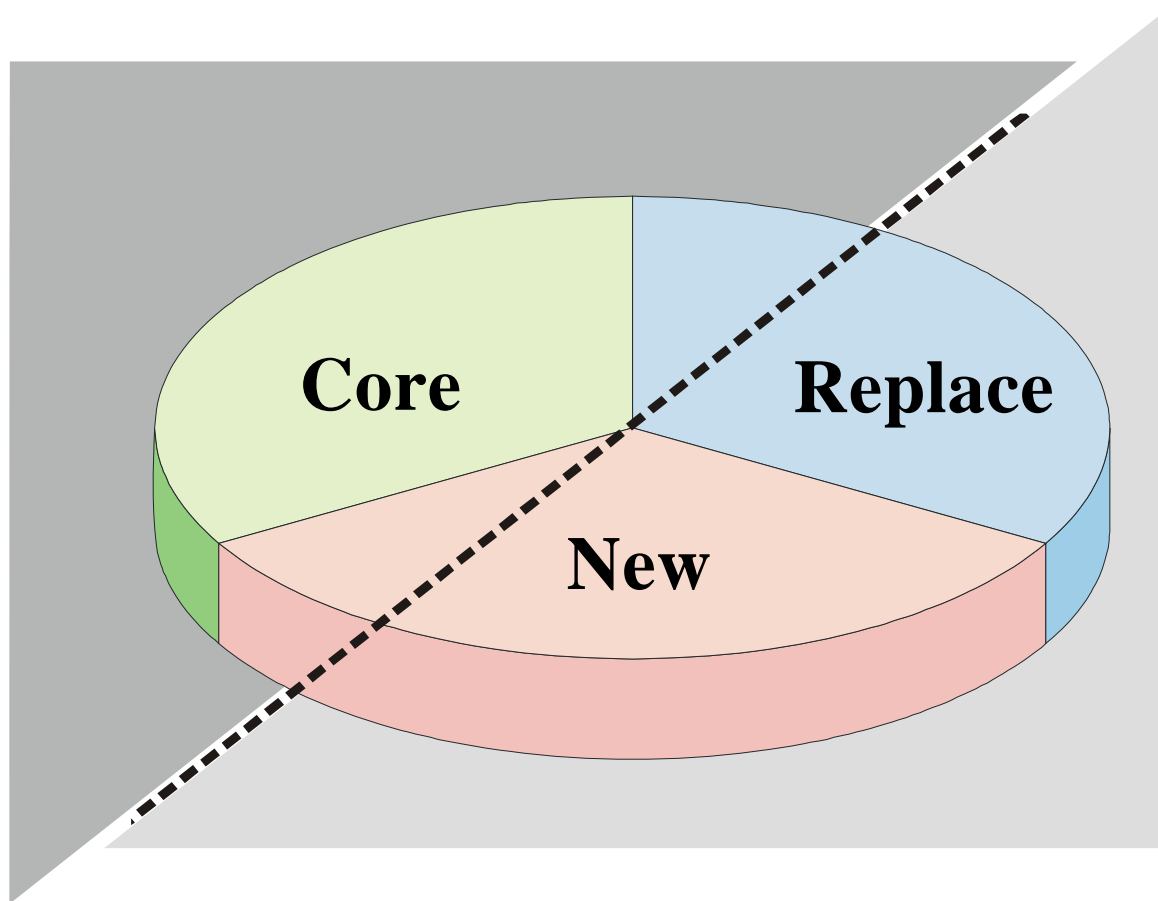


- **More MSUs for the same, or slightly lower, IBM software \$**
 - **More capacity** for future growth, workload spikes, seasonal factors, emergencies, etc.
 - disconnect hardware growth from software charges
 - grow into capacity gradually with a 1 MSU level of granularity
 - IBM software \$ respond to normal cyclicality
 - Isolate middleware products to reduce software costs (depending on workload)
 - examine workload to identify where you might limit product use to specific LPARs (or VM guests)
 - limit LPAR (or VM guest) utilization to control software costs (optional)
 - expand production LPARs (or VM guests) without impacting other LPARs (or VM guests)
 - **Add IFL(s) and Linux-based IBM middleware to the mix for new workloads**
- **Pick the server that best meets your needs**
 - High end and midrange **z9 servers** are no longer priced differently
- **Consolidate servers in large accounts**
 - **Consolidate** remote, vulnerable VSE workloads onto LPARs on System z9 EC servers primarily running z/OS at HQ
- **The same MSUs for lower IBM software \$**



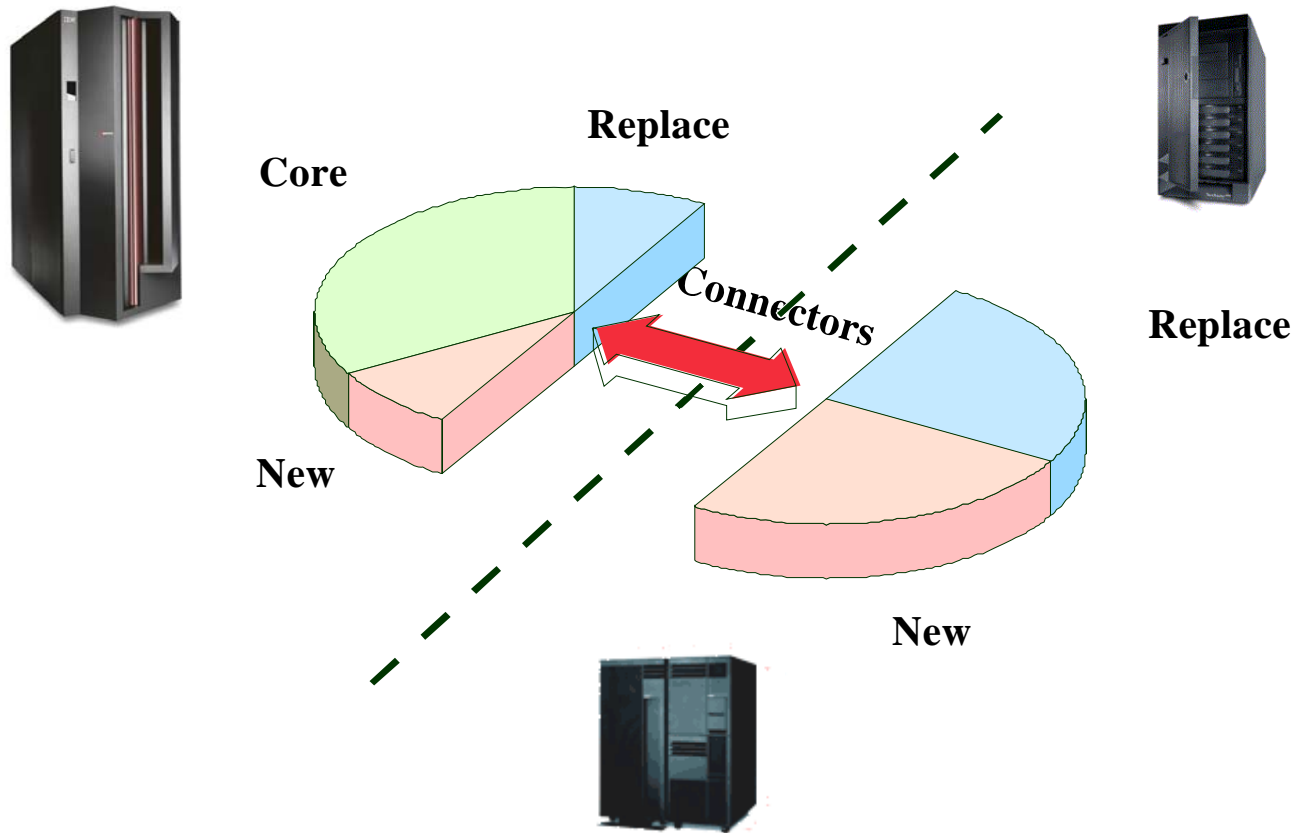
z/VSE Strategy

Customer Application Portfolio:

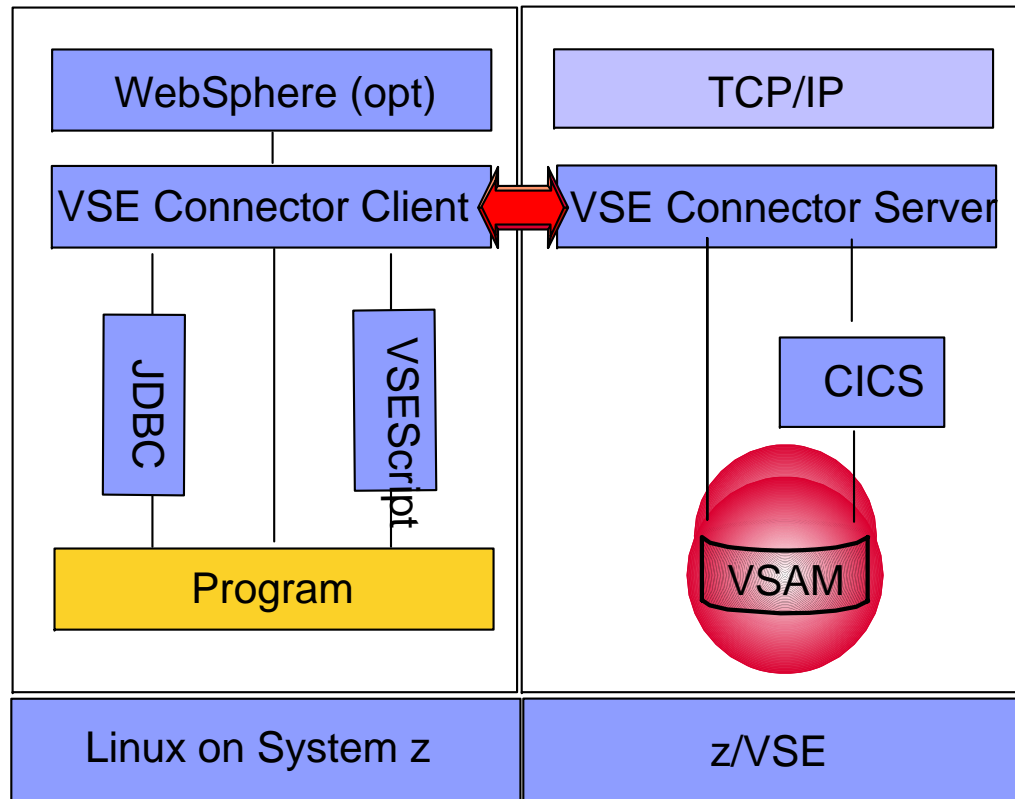


Note: Pie arbitrarily divided into thirds. Percent of applications
In each category is unique to each customer

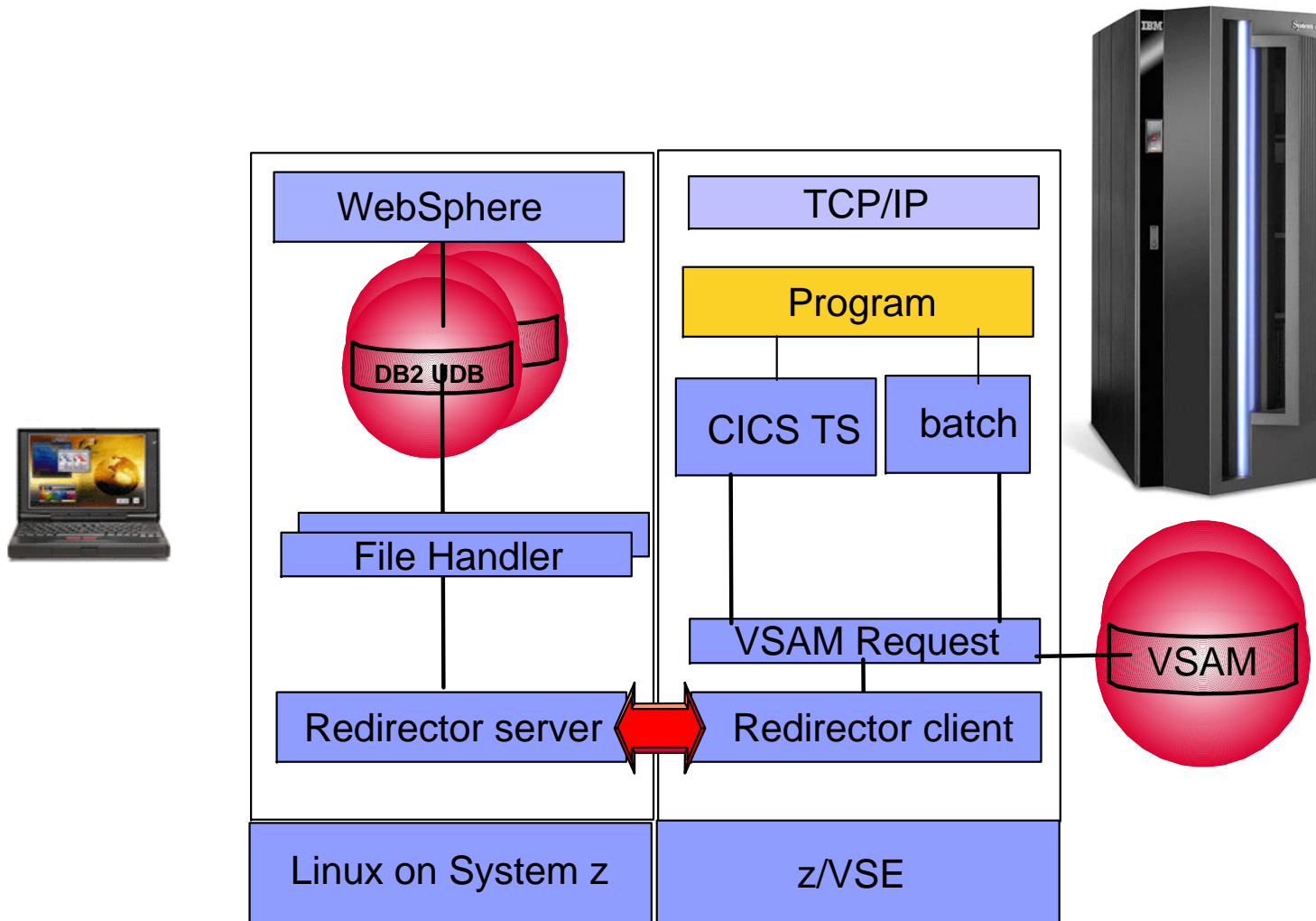
Integrating z/VSE into the IT network



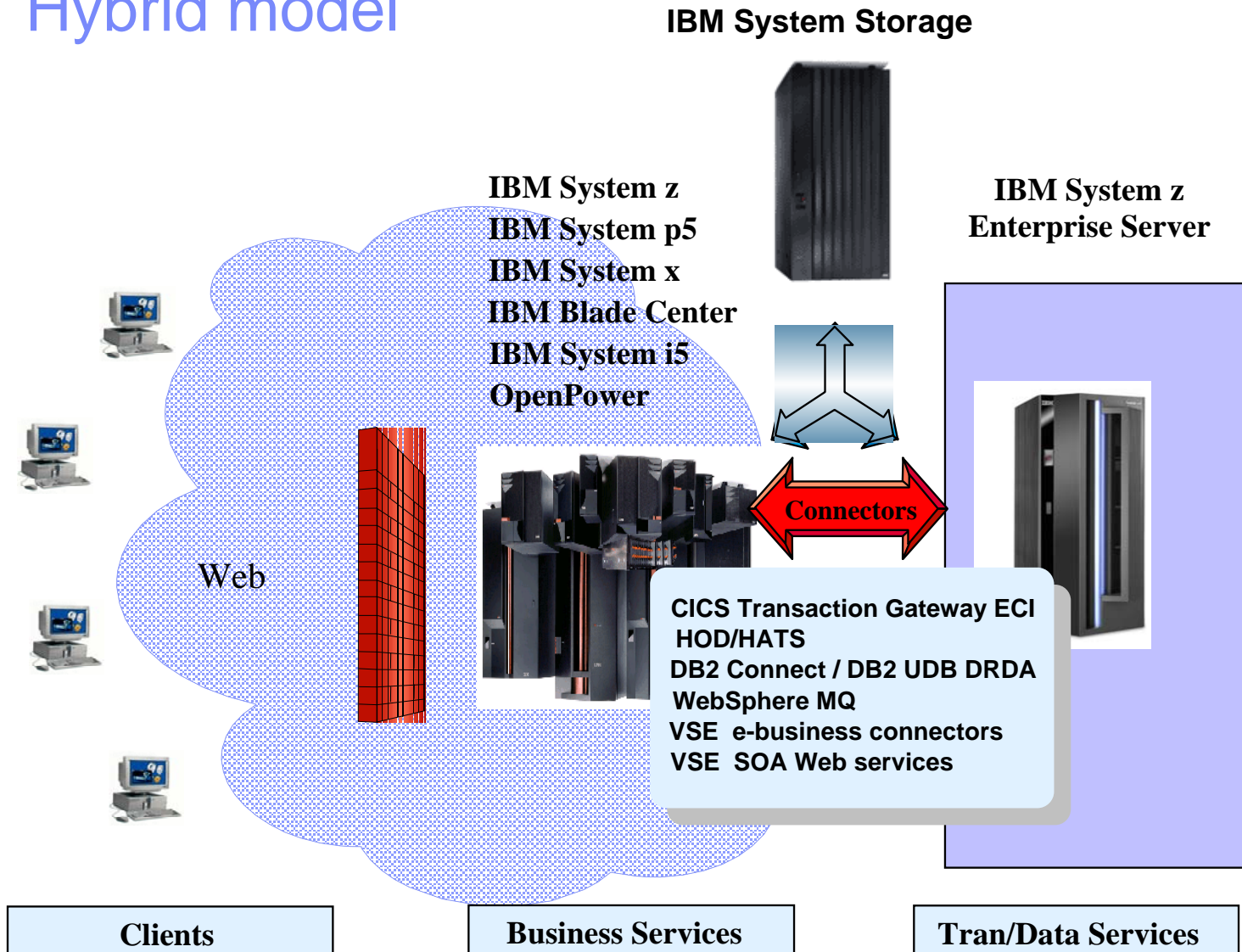
VSAM Connector



VSE/VSAM Redirector



Hybrid model



z/VSE SOA and Interoperability

Connector Functions	z/VSE V4.1	z/VSE V3.1 (Note 1)
VSE Connectors (no additional charge)		
SOA Web Services, i.e. SOAP and XML	Yes	Yes
VSAM Redirector	Yes	Yes
VSAM, POWER, Librarian, ICCF lib, console	Yes	Yes
VSE Script and DL/1	Yes	Yes
DB2 Stored Procedures for VSAM and DL/1	Yes	Yes
IBM Middleware (priced)		
CICS Transaction Gateway ECI	Yes	Yes
Host on Demand / Host Application Transformation	Yes	Yes
DB2 Connect/DB2 UDB (DB2 Server for VSE PRPQ)	Yes	Yes
WebSphere MQ (VSE Client no charge)	Yes	Yes

z/VSE “PIE” Strategy

- Help **P**rotect existing customer investments in core z/VSE programs, data, equipment, IT skills, *plus* business processes, end user training
 - Modernize, i.e. extend z/VSE resources to Web
 - Exploit IBM servers, storage, and software
 - z/OS affinity
- Help **I**ntegrate z/VSE with the rest of IT, based on open and industry standards
 - VSE connectors and SOA Web services
 - IBM middleware
- Help **E**xtend solutions with Linux on System z
 - Linux as preferred platform for new workloads
 - leverage existing core VSE investments
 - low cost, low risk, fast time-to-market
 - New line-of-business applications
 - Low TCO and infrastructure simplification



z/VSE Directions

■ **Protect**

- basic hardware support and selective exploitation
 - IBM System z9 (incl CPACF, Crypto Express2, FICON Express4, etc.)
 - IBM TotalStorage (incl DS8000 Turbo, TS1120 & encryption, etc.)
- value
 - availability / integrity / reliability / security
 - continuity / stability / z/OS affinity
 - ease-of-use / maintainability / serviceability
 - lower total cost of ownership (TCO) / flexible terms and conditions
 - specific customer requests (WAVV, GSE, individuals, etc. requirements)

■ **Integrate**

- connectivity based on open and industry standards
- network integration (including VSE Connectors & SOA web services)

■ **Extend**

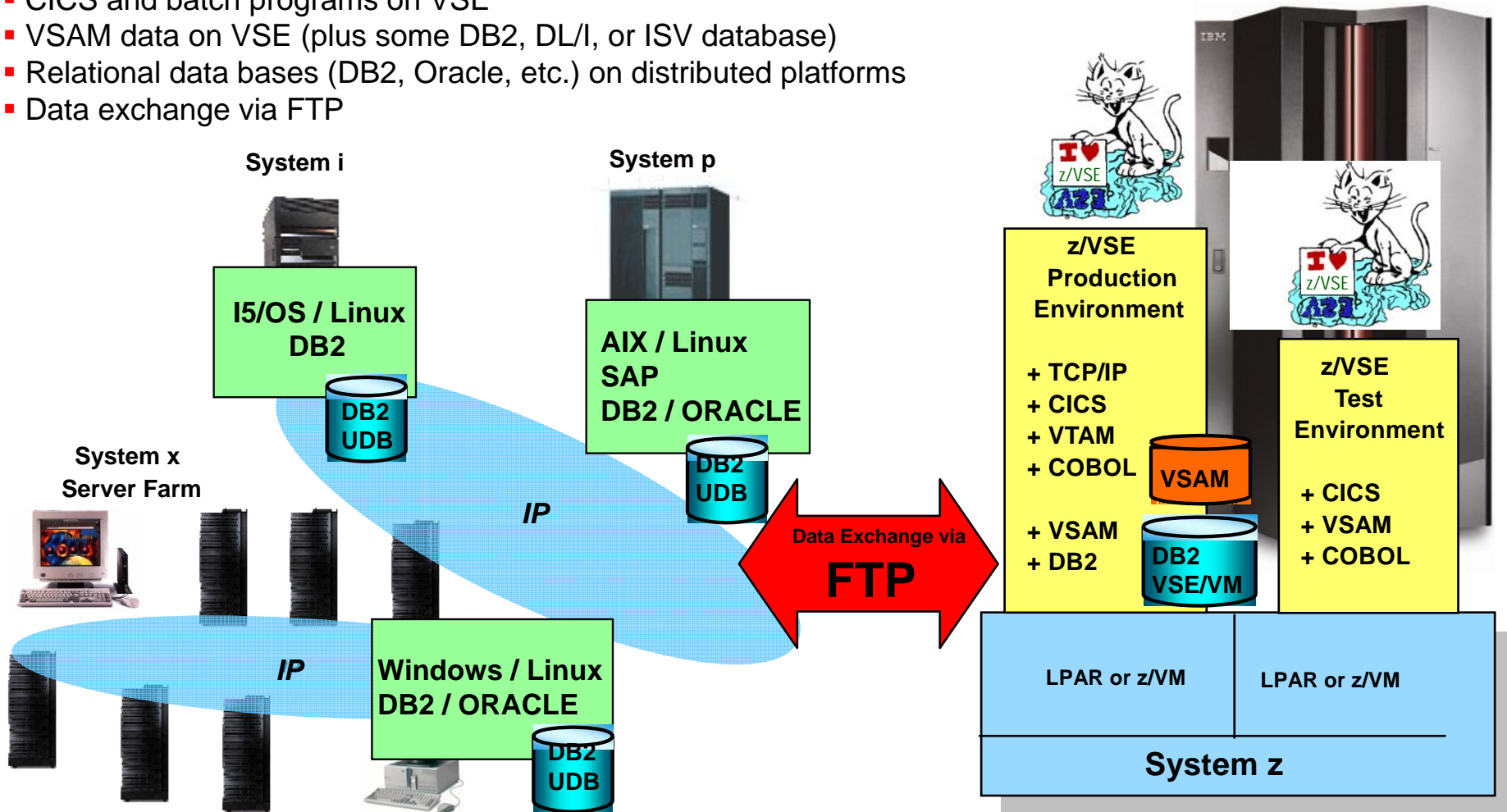
- integrate / exploit capabilities of Linux on IBM System z



z/VSE V4 and Linux on System z

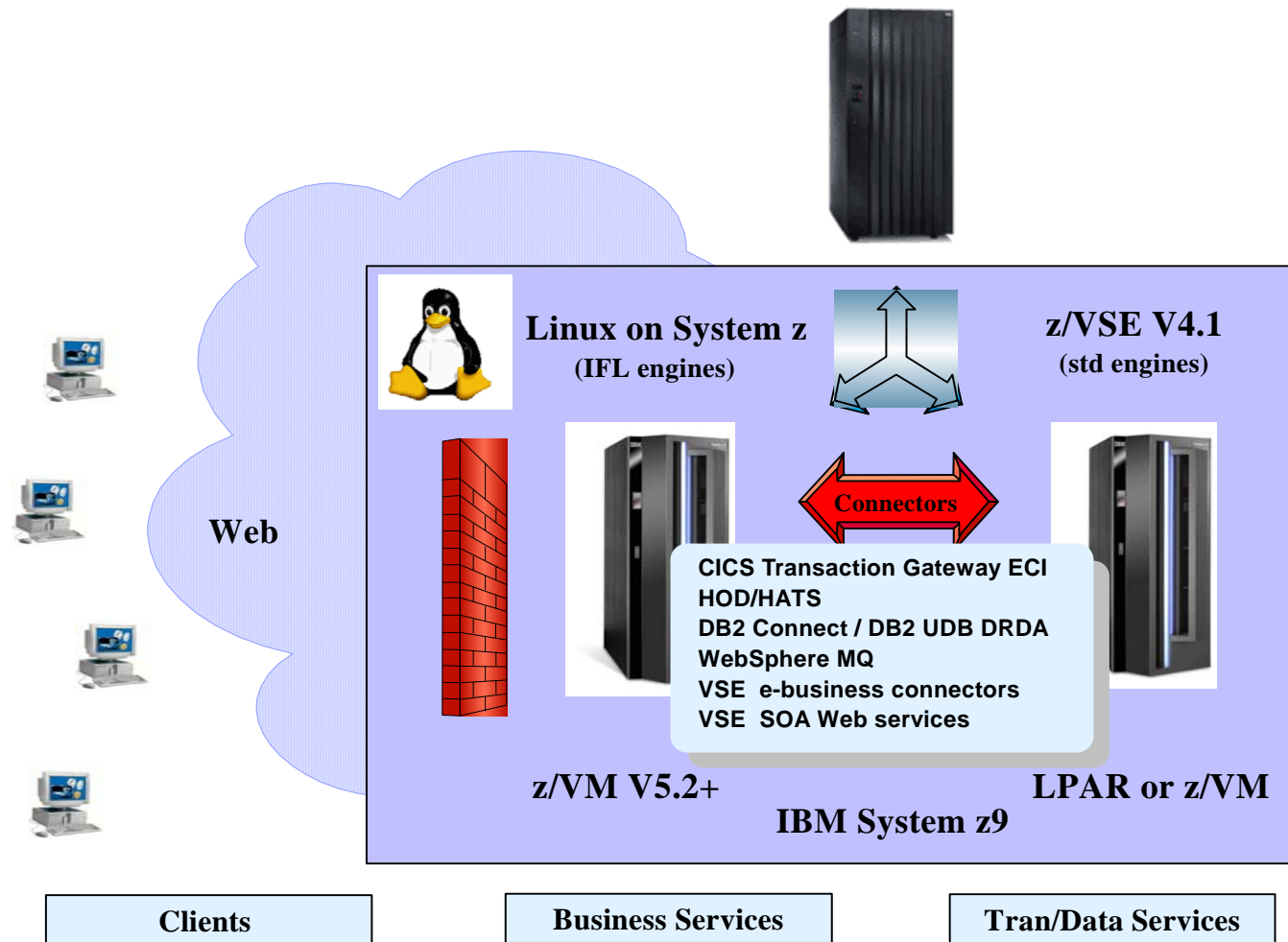
VSE Customer Environment

- Mixed servers (System z, System p, System x, System i, and competitive)
- CICS and batch programs on VSE
- VSAM data on VSE (plus some DB2, DL/I, or ISV database)
- Relational data bases (DB2, Oracle, etc.) on distributed platforms
- Data exchange via FTP

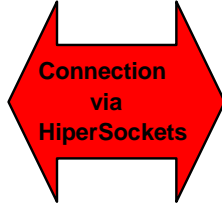
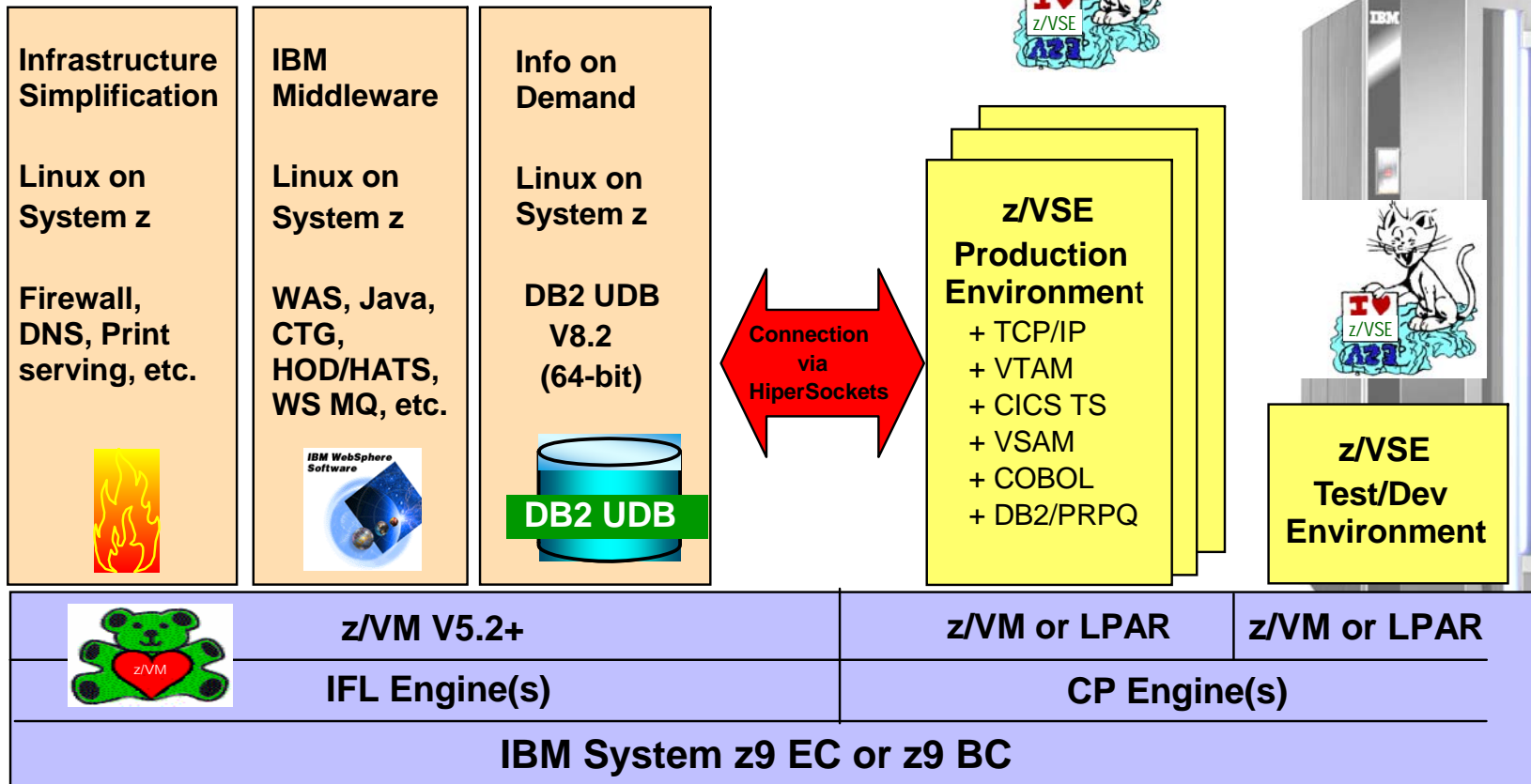


Most important requirement: Access to new applications!

Think *inside* the box

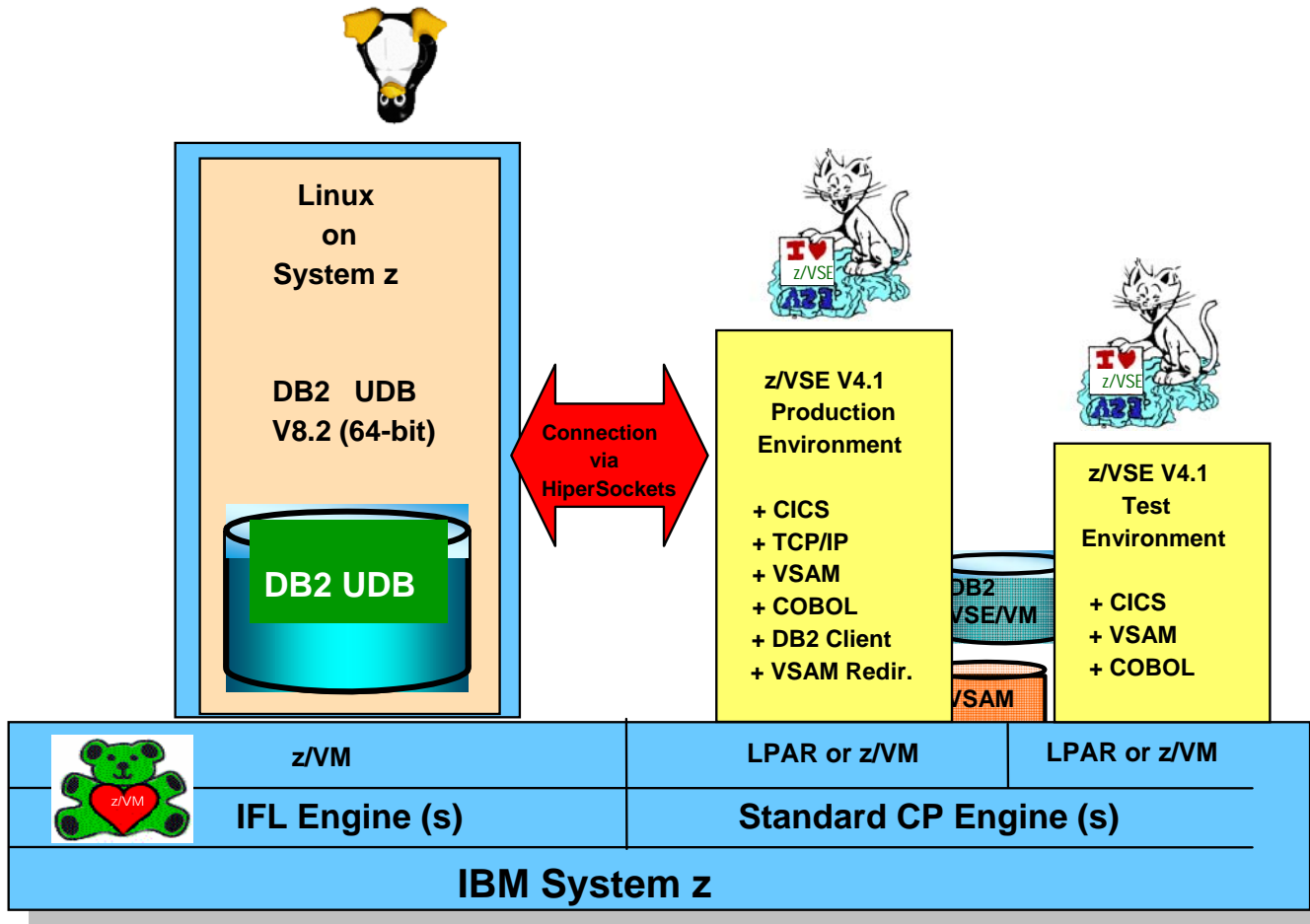


z/VSE V4 and Linux on System z



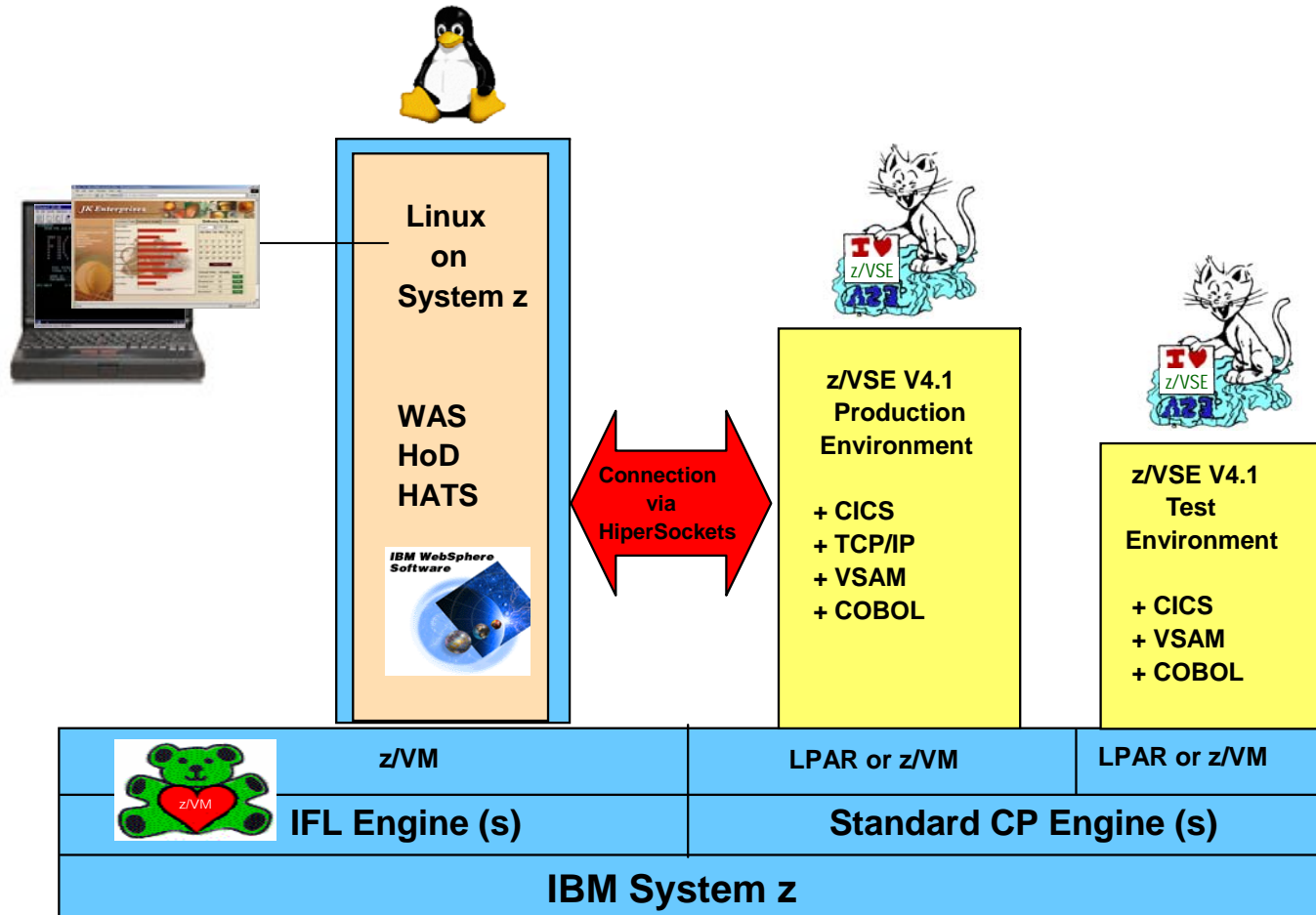
Scenario 1: DB2 UDB (64-bit) for VSE Customers

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



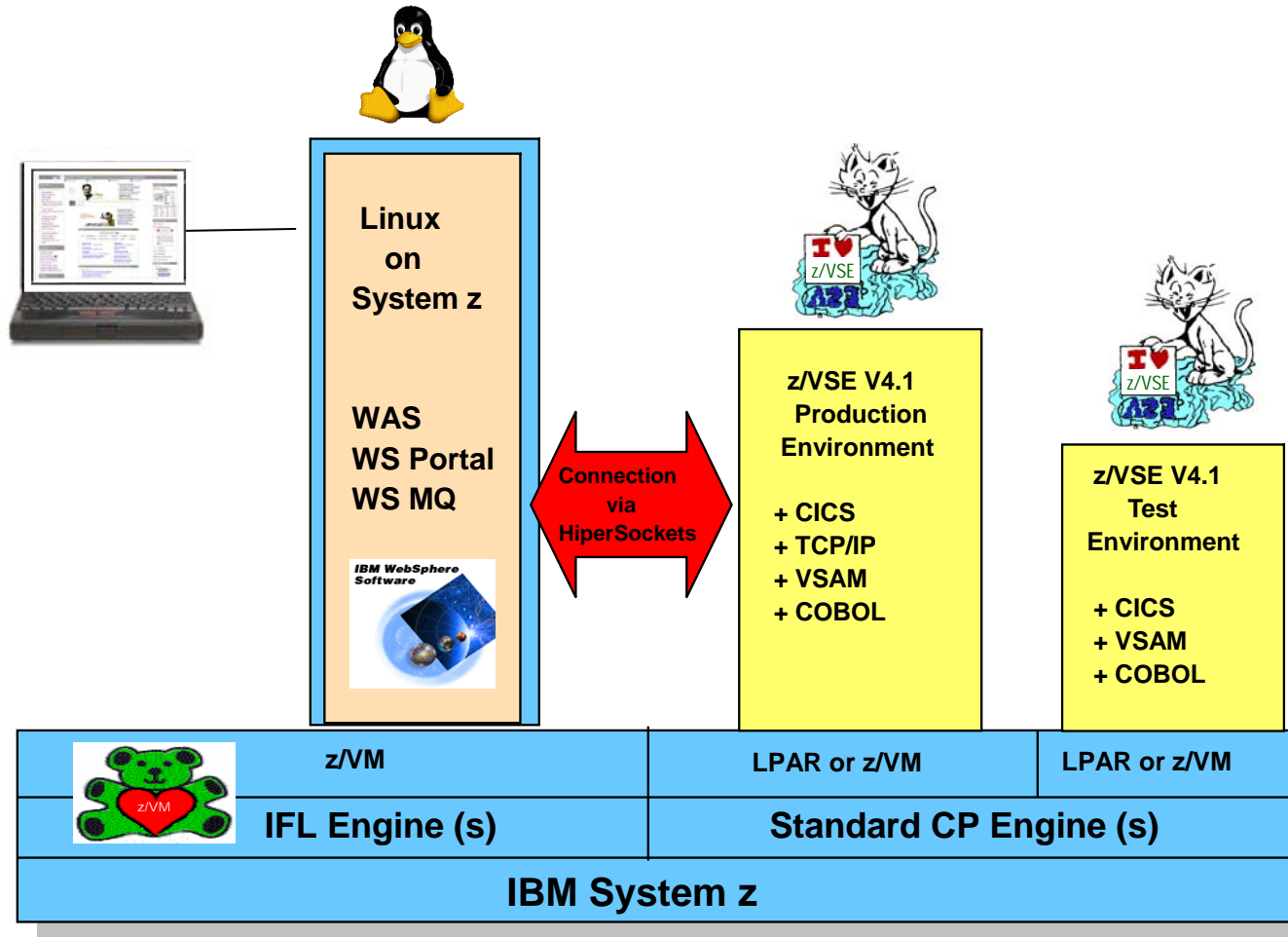
Scenario 2: „Webification“ of VSE Applications

Web enable existing applications with Internet / Intranet frontend



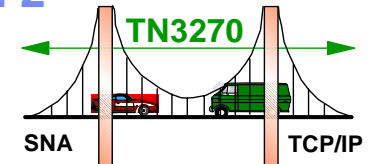
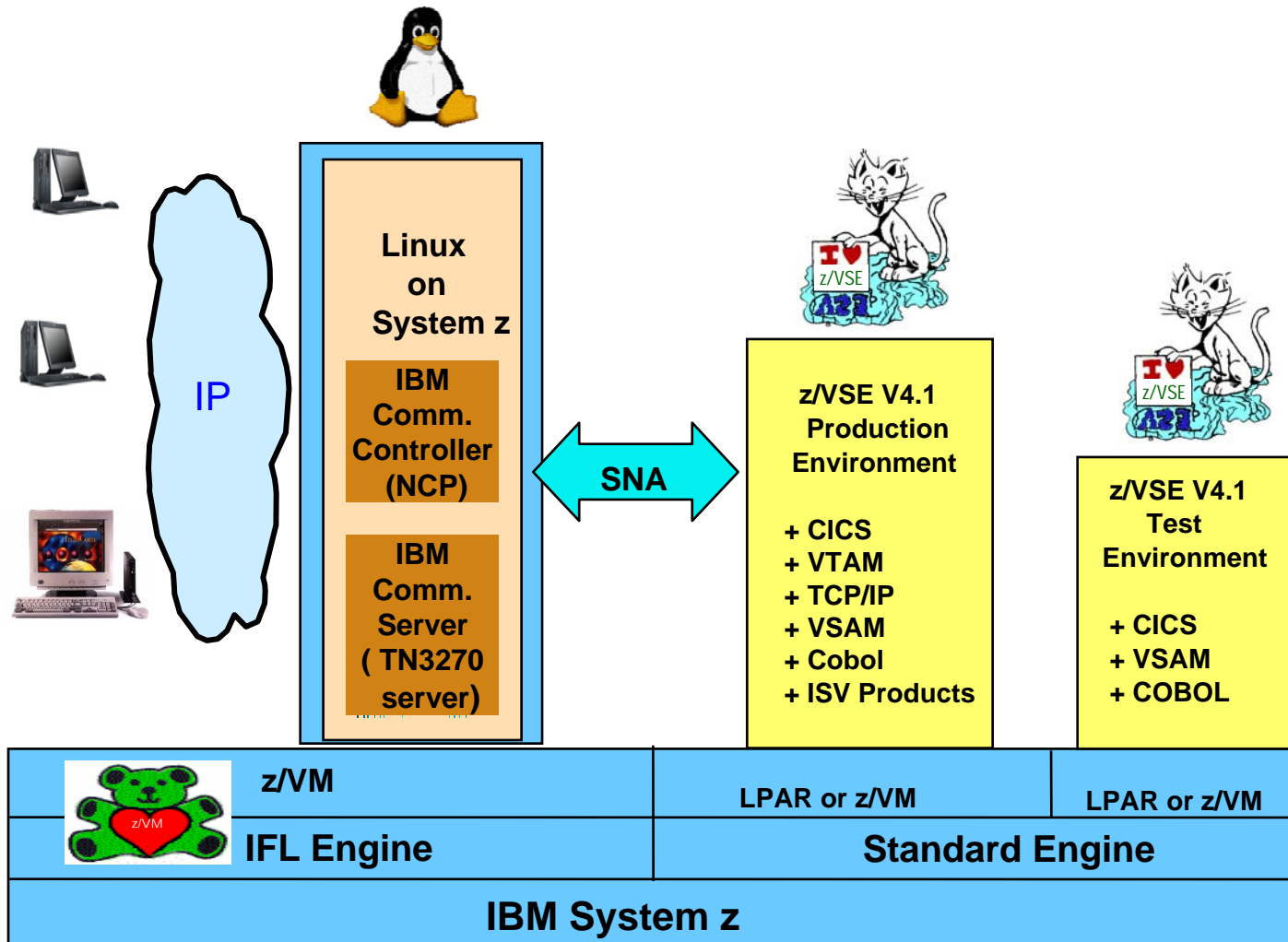
Scenario 3: WebSphere Portal for VSE Customers

Portal for administration and integration of employees / customers / partners



Scenario 4: Network Infrastructure Simplification

3745/46 (NCP) and TN3270 replacement with Linux on System z



Easy, high-value transition



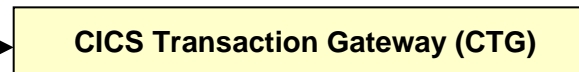
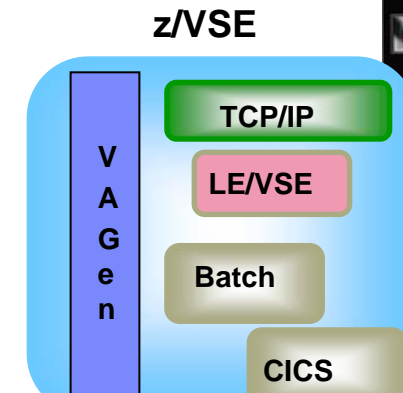
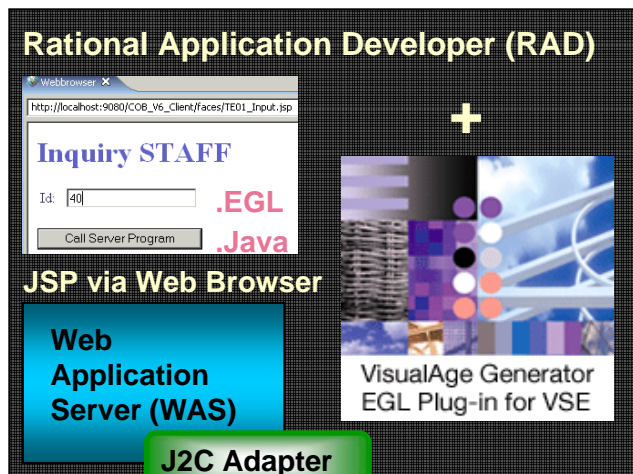
Scenario 5: Application Development for VSE

Modern, Cross Platform Application Development Environment



PC/Workstation

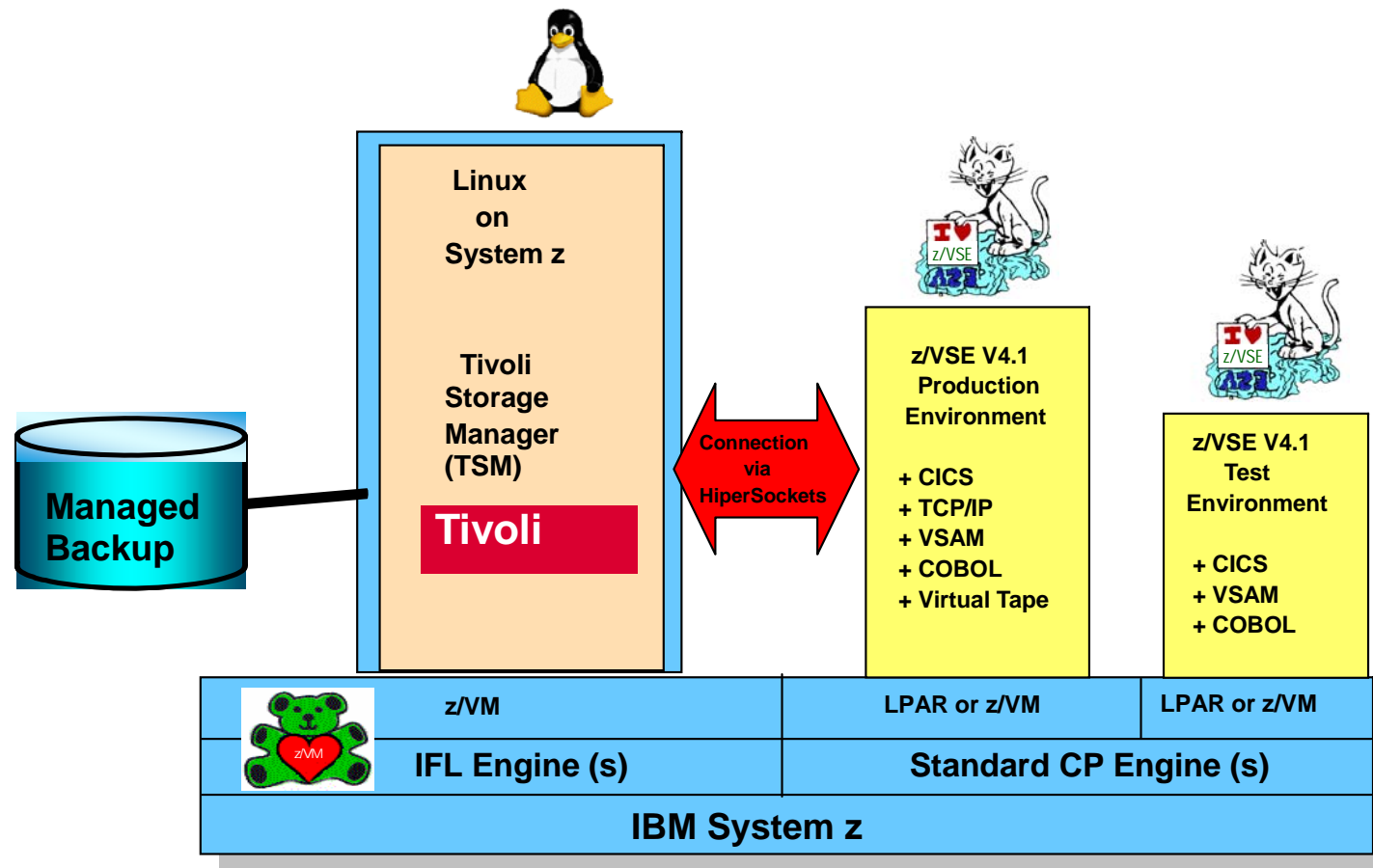
VisualAge Generator EGL Plug-in for VSE *



- WebSphere Application Server – the integration platform
- Enterprise Generation Language (EGL), Visual Age Generator
- Java™ 2 Platform, Enterprise Edition (J2EE) connection Architecture (J2C/JCA)
- Java Server Pages (JSP), as Front-End representation technology

Scenario 6: Backup/Restore Concepts for VSE

Integrate z/VSE with TSM on Linux on System z



Linux Advantages for z/VSE Customers

- **Linux applications based on IBM Middleware**

- WebSphere Application Server
- DB2 UDB
- Lotus® Domino™
- Communications Server
- advanced Application Development tools

- **Linux-based open source and/or ISV applications**

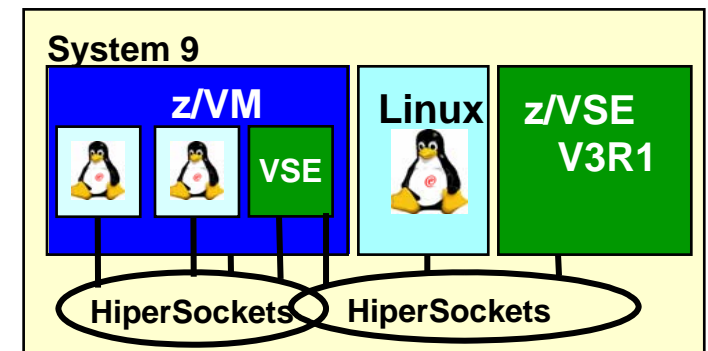
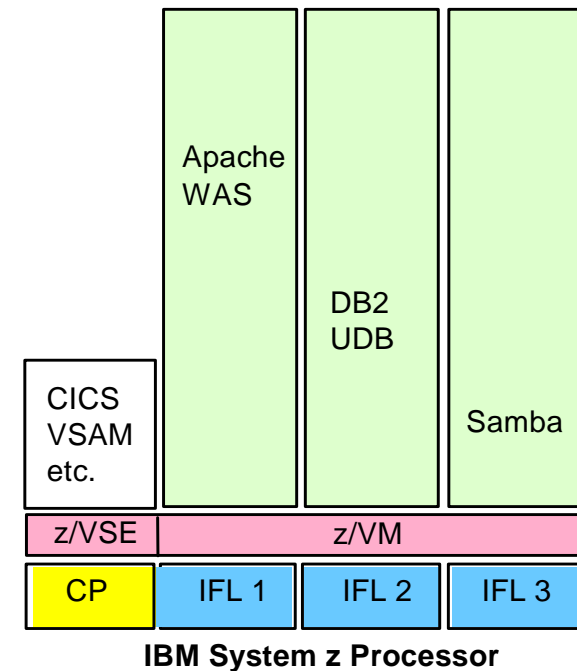
- Linux on System z exploits 64-bit capabilities
- Complement 31-bit core VSE applications

- **Integrate Linux and z/VSE solutions**

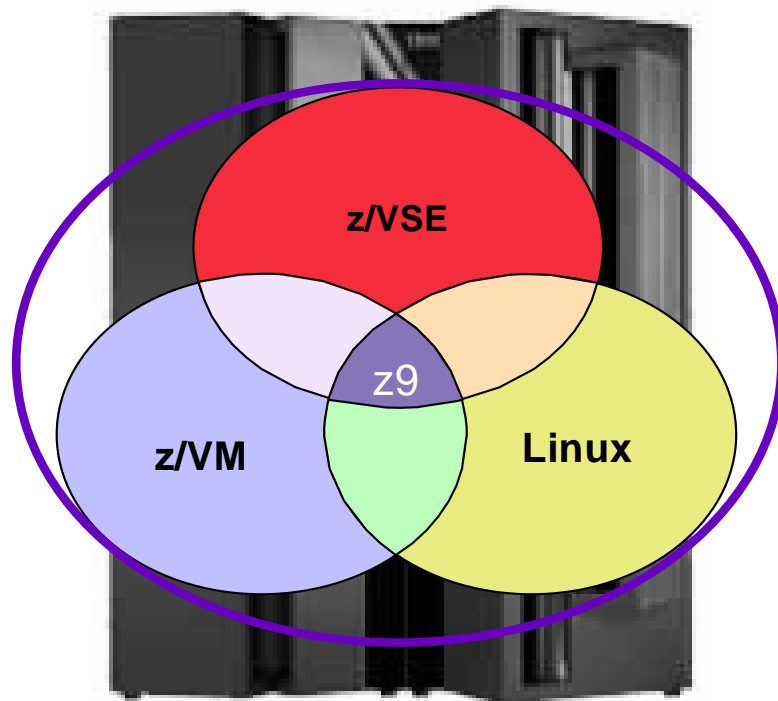
- Linux access to core z/VSE applications and data
- z/VSE access to new Linux applications and data

- **Infrastructure simplification**

- Consolidate existing distributed servers
- TCO benefits of Linux and System z



Exploiting the System z Platform



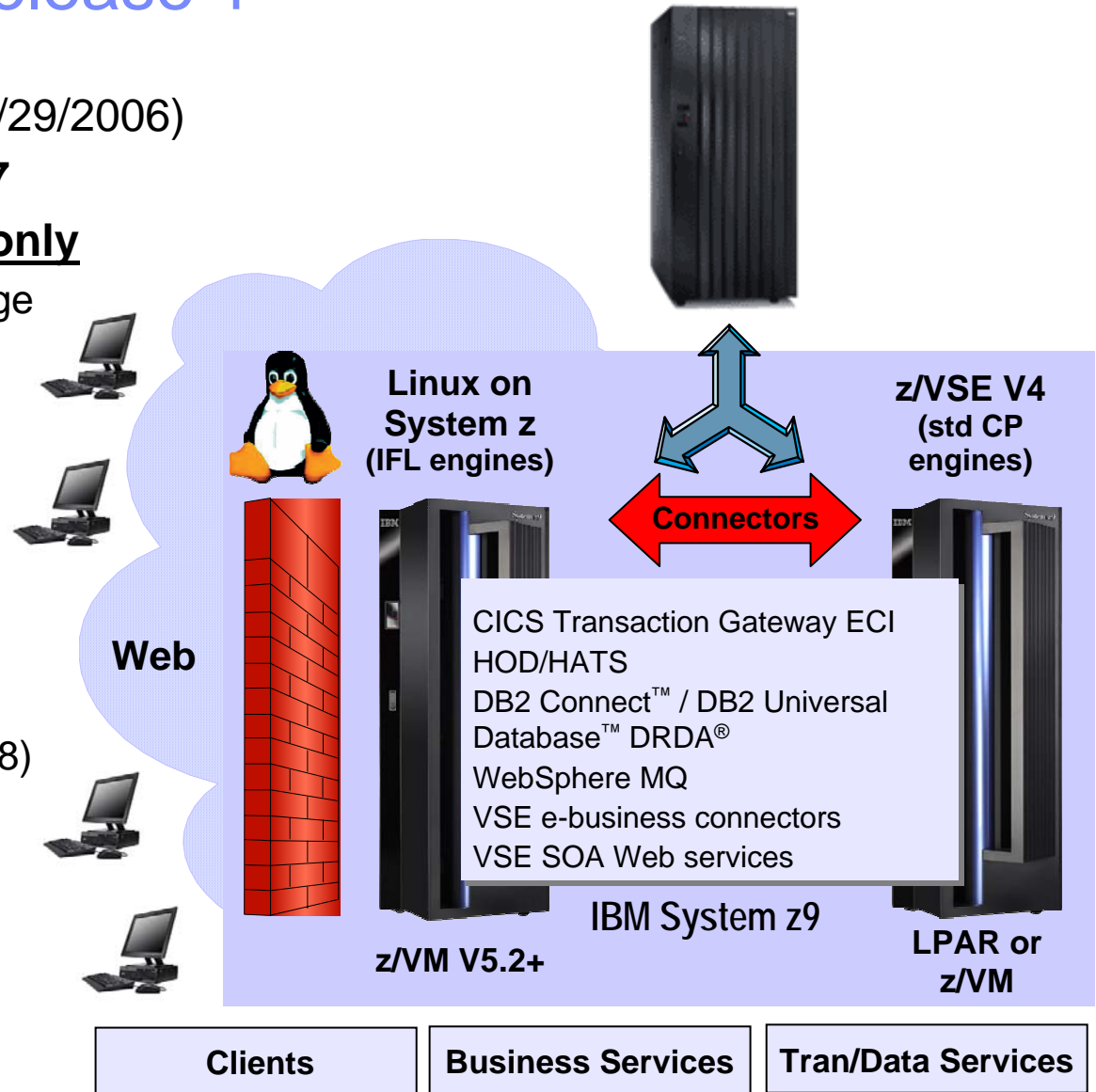
- **z/VSE** *designed to provide*
 - protection of core IT investments
 - robust, secure enterprise server
 - cost-effective solutions
 - interoperability with network/servers
 - z/OS affinity
- **Linux on System z**
 - large portfolio of new applications
 - platform for IBM middleware
 - infrastructure Simplification
 - massive scalability
- **z/VM** *designed to provide*
 - highly flexible, secure
 - robust, industrial strength
 - multiple VSE and Linux images
 - designed to exploit System z



Summary/Wrap-up

z/VSE Version 4 Release 1

- Announce 1/9/2007 (Preview 4/29/2006)
- **General Availability 3/16/2007**
- **z/Architecture (64-bit) mode only**
 - Up to 8 GB real processor storage
 - System z9 EC *and* z9 BC
 - zSeries 990, 890, 900, 800
- **New MWLC pricing metrics (z9 only)**
 - Low full capacity price points
 - Sub-capacity option
- **Encryption enhancements**
 - CPACF enhancements (AES-128)
 - Crypto Express2 (configurable)
 - TS1120 encrypting tape
 - SecureFTP
- **SOA and interoperability**

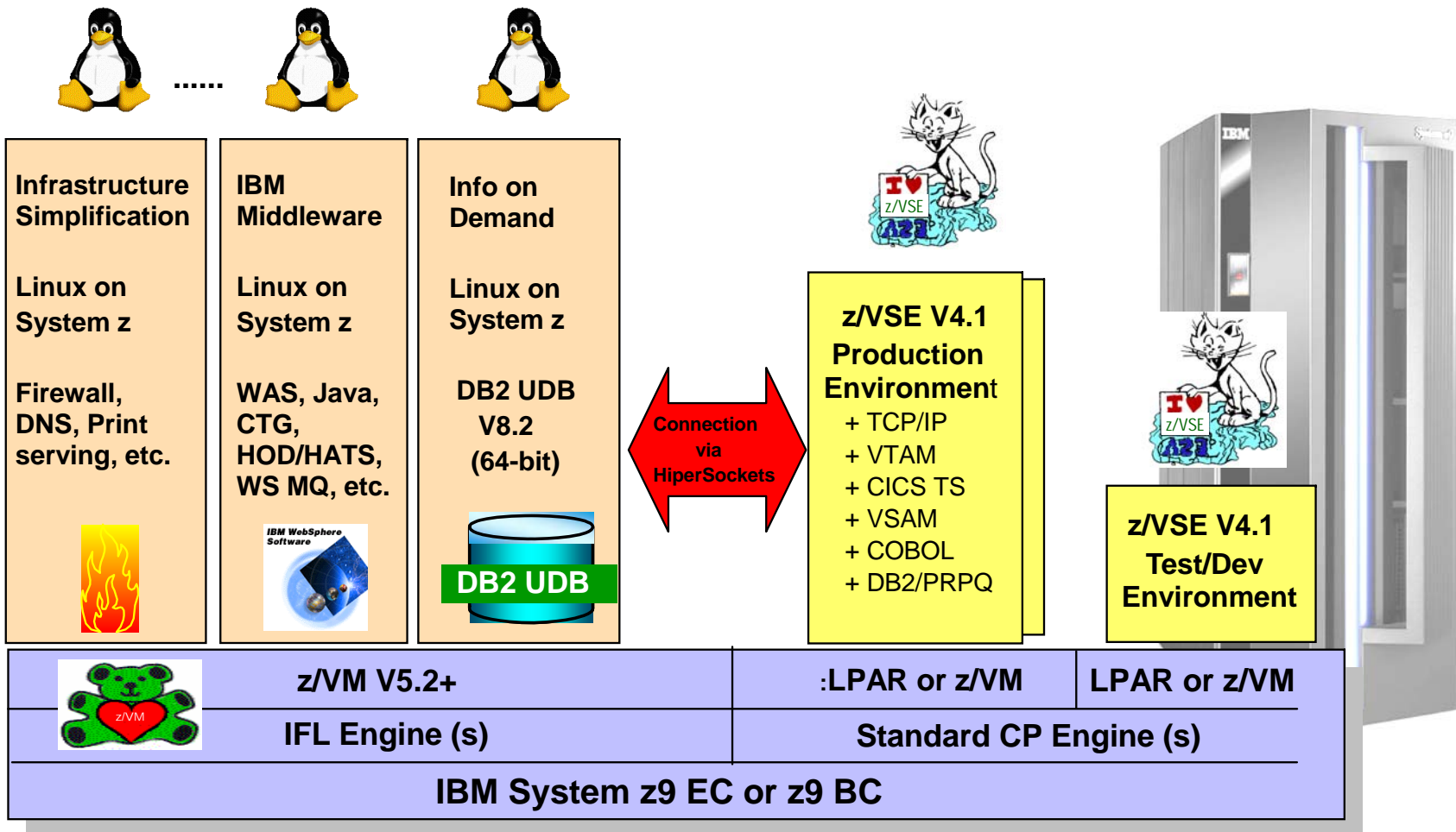


z/VSE “PIE” Strategy

- Help **P**rotect existing customer investments in core z/VSE programs, data, equipment, IT skills, *plus* business processes, end user training
 - Modernize, i.e. extend z/VSE resources to Web
 - Exploit IBM servers, storage, and software
 - z/OS affinity
- Help **I**ntegrate z/VSE with the rest of IT, based on open and industry standards
 - VSE connectors and SOA Web services
 - IBM middleware
- Help **E**xtend solutions with Linux on System z
 - Linux as preferred platform for new workloads
 - leverage existing core VSE investments
 - low cost, low risk, fast time-to-market
 - New line-of-business applications
 - Low TCO and infrastructure simplification



z/VSE V4 and Linux on System z



Thanks for listening



Your friends, the VSE development team

