

System z Expo

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Session Title: z/VSE News & Views

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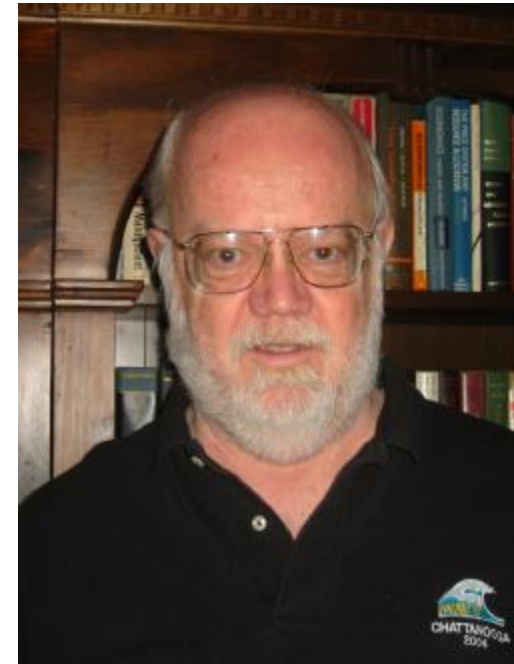
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Agenda

- § VSE Review
- § z/VSE Strategy
- § z/VSE Version 4 Release 2 (z/VSE V4.2)
 - Encryption Technology
- § Modernization Opportunities
- § MWLC Pricing
- § Wrap-up



G. M. (Jerry) Johnston





VSE Review

IBM Development Lab – Boeblingen, Germany



40+ Years of IBM Mainframe & VSE Evolution

§ S/360->S/370->4300->9370->ES9000->S/390->zSeries->z9->z10

§ 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 / z10 EC

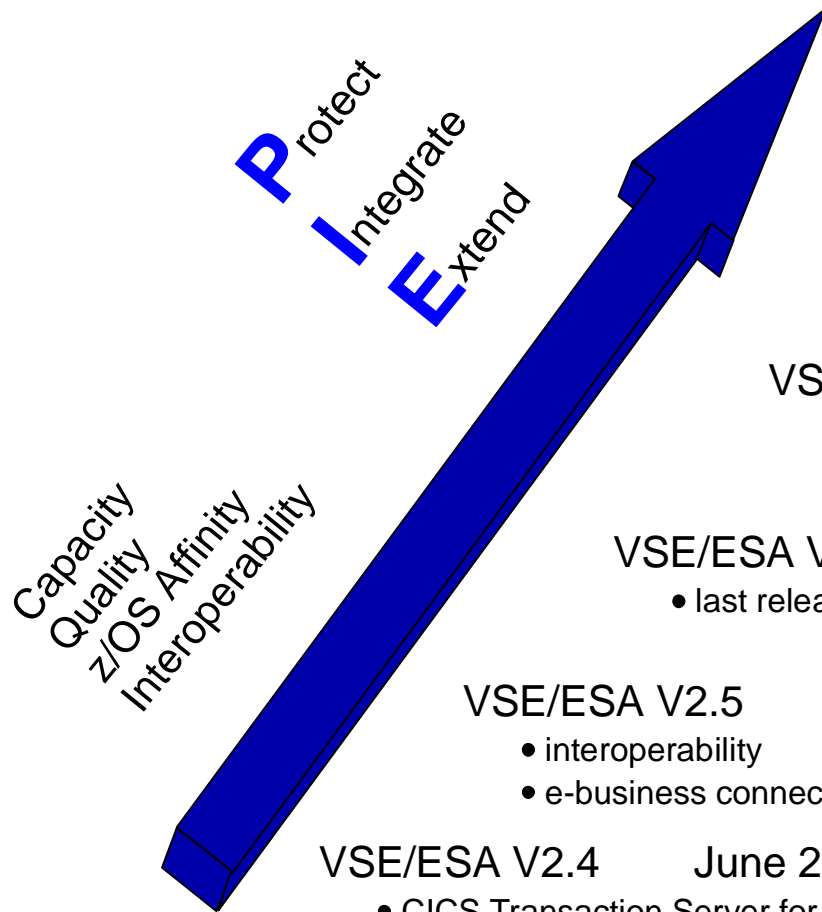
- 26 - 900+ MIPS (1-way)
- 8 GB - 1.5 TB

§ z/VSE V4.2

- Batch and OLTP
- SOA
- still lovable



Evolution



z/VSE V4.2 planned Oct 17, 2008

- More tasks, PAV, LDAP Client, SVC
- SoD for CICS/VSE

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

VSE/ESA V2.5 Sept 29, 2000

- interoperability
- e-business connectors

VSE/ESA V2.4 June 25, 1999

- CICS Transaction Server for VSE/ESA
- e-business

News in 2007 and 2008

- § 02/28/2007 - End-of-Service for VSE/ESA V2.7 effective
- § 03/16/2007 - z/VSE V4.1 General Availability
- § 03/16/2007 - SecureFTP PTF available
- § 05/18/2007 - IBM TS1120 encrypting tape PTF available for z/VSE V4.1
- § 06/18/2007 - IBM TS1120 encrypting tape PTF available for z/VSE V3.1
- § 06/29/2007 - z/VM V5.3 General Availability
- § 07/10/2007 - IBM TS3400 Tape Library attachment to System z
- § 08/07/2007 - End-of-Service for z/VSE V3.1 announced (effective 7/31/2009)
- § 08/09/2007 - DL/1 enhancement (up to 10 datasets for HD databases) available
- § 10/09/2007 - z/VSE V4.2 Preview
- § 10/09/2007 - Encryption Facility for z/VSE V1.1 announced (available 11/30/2007)
- § 10/10/2007 - SCRT V14.2 available for z/VSE V4.1
- § 11/14/2007 - IBM DB2 Server for VSE & VM V7.5 announced (available 11/30/2007)
- § 11/30/2007 - z/VSE V4.1.1 available
- § 01/18/2008 - z/VSE V3.1.3 available
- § 02/26/2008 - IBM System z10 Enterprise Class (z10 EC) announced
- § 05/31/2008 - End-of-Marketing for z/VSE V3.1 effective
- § 06/13/2008 – z/VSE V4.1.2 available
- § 06/24/2008 – HLASM for z/OS, z/VM, and z/VSE V1.6 announced
- § 08/05/2008 - z/VSE V4.2 (planned GA 10/17/2008) and z/VM V5.4 announced





z/VSE Strategy

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

- Grow and Modernize, i.e. extend z/VSE resources to Web
- Exploit IBM servers, storage, middleware, security/encryption & related technology
- z/OS affinity
- IBM Academic Initiative

§ Help **I**ntegrate z/VSE with the rest of IT, based on open and industry standards

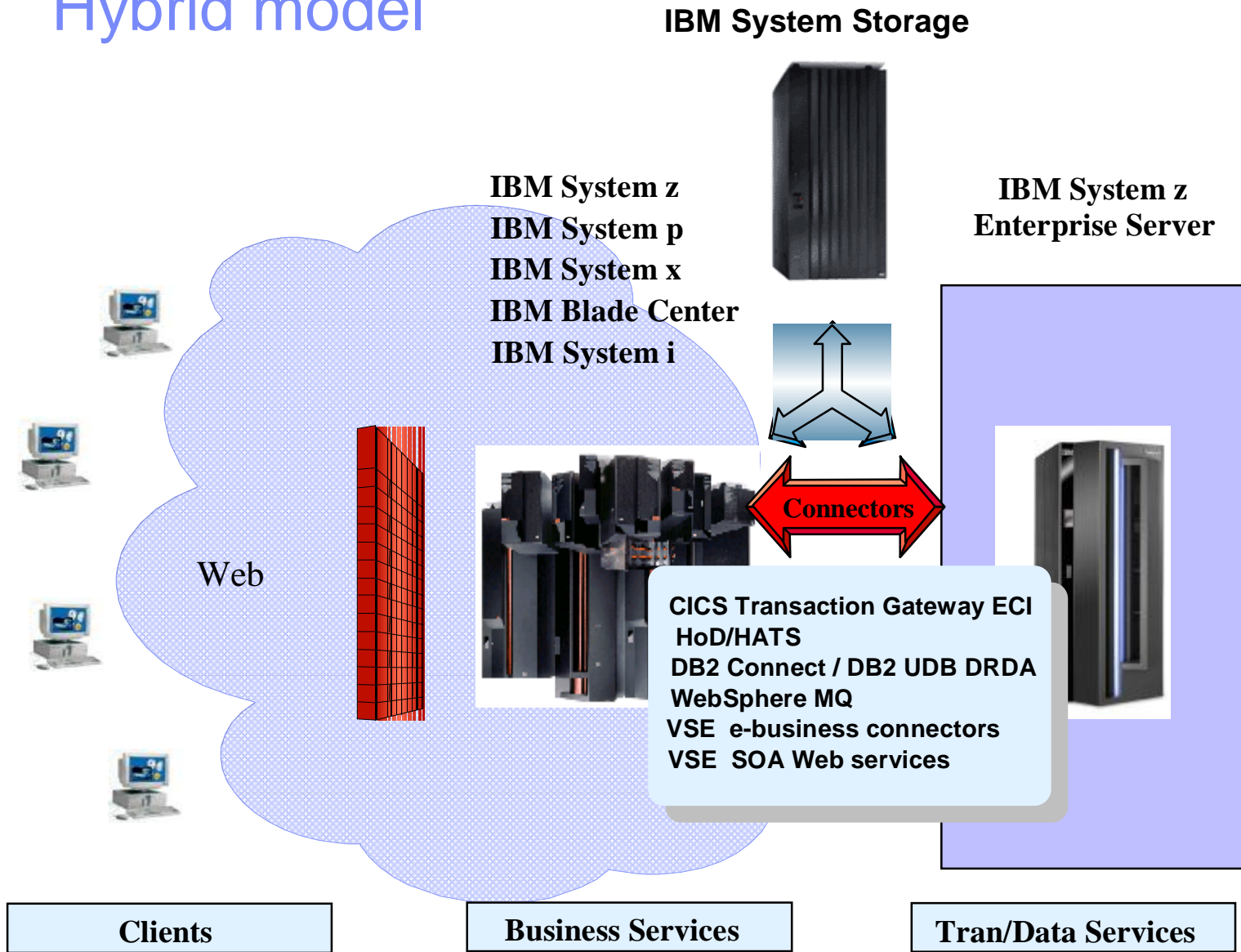
- VSE connectors and SOA Web services
- IBM middleware

§ Help **E**xtend solutions with Linux on System z

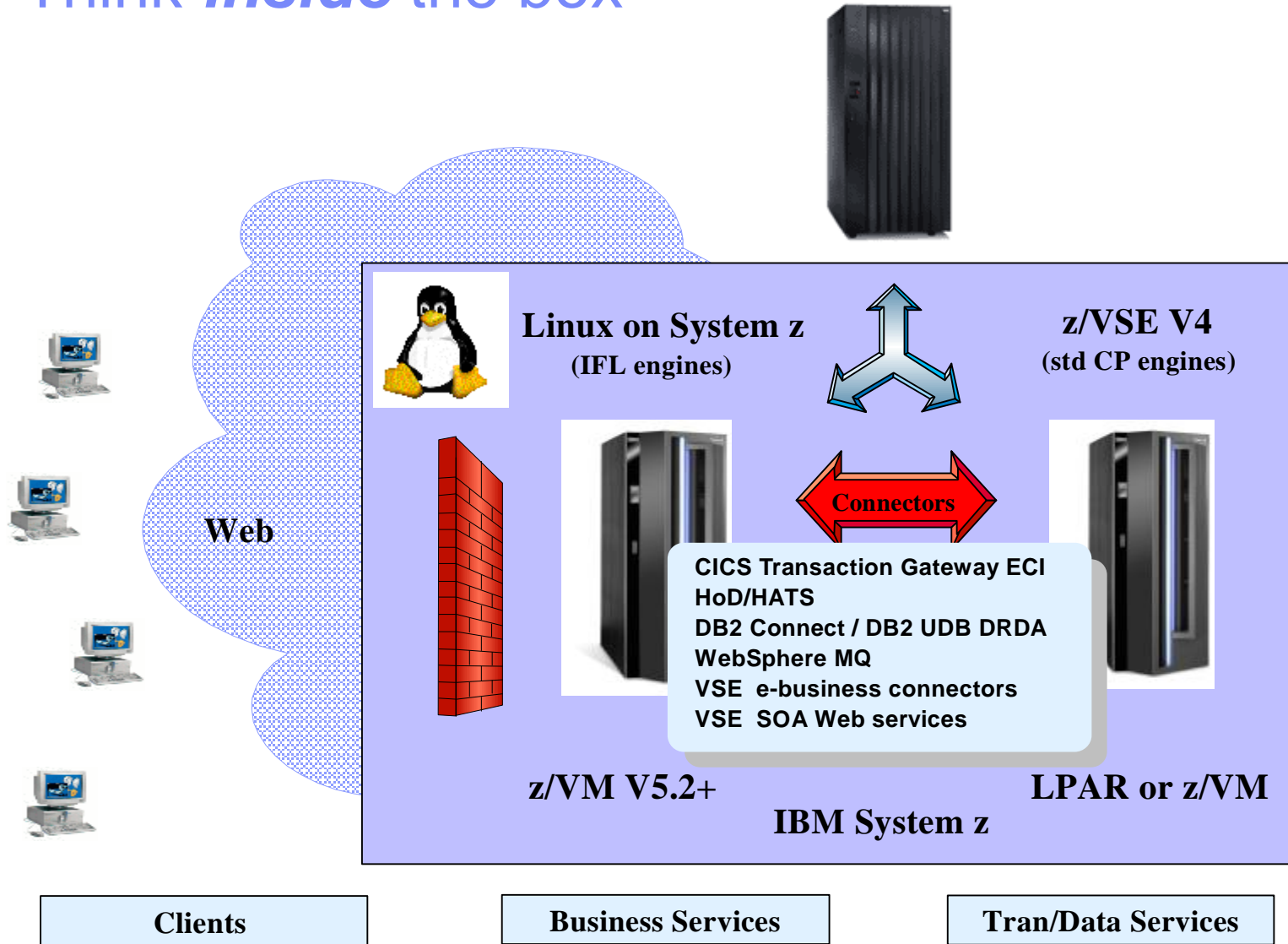
- Preferred platform for new workloads
 - leverage existing core VSE investments
 - low cost, low risk, fast time-to-market for new solutions
 - new line-of-business applications
- Low TCO and infrastructure simplification



Hybrid model

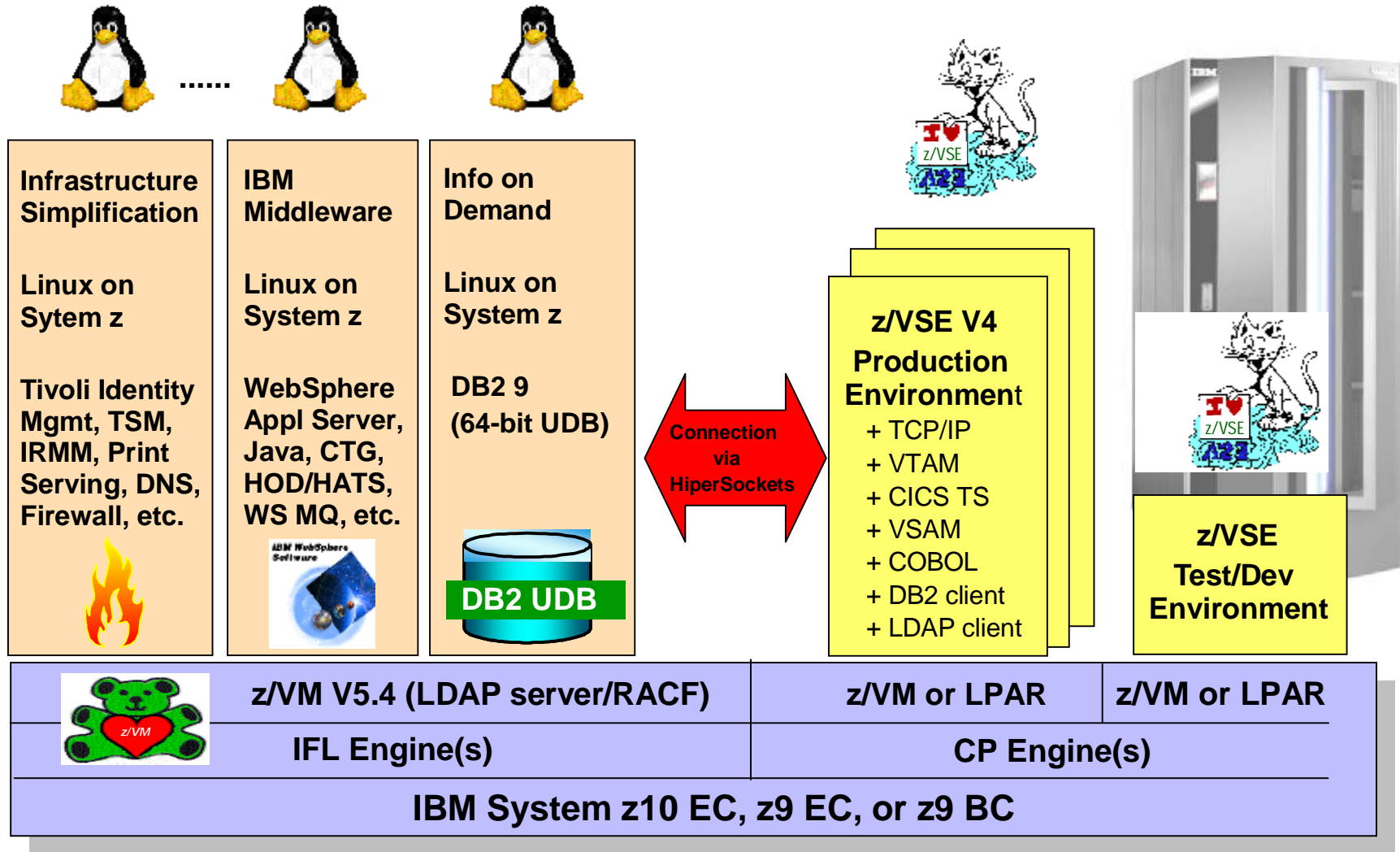


Think *inside* the box



z/VSE Vision

hybrid environment leveraging z/VSE V4, z/VM V5, and Linux on System z





z/VSE Version 4 Release 2



z/VSE V4.2 Contents



§ Servers

- IBM System z10 Enterprise Class (z10 EC)
- IBM System z9 Enterprise Class (z9 EC) and z9 Business Class (z9 BC)
- IBM eServer zSeries 990, 890, 900, and 800

§ Scalability

- [512 tasks \(2X z/VSE V4.1\)](#)
- up to 32 GB real processor storage (4X z/VSE V4.1)
- Turbo dispatcher enhancements (CP balancing)
- [Parallel Access Volumes \(PAV\)](#)
- IBM System Storage DS8000 SE Flashcopy

§ Security

- [Lightweight Directory Access Protocol \(LDAP\) sign-on support using a new z/VSE LDAP client](#)
- IBM System z10 extensions to CP Assist for Cryptographic Function (CPACF)
- SOA Message Layer and Transport layer security
- IBM System Storage TS1120 're-keying' function
- Basic Security Manager (BSM) improvements
- Encryption Facility for z/VSE V1.1 as an optional priced feature (also available for z/VSE V4.1)

z/VSE V4.2 Contents (continued)

§ Enhanced storage options

- IBM System Storage SAN Volume Controller (SVC) access to FCP-attached SCSI disks
- IBM System Storage TS3400 Tape Library and TS7700 Virtualization Engine Release 1.4

§ Pricing

- MWLC (full capacity or sub capacity options) eligible on z10 EC, z9 EC, and z9 BC
- ‘traditional’ price metrics for other servers

§ Migration

- Fast Service Upgrade (FSU) from z/VSE V4.1 and z/VSE V3.1

§ Virtualization

- Requires z/VM V5.2 or later if running under VM

§ Statement of Direction (SOD)

- z/VSE V4.2 will be the last version/release of VSE to ship CICS/VSE V2.3

§ Planned General Availability

- 10/17/2008



Enhancement 1: Additional Tasks

§ Up to 512 Concurrent VSE tasks

- 2X prior limit of 255
- long standing requirement from both customers and ISVs
- default remains 255
 - activate additional tasks system-wide using SYSDEF command
 - SYSDEF can be overwritten using JCL
- maximum 32 tasks per partition remains

§ Potential Benefits

- enables growing z/VSE workloads
 - more CICS and batch partitions can run in parallel
 - more workload in a single VSE image
- simplify environment
 - consolidate multiple VSE images
- may ease migration from CICS/VSE to CICS Transaction Server VSE/ESA
- opens additional opportunities
 - new IBM middleware
 - new ISV product offerings

Enhancement 2: Parallel Access Volumes (PAV)

§ Allows a z/VSE V4.2 host to access a single ECKD disk volume with multiple concurrent requests

- multiple addresses (alias) to a single logical device
- enables more than one I/O operation to a single logical device
- may reduce device queue delays
- volume sharing – not file sharing

§ Potential Performance Gain

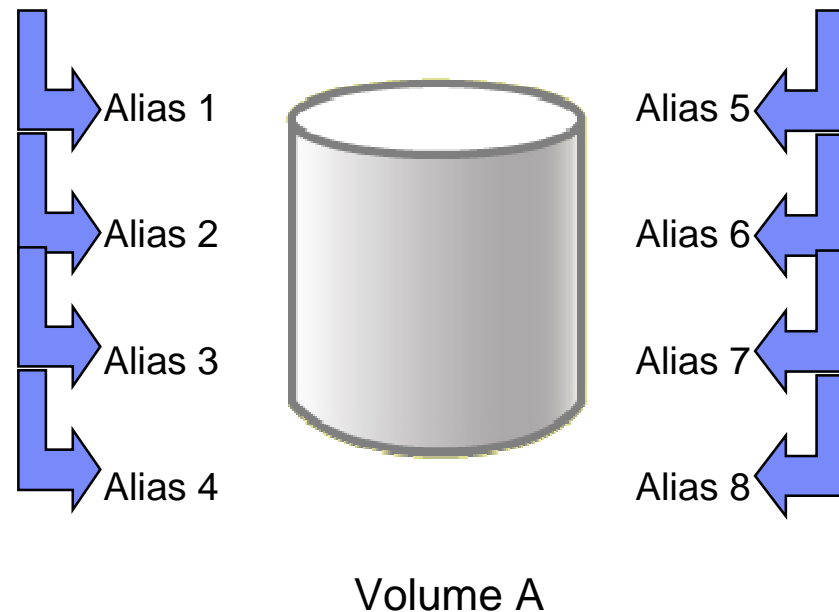
- multiple jobs, multiple partitions, CICS
- gains are highly dependent on workload

§ PAV Candidates

- VSAM catalogs, Shared Clusters, Libraries
- Spool files, work files, log files

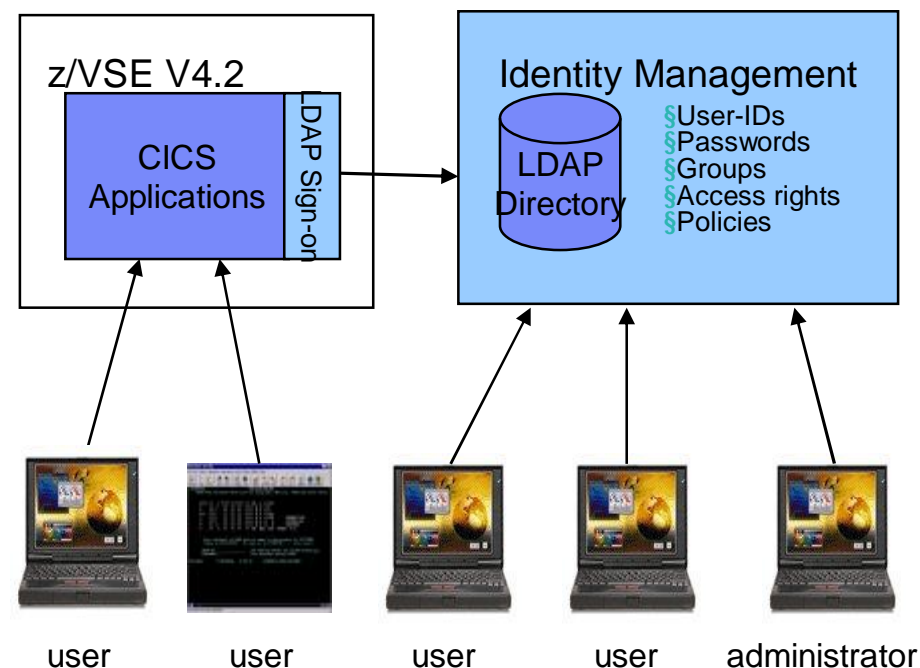
§ PAV is an optional, licensed feature of IBM DS8000, DS6000, and ESS

- no changes needed for application programs



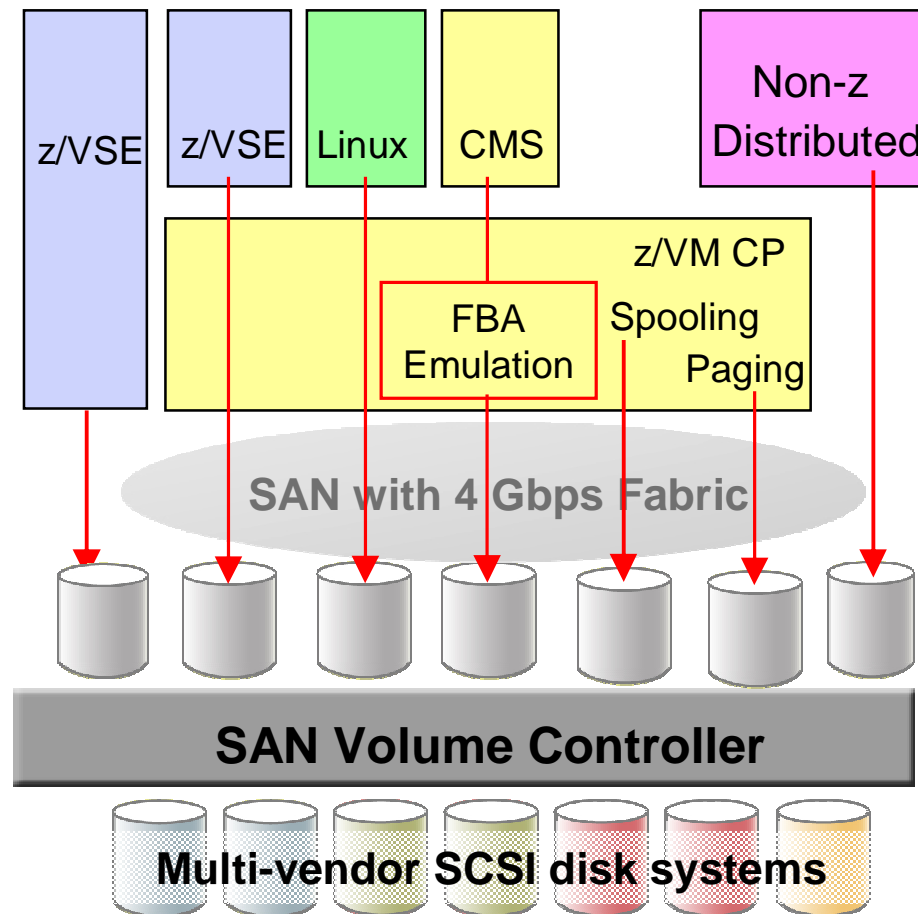
Enhancement 3: LDAP Client

- § Enables users to sign on to z/VSE using single, comprehensive, corporate-wide 'Identity Management' systems (i.e. IBM Tivoli Identity Manager, etc.)
- § LDAP user-IDs and passwords can be up to 64 characters. Helps overcome current VSE limits
 - 4 character VSE/ICCF user-IDs
 - 4 and 8 character CICS user-IDs
 - up to 8 character Passwords
- § LDAP sign on sits on top of existing z/VSE security manager (i.e. BSM, ESM, etc.)
- § z/VSE LDAP client can work with the common LDAP servers
 - IBM Tivoli Directory server
 - z/VM LDAP server (optional RACF repository)
 - Microsoft Active Directory, OpenLDAP, Apache Directory server, CA Directory, Novell eDirectory, and many others.



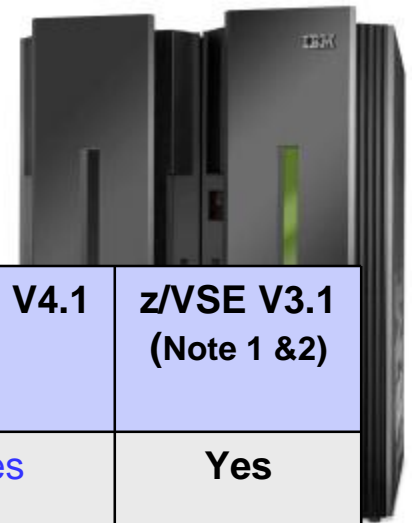
Enhancement 4: SAN Volume Controller

- § **SAN Volume Controller (SVC) creates a single pool of SCSI disk capacity**
- § **Disk storage options include IBM DS8000, DS6000, ESS, DS4000, etc. plus qualified systems from various non-IBM vendors**
- § **SVC *platform* includes both hardware and software components:**
 - SVC hardware 'nodes' provide redundant components plus cache
 - Systems Storage Productivity Center (SSPC) software provides administrative and copy services
- § **SVC helps create a simpler, more flexible, less costly disk storage infrastructure**
- § **Also supported in z/VM V5.3 and later, as well as Linux on System z**



Learn more at: ibm.com/storage/support/2145

z/VSE Support for Mainframe Servers



IBM Servers	z/VSE V4.2	z/VSE V4.1	z/VSE V3.1 (Note 1 & 2)
IBM System z10 Enterprise Class (z10 EC)	Yes	Yes	Yes
IBM System z9 Enterprise Class (z9 EC, formerly z9-109)	Yes	Yes	Yes
IBM System z9 Business Class (z9 BC)	Yes	Yes	Yes
IBM eServer zSeries 990, 890, 900, 800	Yes	Yes	Yes
S/390® Parallel Enterprise Server™ G5/G6	No	No	Yes
S/390® Multiprise® 3000	No	No	Yes

Note 1: z/VSE V3 can operate in 31-bit mode only. It does not implement z/Architecture and specifically does not implement 64-bit mode capabilities. z/VSE V3 is designed to support selected features of IBM System z hardware.

Note 2: z/VSE V3 support will end 7/31/2009;

z/VSE Status

VSE Version and Release	Marketed	Supported	End of Support
z/VSE V4.2	Yes... after 10/17/2008	Yes... after 10/17/2008	tbd
z/VSE V4.1	Yes .. EoM 10/17/2008	Yes	tbd
z/VSE V3.1	No	Yes ... until 7/31/2009	07/31/2009
VSE/ESA V2.7	No	No	02/28/2007



z/VSE Encryption Technology:

including TS1120 and Encryption Facility

System z Encryption Assists

§ CPACF

- Symmetric Encryption
 - used for encrypting 'bulk' data
- Additional instructions
- No charge feature on z990/890, z9 EC & z9 BC, and z10 EC

§ Crypto Express2

- Asymmetric Encryption (Public/Private key pair)
 - used in SSL session initiation
- Coprocessor Card
- Priced feature

Hardware Crypto Support on System z and VSE

by release

	z/VSE 4.2	z/VSE 4.1	z/VSE 3.1	VSE/ESA 2.7	VSE/ESA 2.6/5/4..
CPACF	Yes	Yes	Yes	-	-
PCICA	Yes	Yes	Yes	Yes	-
PCIXCC	Yes	Yes	-	-	-
CEX2C	Yes	Yes	Yes	-	-
CEX2A	Yes	Yes	Yes	-	-

	S/390	z800	z900	z890	z990	z9	z10
CPACF	-	-	-	Yes	Yes	Yes+	Yes++
PCICA	-	Yes	Yes	Yes	Yes	-	-
PCIXCC	-	-	-	Yes	Yes	-	-
CEX2C	-	-	-	Yes	Yes	Yes	Yes
CEX2A	-	-	-	-	-	Yes	Yes

by server



CEX2C = Crypto Express2 in coprocessor mode

CEX2A = Crypto Express2 in accelerator mode

See: <http://www.ibm.com/systems/z/security/cryptography.html>

IBM System z Exploitation

Functions	z/VSE V4.2	z/VSE V4.1	z/VSE V3.1
CP Assist for Cryptographic Function (i.e DES, TDES, etc.)	Yes	Yes	Yes
.....CPACF z9 extensions (i.e. AES 128-bit, etc.)	Yes	Yes	No
.....CPACF z10 extensions (i.e. AES 256-bit, etc.)	Yes	Yes	No
Crypto Express2 (SSL clear key encryption assist) – 2P & 1P	Yes	Yes	Yes
.....Crypto Express2 (configurable)	Yes	Yes	Yes
.....Crypto Express2 2048-bit RSA keys	Yes	Yes	No

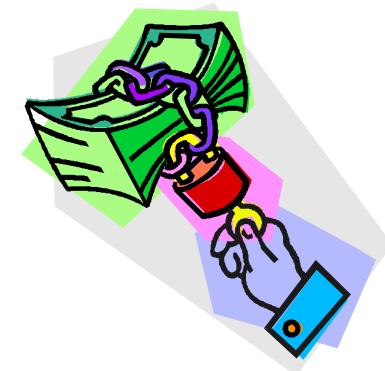
SSL for VSE

- § SSL is part of TCP/IP for VSE/ESA
- § Supports SSL 3.0 and TLS 1.0
 - Key exchange: RSA (asymmetric)
 - Data Encryption: DES and Triple DES, AES (symmetric)
 - Hash algorithm: MD5, SHA
 - Supports X.509v3 PKI Certificates
- § SSL daemon implementation for HTTPS, Telnet
- § SSL API compatible with the OS/390 SSL API
- § Transparently Uses Hardware Crypto acceleration *if available*



SecureFTP

- § The FTP protocol provides a easy and straight forward protocol for transferring files between systems on different platforms
 - Many installations rely on it to efficiently transmit critical files that can contain vital information such as customer names, credit card account numbers, social security numbers, corporate secrets and other sensitive information
 - FTP protocol transmits data without any authentication, privacy or integrity
- § **SecureFTP** provides user authentication, privacy and integrity by using RSA digitally signed certificates, DES encryption and SHA-1 secure hash functions
 - SecureFTP is integrated into TCP/IP for VSE/ESA with z/VSE V4.1 & later



IBM TS1120 Tape Drive Encryption

- § IBM System Storage TS1120 - first encrypting tape drive
 - Standard feature on new TS1120 tape drives
 - Supports “traditional” and “encrypted” modes of operation
 - encryption “disabled” unless otherwise specified
 - Implements data encryption using AES-256 encryption
 - Data is automatically compressed *then* encrypted – no change in media utilization
 - Encryption performed with minimal (< 1% data rate performance impact)

- § Systems Managed Encryption with z/VSE V4.2, V4.1 & V3.1

- § IBM Encryption Key Manager (EKM) for Java platform™
 - EKM stores and manages *labels* and *key encrypting keys*
 - runs on z/OS, AIX, Linux (incl System z), i5/OS, HP, Sun, & Windows
 - Secure TCP/IP connection between EKM and TS1120
 - ESM supplies data encrypting keys to TS1120 on request
 - TS1120 encrypts files using data encrypting key (DEK)
 - TS1120 stores *encrypted* data encrypting key on cartridge
 - DEK can be encrypted using two different KEKs



TS1120
500 GB
100 MB/sec

**Encryption Key
Manager**



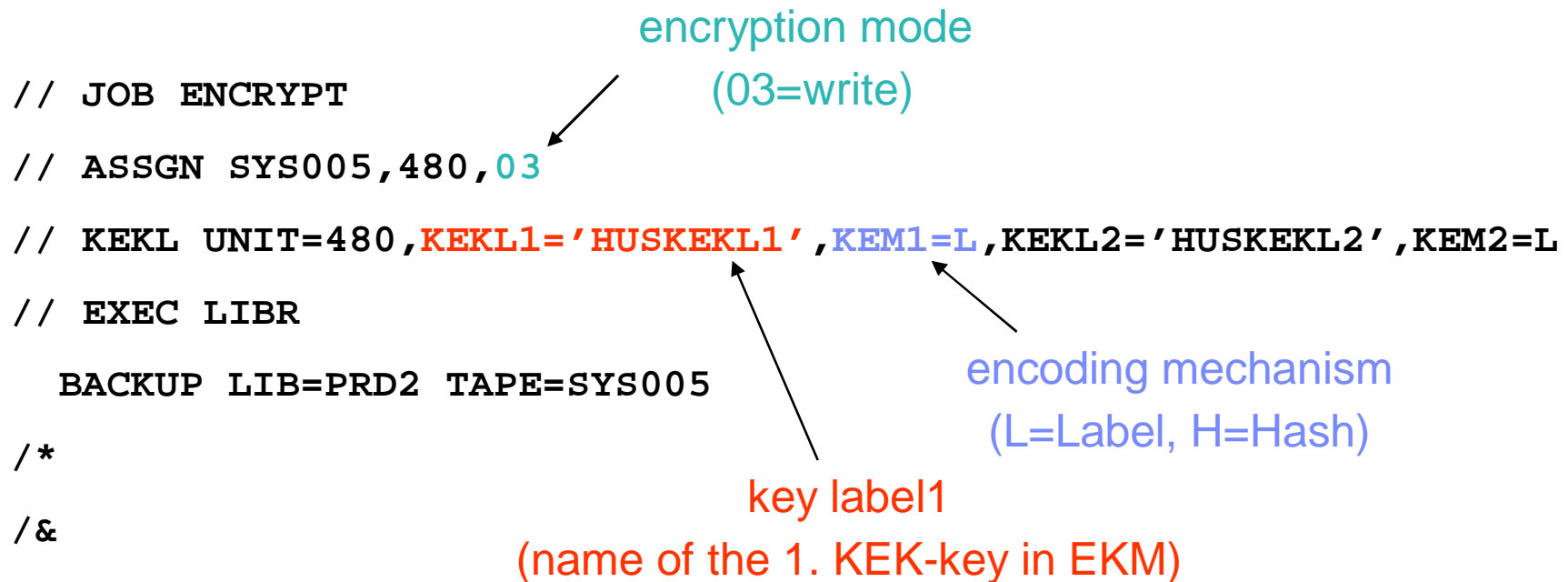
IBM Tape Encryption – TS1120

```
// JOB ENCRYPT
// ASSGN SYS005,480,03
// KEKL UNIT=480,KEKL1='HUSKEKL1',KEM1=L,KEKL2='HUSKEKL2',KEM2=L
// EXEC LIBR
  BACKUP LIB=PRD2 TAPE=SYS005
/*
/ &
```

encryption mode
(03=write)

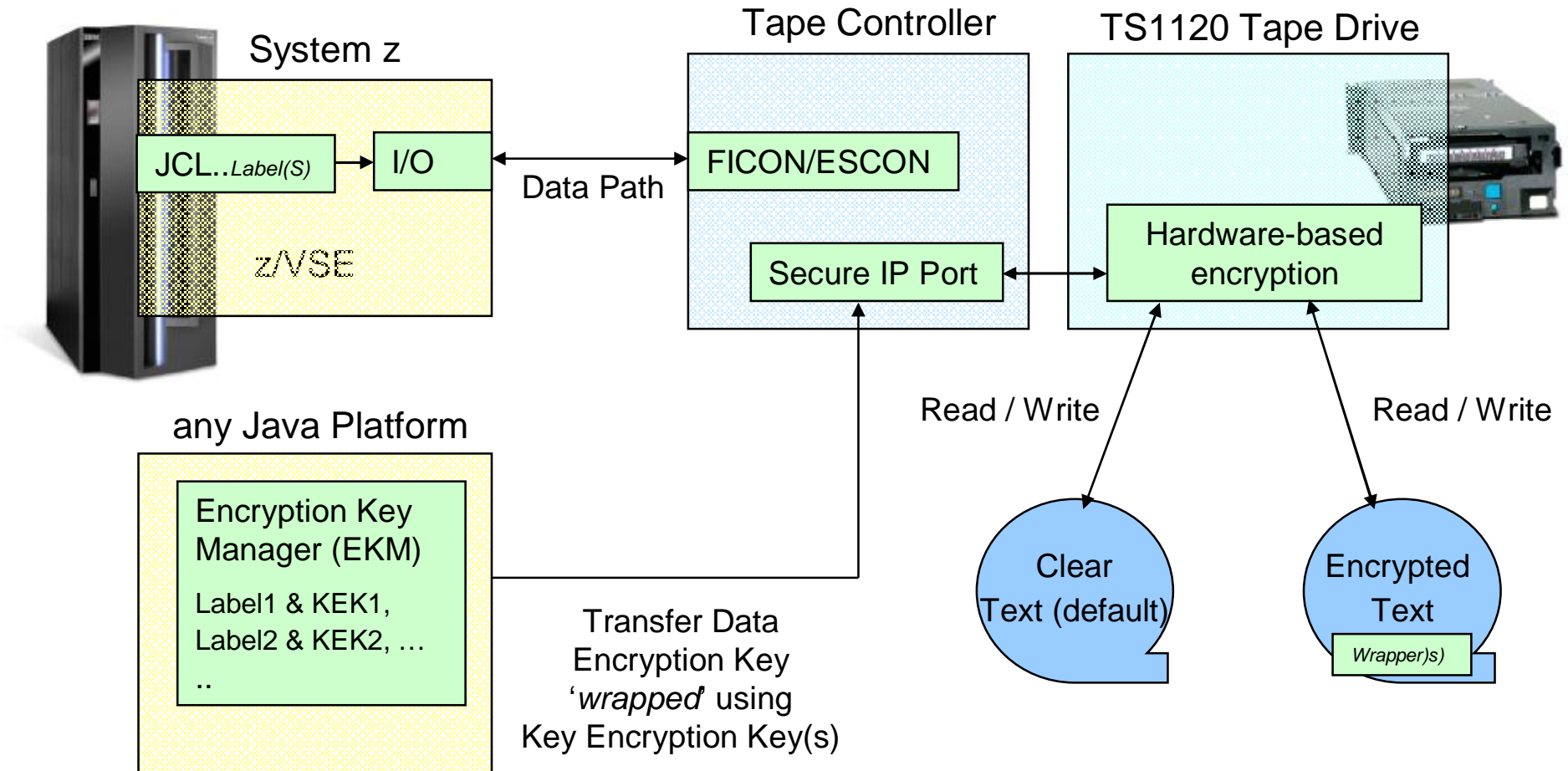
key label1
(name of the 1. KEK-key in EKM)

encoding mechanism
(L=Label, H=Hash)



- § The Data-Key can be encrypted using 2 different public keys (KEK = Key Encrypting Keys), to be able to send the tape to 2 different receivers
- § More info can be found in the *z/VSE 4.1 Administration* manual (VSE Homepage)

IBM Tape Encryption – TS1120

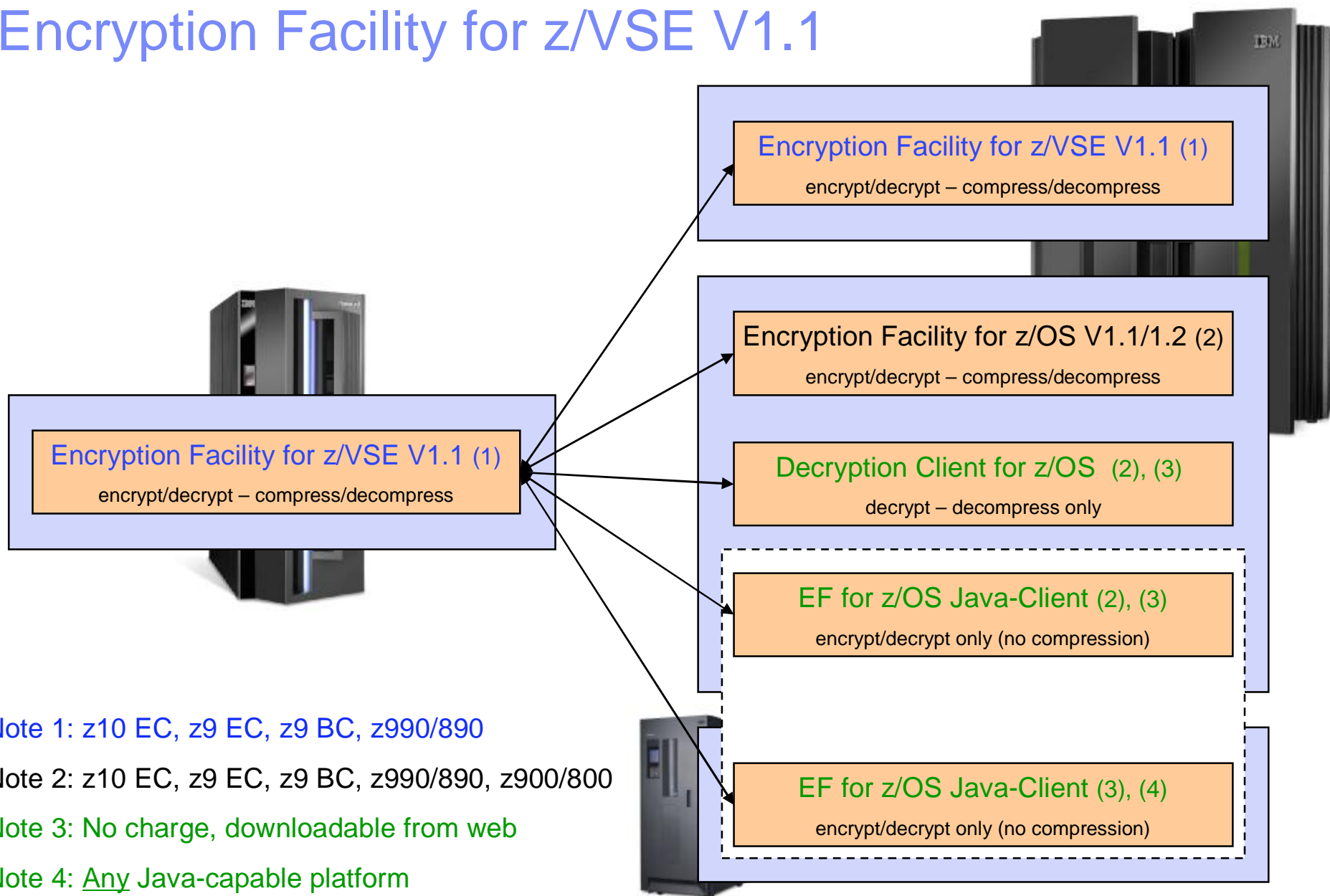


Encryption Facility for z/VSE V1.1

- § Announce: 10/09/2007 GA: 11/30/2007
- § Optional priced feature for VSE Central Functions V8
 - requires z/VSE V4.1 or later
 - MWLC-eligible
- § Requires CP Assist for Cryptographic Function (CPACF)
 - CPACF is a no charge feature only on z10 EC, z9 EC, z9 BC, z990 and z890 servers
- § Protection using Password-based or RSA-based (Public/Private) Key Encrypting Keys
 - TCP/IP for VSE/ESA V1.5 required for RSA-based keys
 - KEYMAN (or equivalent) no charge, downloadable tool recommended for RSA-based keys
- § Option to compress data (**compression must occur prior to encryption**)
- § Extends affinity between z/VSE and z/OS
 - function roughly equivalent to EF for z/OS V1.1
 - data format compatible with EF for z/OS V1.1/1.2 (Encryption Facility System z format)
 - EF for z/VSE tapes can be read by EF for z/OS, EF for z/OS Java Client, and Decryption Client for z/OS
 - EF for z/OS V1.1 and EF for z/OS Java client tapes can be read by EF for z/VSE V1.1
- § Complements z/VSE support for IBM TS1120 tape
 - *TS1120 is the preferred solution for high volume backup/archive*
 - *EF option for limited backup/archive and/or exchange with partners who have no TS1120*



Encryption Facility for z/VSE V1.1



Note 1: z10 EC, z9 EC, z9 BC, z990/890

Note 2: z10 EC, z9 EC, z9 BC, z990/890, z900/800

Note 3: No charge, downloadable from web

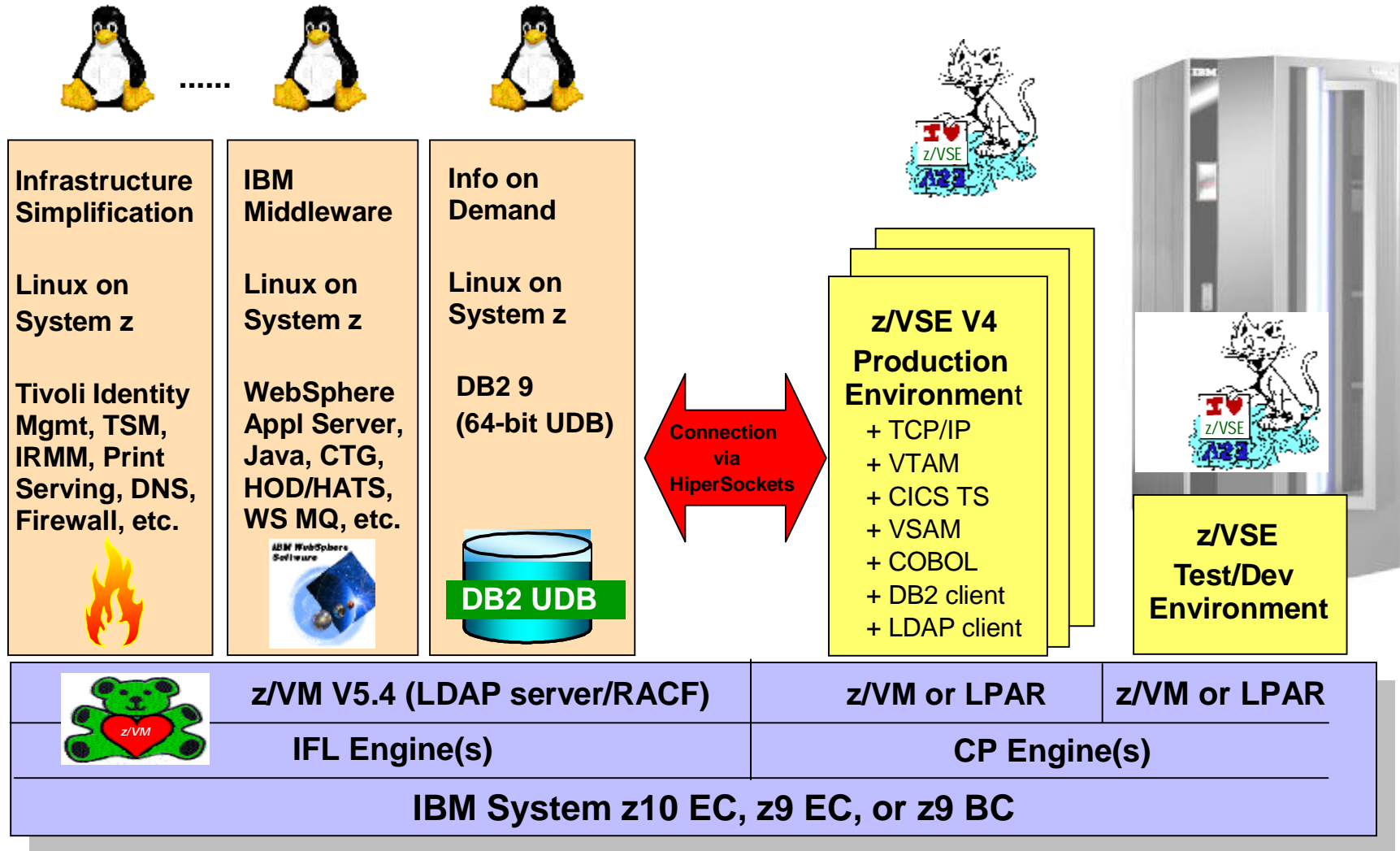
Note 4: Any Java-capable platform



z/VSE Modernization Options

z/VSE Vision

hybrid environment leveraging z/VSE V4, z/VM V5, and Linux on System z



z/VSE SOA and Interoperability

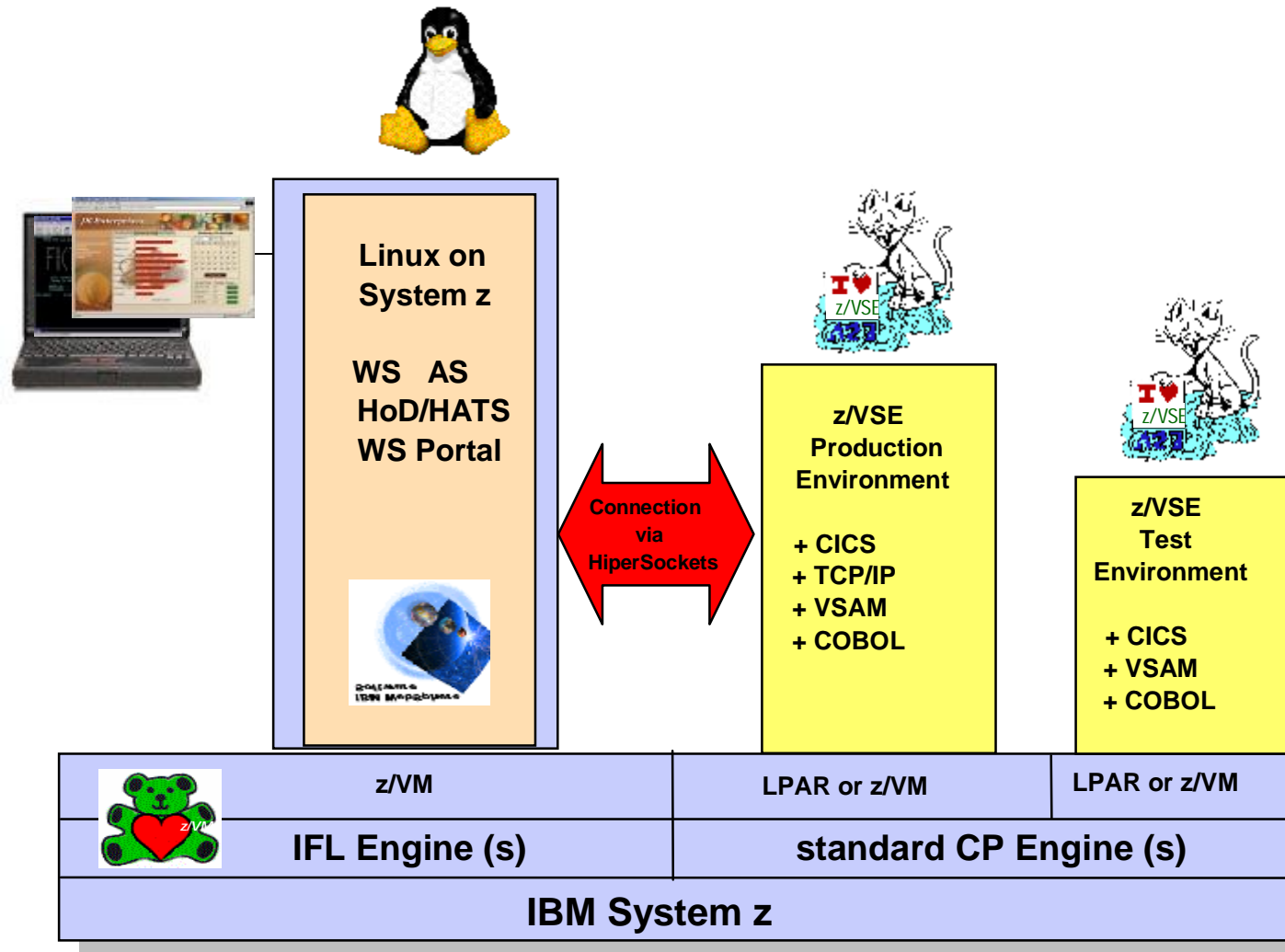
Connector Functions	z/VSE V4.2	z/VSE V4.1	z/VSE V3.1 (Note 1 & 2)
VSE Connectors (no additional charge)			
VSAM, POWER, Librarian, ICCF lib, console	Yes	Yes	Yes
VSAM Redirector	Yes	Yes	Yes
SOA Web Services, i.e. SOAP and XML	Yes	Yes	Yes
VSE Script and DL/1	Yes	Yes	Yes
DB2 Stored Procedures for VSAM and DL/1	Yes	Yes	Yes
VTAPE interface to IBM Tivoli Storage Manager (TSM)	Yes	Yes	Yes
LDAP client (LDAP server on another platform required)	Yes		
IBM Middleware (priced)			
CICS Transaction Gateway ECI	Yes	Yes	Yes
Host on Demand / Host Application Transformation	Yes	Yes	Yes
DB2 Connect/DB2 UDB (DB2 Server for VSE V7.5 Client)	Yes	Yes	Yes
WebSphere MQ (VSE Client no charge)	Yes	Yes	Yes

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Note 2: z/VSE V3 service ends 7/31/2009

Scenario 1: Enhance Core VSE Applications

Web enable, improve interface, simplify, extend existing applications



Host Access Transformation Server (HATS)

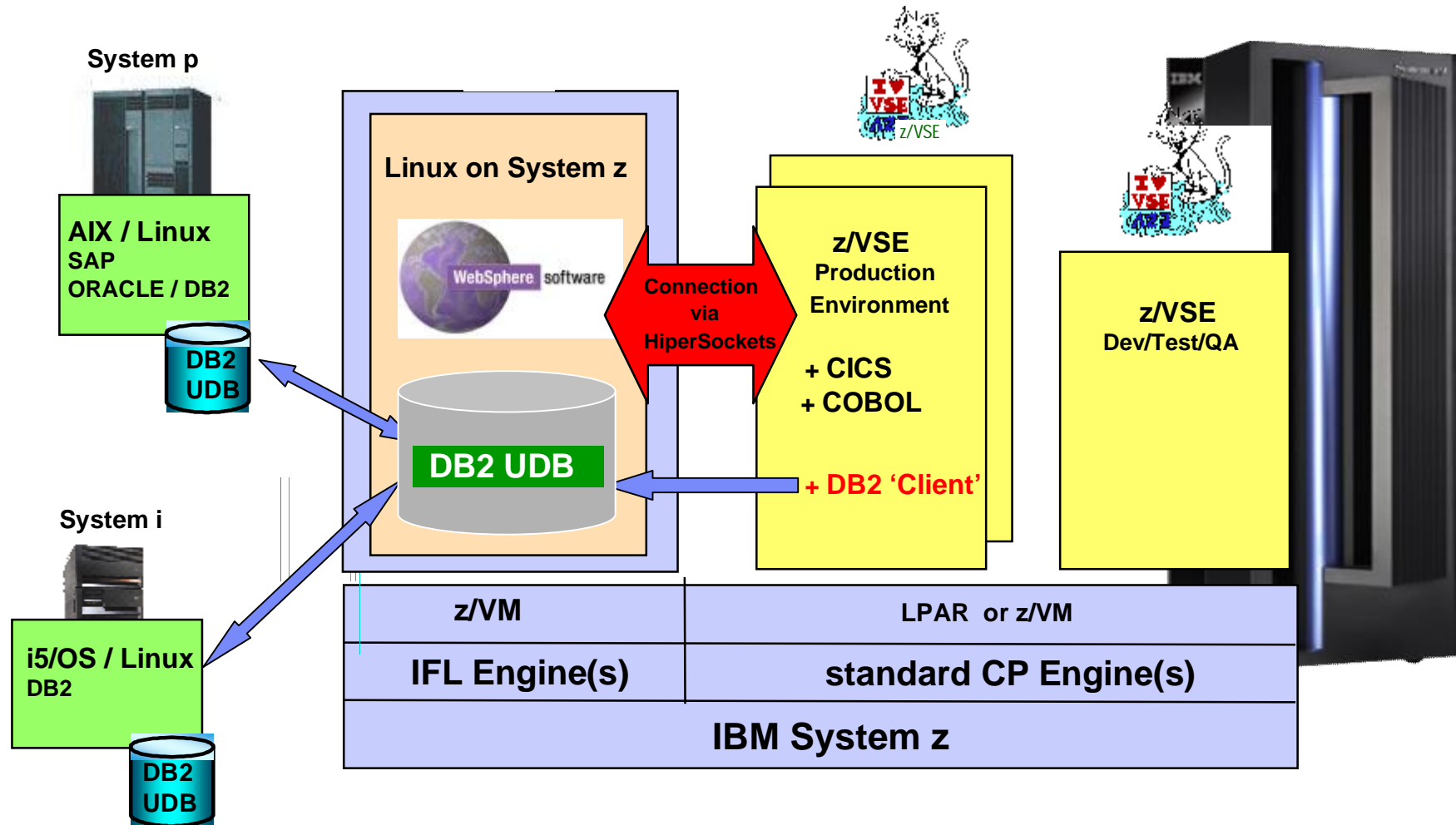
- § rules-based transformation engine, application integration hat...
- § converts green screens to graphical user interfaces
- § improves ease-of-use of host applications.



Benefit: Easily extend existing applications to the web

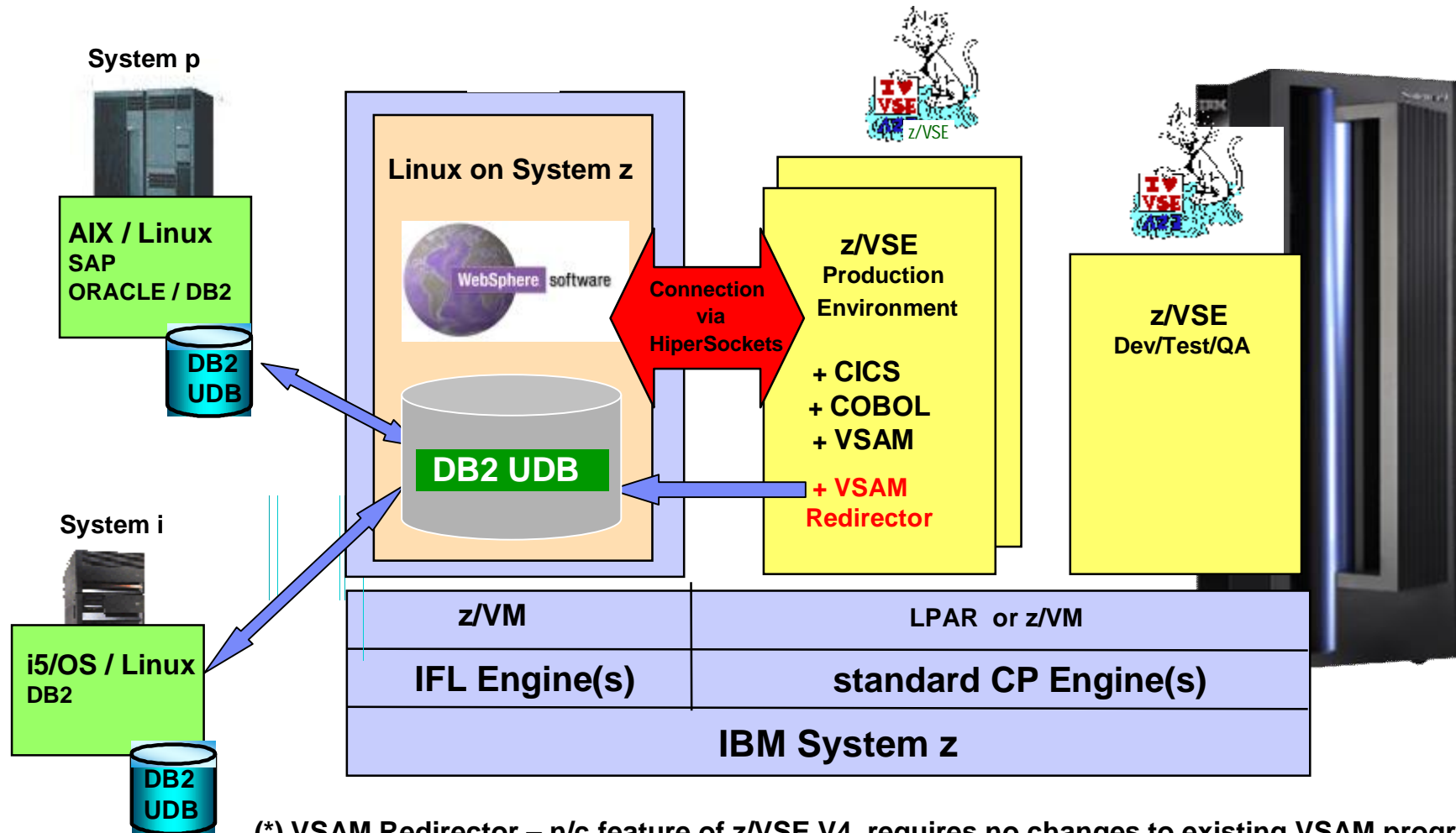
Scenario 2a: Common data Store

Leverage VSE/DB2 data with DB2 UDB on Linux on System z



Scenario 2b: Common data Store

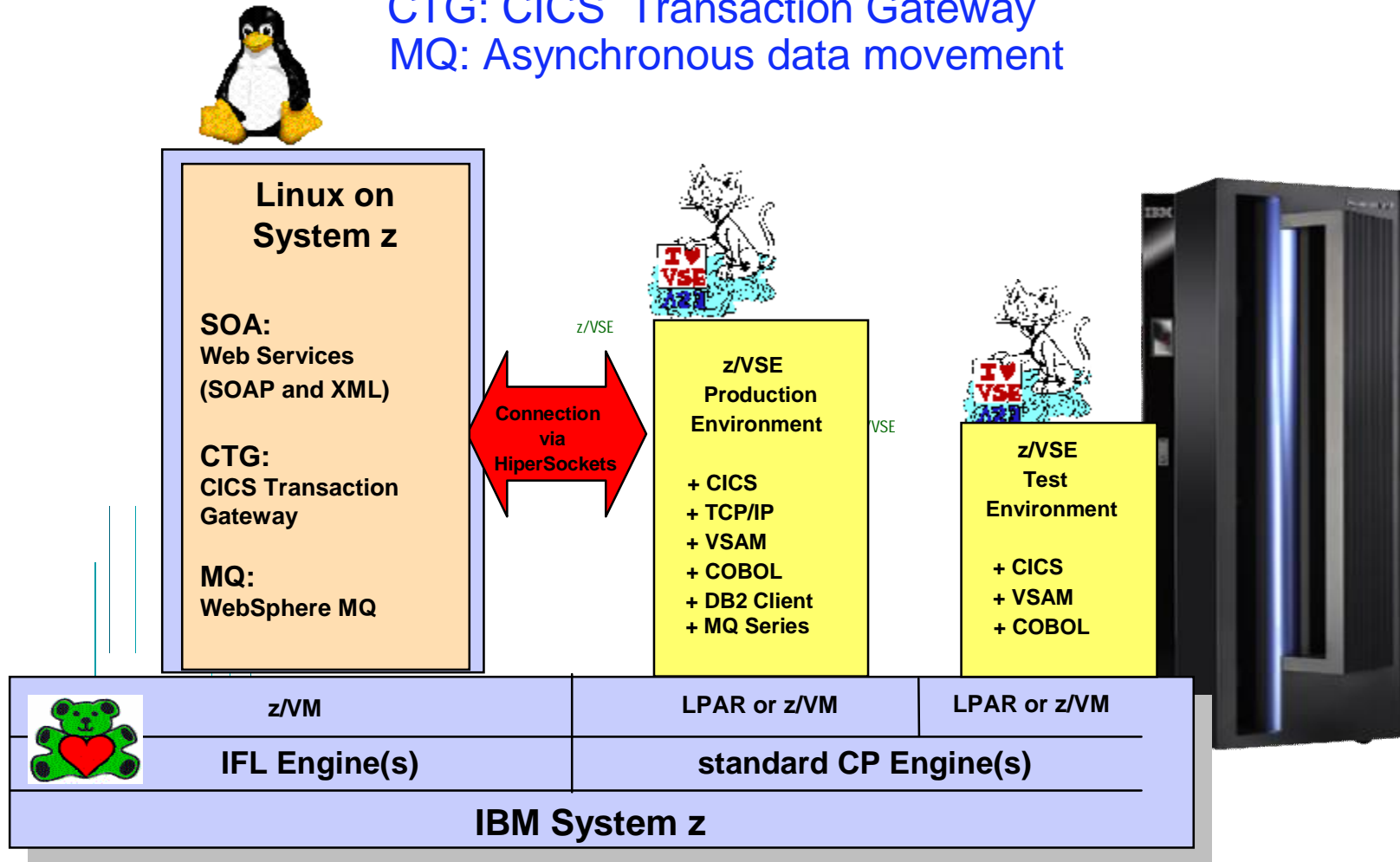
Transparent VSE/VSAM Access to DB2 UDB on Linux on System z



(*): VSAM Redirector – n/c feature of z/VSE V4, requires no changes to existing VSAM programs

Scenario 3: Integrate Applications

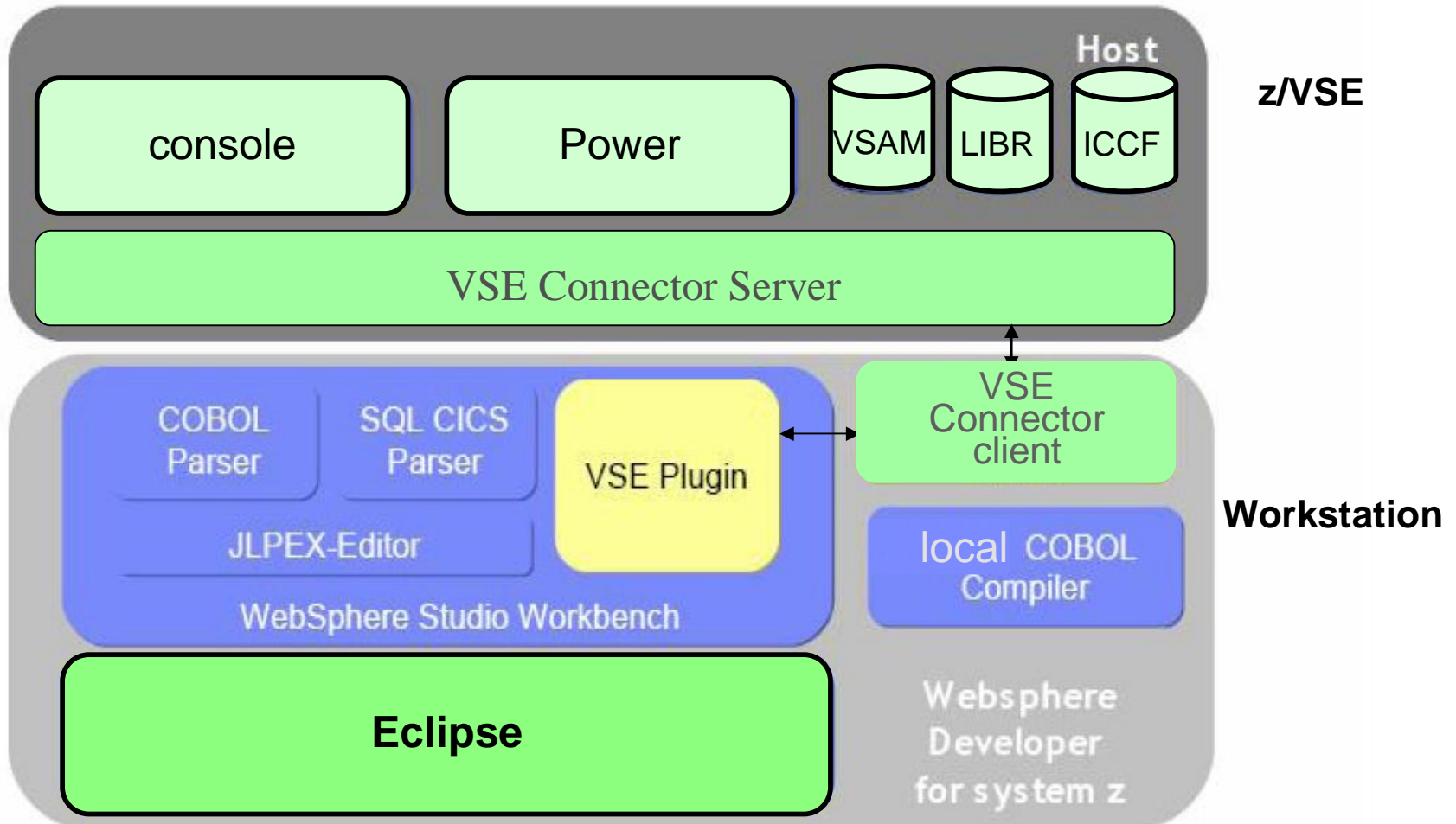
Reuse existing, proven, highly evolved VSE application logic:
 SOA: Service Oriented Architecture
 CTG: CICS Transaction Gateway
 MQ: Asynchronous data movement



Scenario 4: Appl Dev for z/VSE and the Enterprise

Eclipse and Rational Developer (formerly Websphere Developer) for System z

z/VSE Plug-in for WDz (Overview)



IBM Rational Developer from z/VSE Perspective

The screenshot shows the IBM Rational Developer from z/VSE Perspective interface. The main editor window displays COBOL code for a program named PRINTAPP. The code is organized into sections: Identification Division, Data Division (with Working-Storage Section and Linkage Section), and Procedure Division. Annotations highlight various components: '1.Perspective' points to the top menu bar; '2.View' points to the VSE System View tree on the right; '3.Projects' points to the z/OS Projects tree on the left; '4.Editor' points to the main code editor; '5.Outline View' points to the Outline view at the bottom left; and '6.VSE Console' points to the VSE Console window at the bottom.

1.Perspective

2.View

3.Projects

4.Editor

5.Outline View

6.VSE Console

The VSE Console window displays the following table:

MAP	SPACE	ARGA	V-SIZE	GET715	V-ADDR	UNUSED	NAME
AR 0015	SPACE	ARGA	716K			0	\$\$\$SUPI
AR 0015	SUP		1888K	1748K	B3000	768K	
AR 0015	SVA-24		1200K	4864K	500000	45056K	
AR 0015	BQ V		1024K	4086K	500000		
AR 0015	F1 V		2048K	4712K	500000		OK POMSTART
AR 0015	F2 V		600K	14760K	500000		OK CIGSICCF
AR 0015	F3 V		2048K	18432K	500000		OK VTANSTRK
AR 0015	F4 V		768K	256K	500000		OK
AR 0015	F5 V		256K	256K	500000		OK
AR 0015	F6 V		1024K	38456K	500000		OK TCFIP00
AR 0015	F7 V		2048K	4312K	500000		OK
AR 0015	F8 V		256K	256K	500000		OK
AR 0015	F9 V		256K	256K	500000		OK
AR 0015	FA V		256K	256K	500000		OK
AR 0015	FB V		256K	256K	500000		OK
AR 0015	FC V		256K	256K	500000		OK
AR 0015	SVA-31		7588K	6748K	2700000		OK



MWLC Pricing

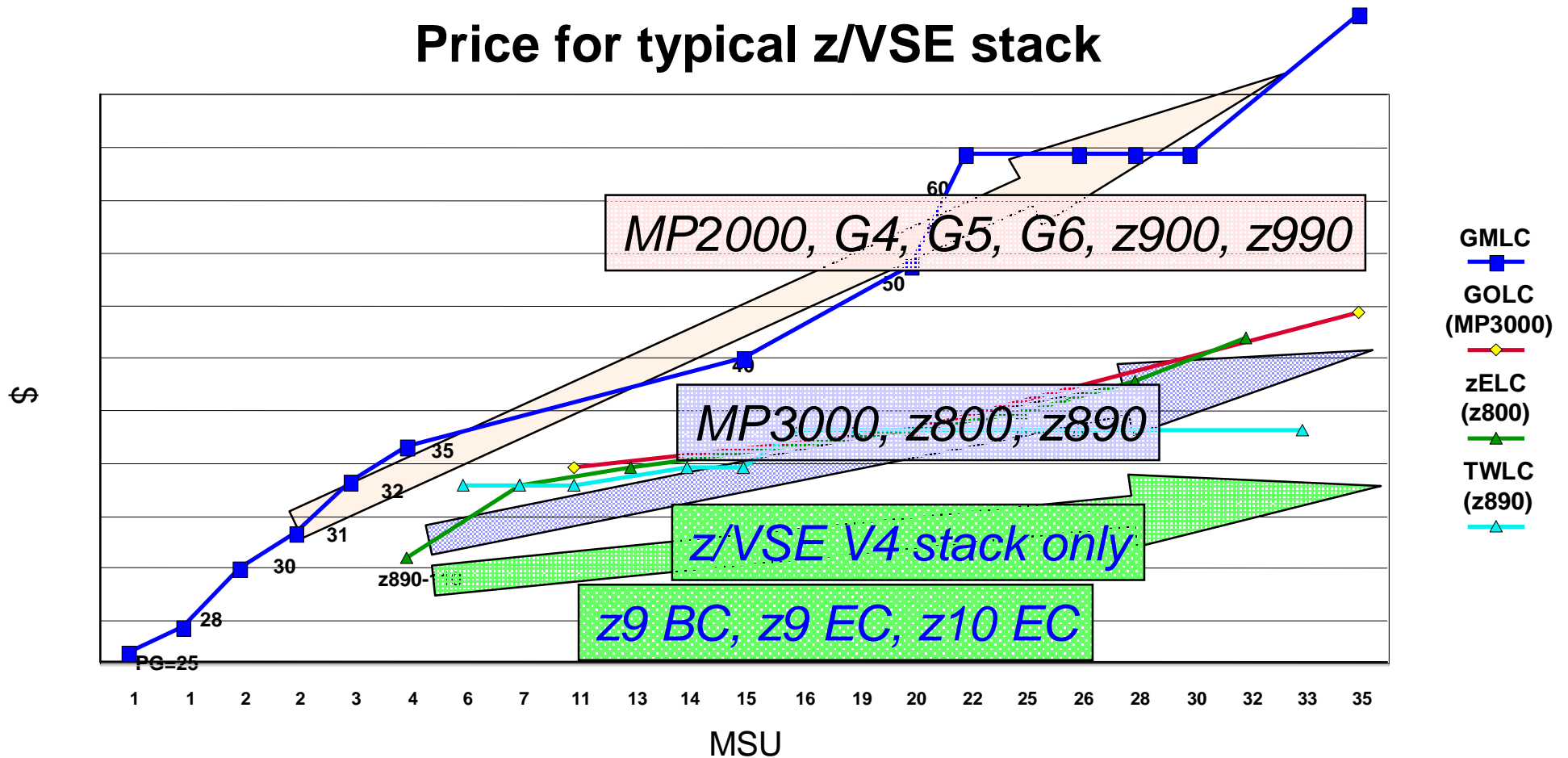
Summary of z/VSE Price Metrics

IBM Servers	z/VSE V4.2	z/VSE V4.1	z/VSE V3.1 (Note 1)
IBM System z10 Enterprise Class – z10 EC	MWLC (may be flat WLC)	MWLC (may be flat WLC)	GMLC, ELC, flat WLC
IBM System z9 Enterprise Class – z9 EC	MWLC (may be flat WLC)	MWLC (may be flat WLC)	GMLC, ELC, flat WLC
IBM System z9 Business Class – z9 BC	MWLC (A01 is zELC)	MWLC (A01 is zELC)	TWLC (A01 is zELC)
IBM eServer zSeries 990 and 900	GMLC, ELC, flat WLC	GMLC, ELC, flat WLC	GMLC, ELC, flat WLC
IBM eServer zSeries 890	TWLC (110 is zELC)	TWLC (110 is zELC)	TWLC (110 is zELC)
IBM eServer zSeries 800	zELC	zELC	zELC
S/390® Parallel Enterprise Server™ G5/G6	not applicable	not applicable	GMLC, ELC, flat WLC
S/390® Multiprise® 3000	not applicable	not applicable	GOLC

Note 1: z/VSE V3 can operate in 31-bit mode only. It does not implement z/Architecture and specifically does not implement 64-bit mode capabilities. z/VSE V3 is designed to support selected features of IBM System z hardware.

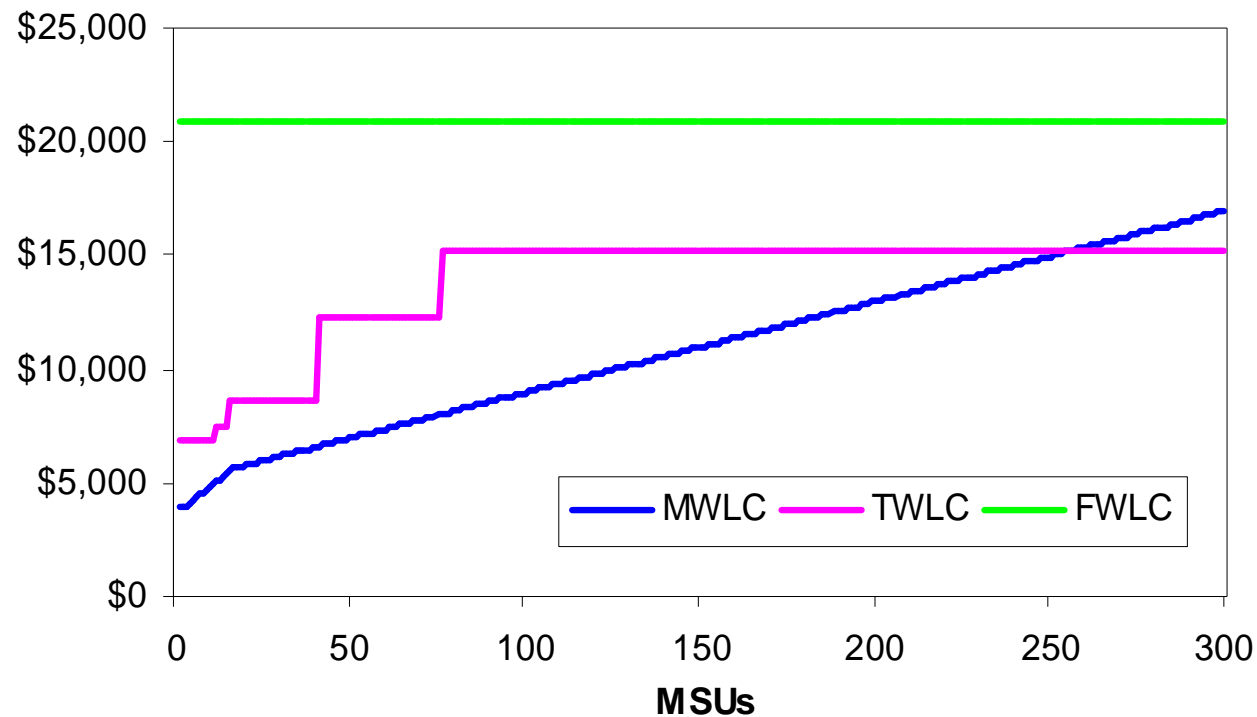
What does MWLC do to Price/Performance ?

Price for typical z/VSE stack



Typical z/VSE stack consists of VSE/CF, CICS TS, VTAM, TCP/IP, DB2

MWLC Sample Stack vs. TWLC and FWLC

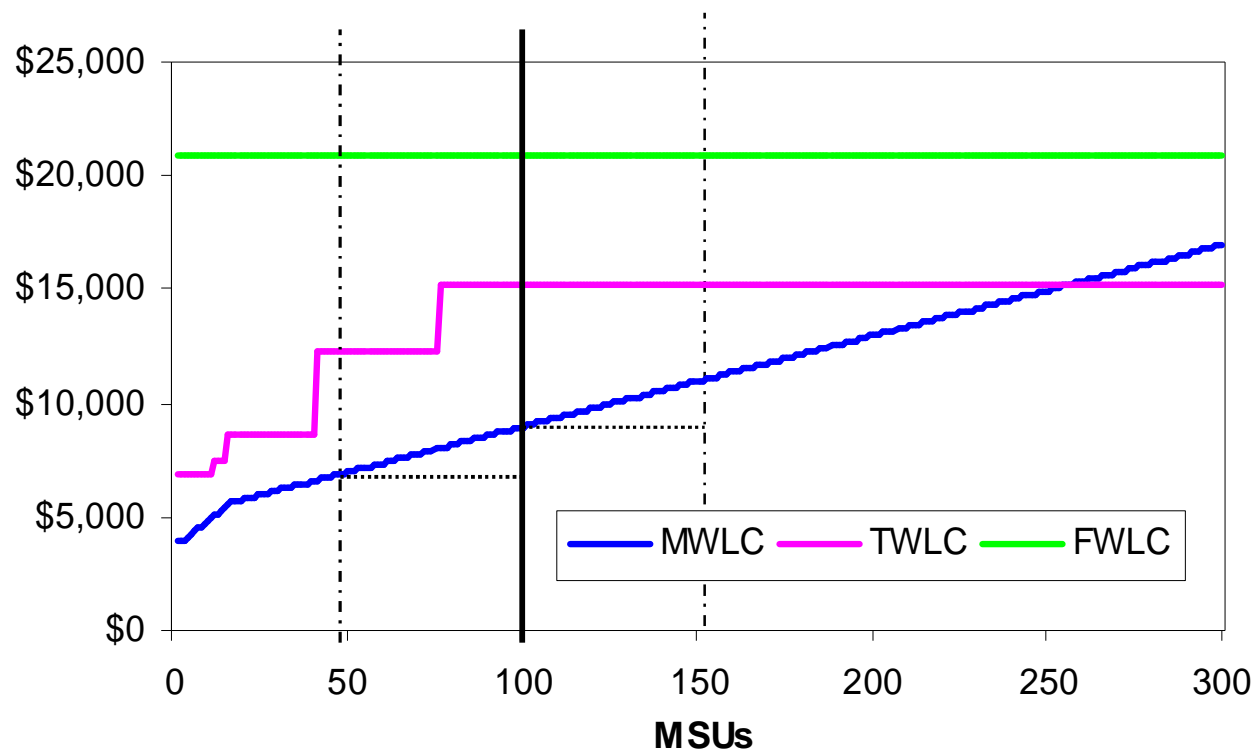


- § Customers may choose between MWLC/TWLC or MWLC/FWLC as appropriate to their machine
- § Additional price/performance may be possible with sub-capacity mode

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

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

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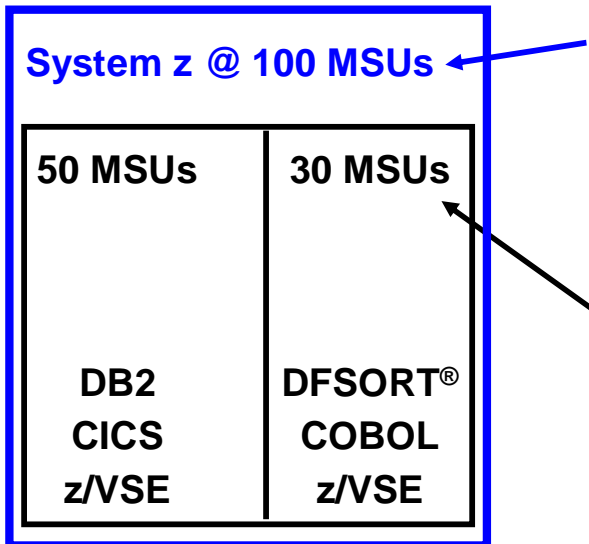
*Prices subject to change without notice; all prices shown in USD

VSE-related Products eligible for MWLC

1. z/VSE V4 (VSE Central Functions V8)
 - § EF for z/VSE V1.1
2. CICS TS for VSE/ESA
3. ACF/VTAM® V4 VSE/ESA
4. TCP/IP for VSE/ESA
5. DB2 Server for VSE & VM
6. DL/I DOS/VS
7. IBM Cobol VSE/ESA
8. IBM PL/1 for VSE/ESA
9. IBM C for VSE/ESA
10. HLASM
11. WebSphere MQSERIES® for VSE/ESA
12. DITTO/ESA® for VSE
13. IBM DFSORT /VSE® V3

Product ID	Product Name
5686CF8	z/VSE V4.1
5648054	CICS TS for VSE/ESA
5648099	DITTO/ESA® FOR VSE
5686A04	TCP/IP NFS
5686A04	TCP/IP Application Pak
5686A04	TCP/IP GPS
5686065	ACF/VTAM® V4 VSE Clnt/Serv
5686065	ACF/VTAM V4 VSE Inter Ent
5686065	ACF/VTAM V4 VSE MultiDomain
5686068	IBM COBOL VSE/ESA Full Func
5686068	IBM COBOL VSE/ESA Alt Func
5696234	High Lvl Assem. VSE Only
5697F42	DB2 Server for VSE&VM
5697F42	DB2 QMF for VM/VSE
5697F42	DB2 QMF for Windows feat of DB2
5697F42	DB2 QMF for Windows feat of QMF
5697F42	DB2 Control Center for VM/VSE
5746SM3	IBM DFSORT/VSE® V3
5686A06	MQSERIES® VSE/ESA
5746XX1	DL/I Data Language
5686A01	C/VSE Alt. Function
5686A01	C/VSE Full Function
5686069	IBM PL/I VSE/ESA Full Func
5686069	IBM PL/I VSE/ESA Alt Func

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 an eligible product executes.

Sub-Capacity Concept: Rolling 4-Hour Average

Capture the 4-hour rolling average of utilization for each interval in the month

4-Hour Rolling Average

11 am (8,9,10,11): 35 MSUs

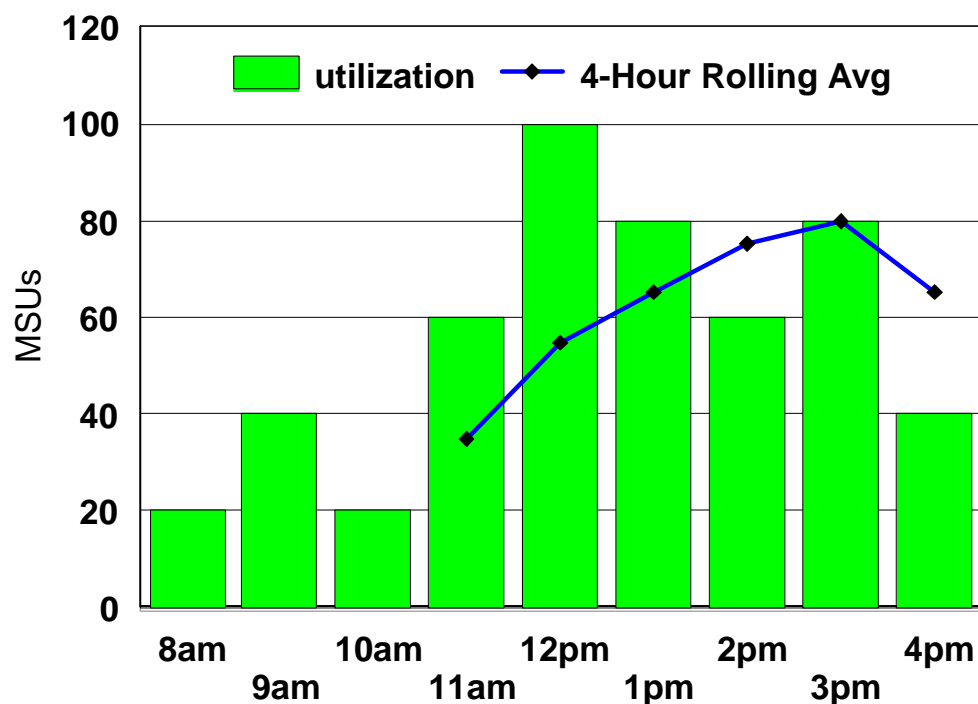
12 pm (9,10,11,12): 55 MSUs

1 pm (10,11,12,1): 65 MSUs

2 pm (11,12,1,2): 75 MSUs

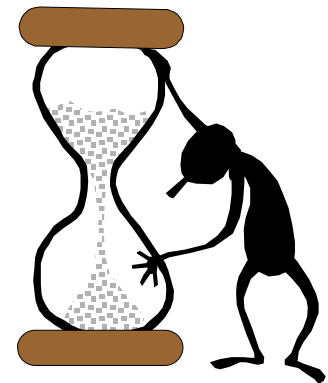
3 pm (12, 1, 2, 3): 80 MSUs

4 pm (1, 2, 3, 4): 65 MSUs



Capacity Measurement Tool (CMT)

- § Sometimes called “Sub-Capacity Monitoring Tool”
- § Announced and available with z/VSE V4.1 since March 16, 2007
- § Can be activated on z10 EC, z9 EC & z9 BC models only
- § Requires z/Architecture mode è z/VSE V4 only
- § Collects data for LPARs and/or guest machines running under z/VM 5.2 (or later)
- § Implemented as a new z/VSE V4 system task
 - periodically measures CPU usage and calculates MSUs
 - measurement interval is every 30 minutes
 - calculates the rolling 4-hour average
 - creates dataset with SCRT89 records
- § Output from CMT is input for **SCRT**



Sub-Capacity Reporting Tool (SCRT)

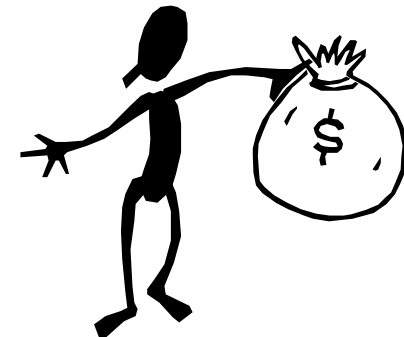
§ SCRT V14.2 Available on z/VSE V4.1 since October 2007

- For a time, sub-capacity customers were required to submit measurement data to Boeblingen lab for processing

§ Analyzes SCRT89 records as produced by CMT on z/VSE V4

§ Also analyzes SMF70 and SMF89 records as produced by z/OS

§ Output from SCRT is a report, similar to a **spreadsheet report**



Transition to z/VSE V4 Sub-Capacity Pricing

§ Basic Requirements

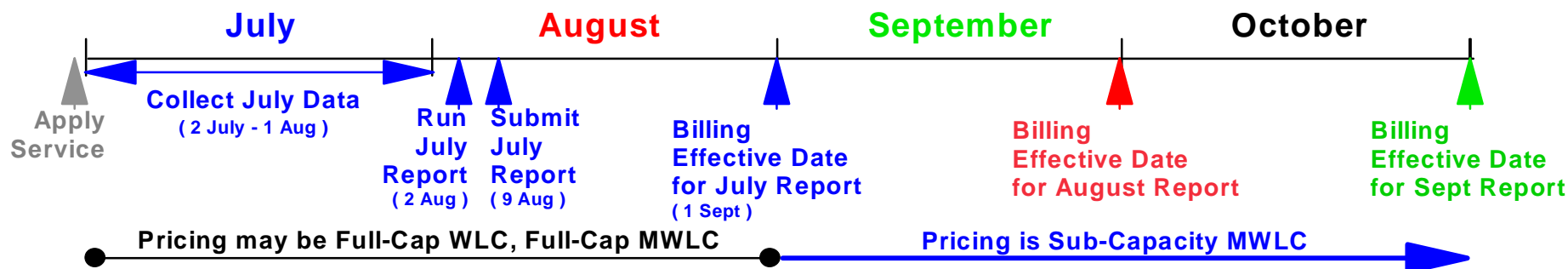
- IBM System z10, z9 EC, or z9 BC (exception: z9 BC A01 is priced zELC and cannot get sub-cap pricing)
- z/VSE V4 (no older VSE version allowed on same processor, i.e. no VSE/ESA V2, no z/VSE V3)
- If running under VM: z/VM 5.2 (or later) is required

§ Reporting Requirements

- Must report on all LPARs and z/VM guests (production, test, development, etc.)
- 95% data collection
- Default (i.e. worst case) is full-capacity prices
- 2-month full-capacity transition period

§ Timing Requirements

- Sub-Capacity Pricing begins with the submission of 1st full month report
- Data collection period: 2nd of the previous month - 1st of the current month
- Data submission period: 2nd - 9th following data collection



Multiprise 3000 Scenario



Stack Price	100 (Index)
CP MIPS	56 MIPS
IFL MIPS	109 MIPS
IFLs Avail	up to 1

Stack Price	67 (-33%)
CP MIPS	59 MIPS
IFL MIPS	480 MIPS
IFLs Avail	up to 6

Stack Price	100
CP MIPS	340 MIPS (6.07X)
IFL MIPS	480 MIPS
IFLs Avail	up to 6



z800 Scenario



Stack Price	100
CP MIPS	143 MIPS
IFL MIPS	192 MIPS
IFLs Avail	up to 3

Stack Price	69 (-31%)
CP MIPS	150 MIPS
IFL MIPS	480 MIPS
IFLs Avail	up to 6

Stack Price	91 (-9%)
CP MIPS	480 MIPS (3.36X)
IFL MIPS	480 MIPS
IFLs Avail	up to 6



z890 Scenario



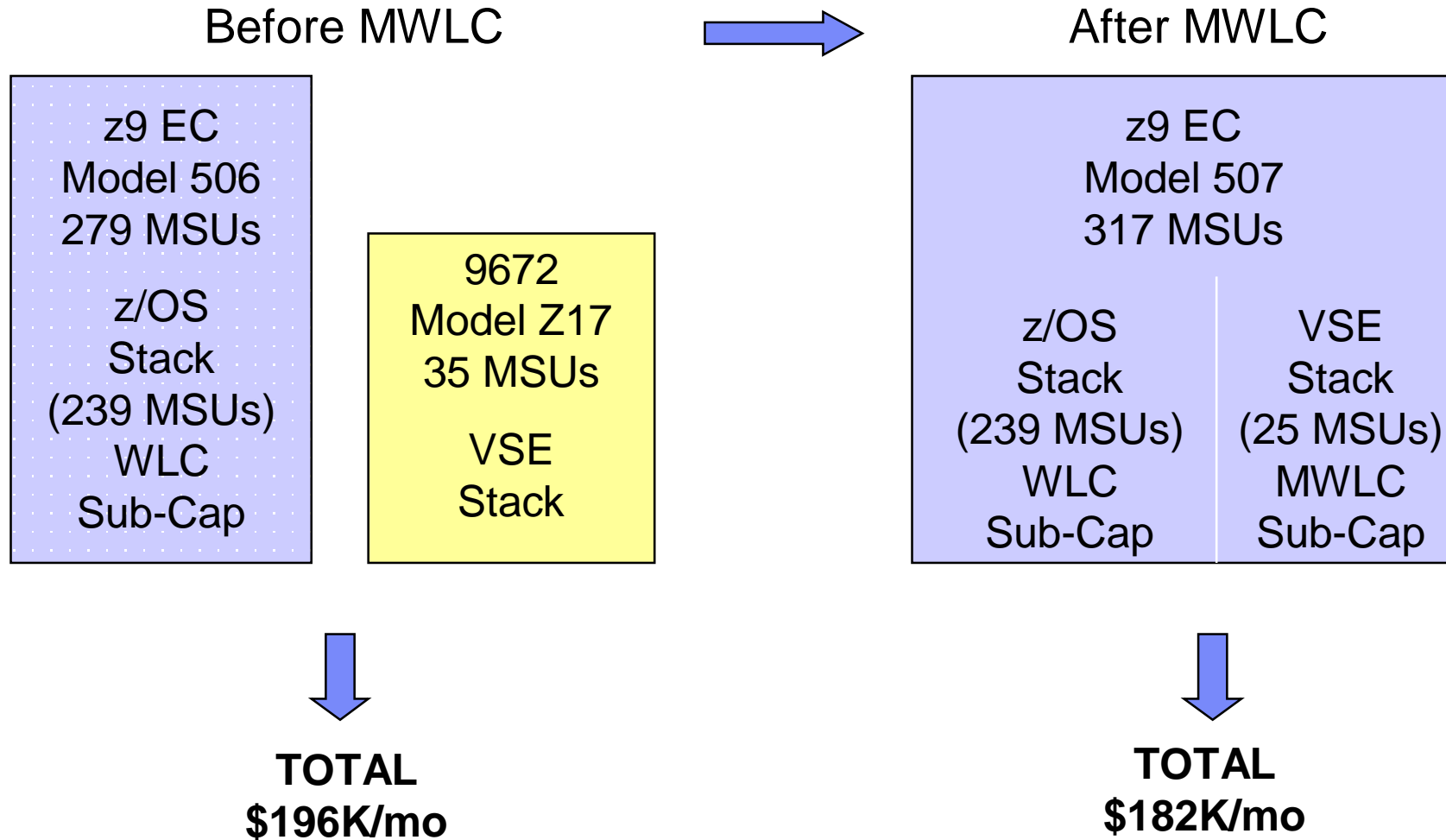
Stack Price	100
CP MIPS	212 MIPS
IFL MIPS	365 MIPS
IFLs Avail	up to 3

Stack Price	76 (-24%)
CP MIPS	216 MIPS
IFL MIPS	480 MIPS
IFLs Avail	up to 6

Stack Price	95 (-5%)
CP MIPS	480 MIPS (2.26X)
IFL MIPS	480 MIPS
IFLs Avail	up to 6



z/VSE V4: MWLC High-End Price/Performance server consolidation example





Summary: z/VSE V4 and MWLC

- § **Helping to protect your investments in core z/VSE application code, data, application knowledge, and IT skills**
- § **Helping to preserve your highly evolved business processes and end-user training**
- § **Helping you to implement new solutions in a three-tier, integrated environment that leverages existing z/VSE information assets**
- § **Helping improve price / performance**
- § **The resulting savings can – and should – be used to invest in new solutions, e.g.**
 - SOA
 - Linux on System z
 - new middleware
 - new standard software
 - new application development
 - new projects with IBM





Summary/Wrap-up

Additional Information

§ z/VSE Live Virtual Classes

- § z/VSE and MWLC Announcement Overview
- § Midrange Workload Licence Charges (MWLC)
- § z/VSE V4.1 Solutions based on SOA and DB2
- § z/VSE Security
- § z/VSE V4.1 User Experience
- § IBM System z Hardware
- § New VSAM Tools
- § Bringing You up to Date with z/VSE V4
- § z/VSE Wellness
- § Using Encryption Technology with z/VSE
- § DB2 Server for VSE & VM V7.5
- § *Modern Application Dev for z/VSE*
- § *z/VSE Application Development Demo*
- § *z/VSE Tools – An Overview*
- § *z/VSE Midyear Update – z/VSE V4.2*
- § *..... more planned – watch z/VSE web site*

Note: Charts are available on the z/VSE web site the day prior to the call. Replay usually available the day after the call. For more information, please see the z/VSE web site at:

<http://www-03.ibm.com/servers/eserver/zseries/zvse/>

§ z/VSE-related Events

- § **2008 US IBM System z Expo - featuring z/OS, z/VM, z/VSE, and Linux on System z**
 - Las Vegas, NV
 - October 13 – 17

IBM System z Expo
featuring z/OS, z/VM,
z/VSE, Linux on
System z
October 13-17, 2008
Las Vegas, NV



Learn more

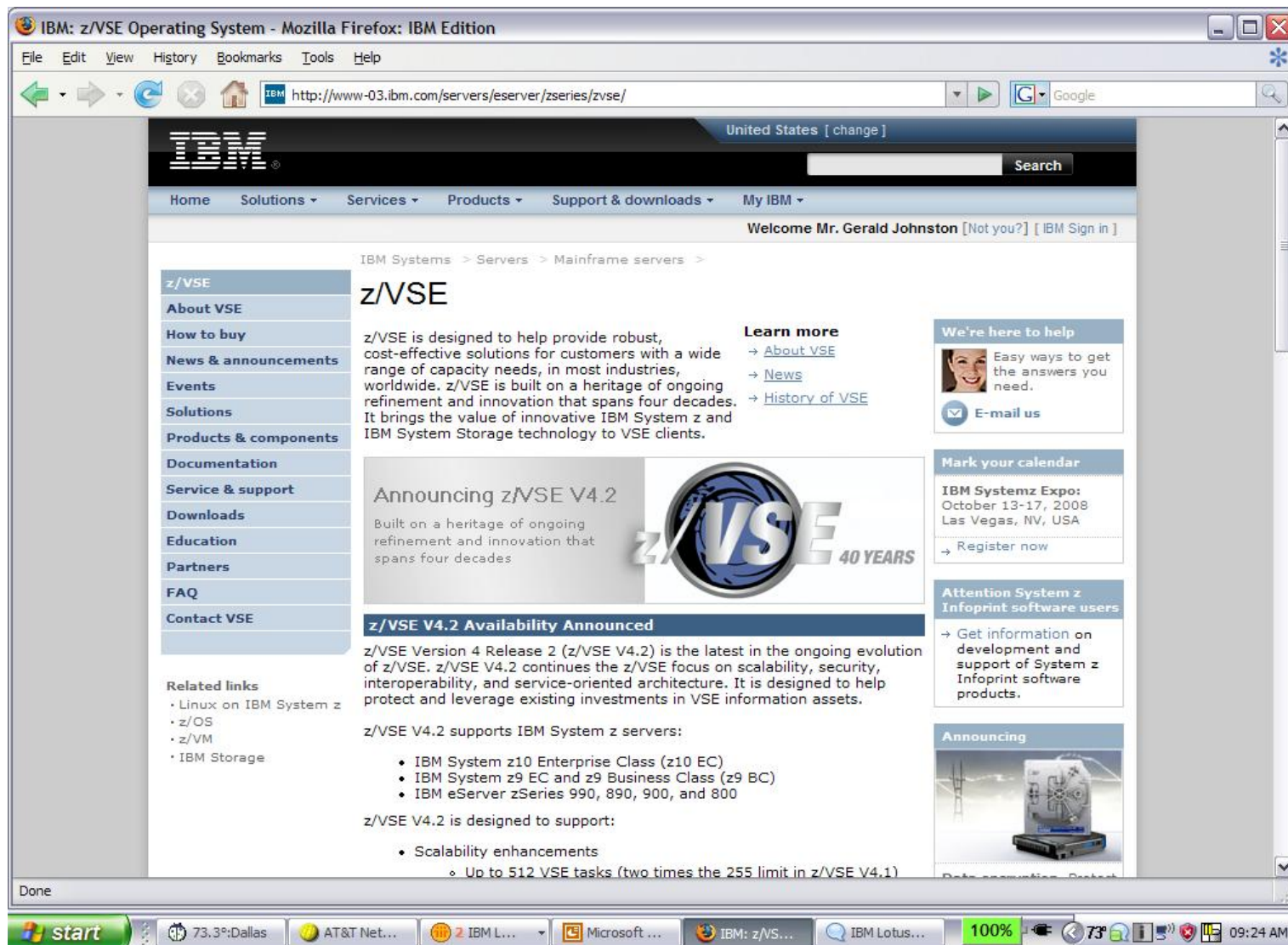
- § **2008 European IBM/GSE Conf - featuring z/VSE, z/VM, and Linux on System z**
 - Leipzig, Germany
 - October 27 - 29



- § **2009 WAVV Conference - featuring z/VSE, z/VM, and Linux on System z**
 - Orlando, FL
 - May 15 – 19, 2009



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



The screenshot shows a Mozilla Firefox browser window displaying the IBM z/VSE website. The browser title is "IBM: z/VSE Operating System - Mozilla Firefox: IBM Edition". The address bar shows the URL "http://www-03.ibm.com/servers/eserver/zseries/zvse/". The website features the IBM logo at the top left, a search bar, and a navigation menu with options like Home, Solutions, Services, Products, Support & downloads, and My IBM. A personalized greeting "Welcome Mr. Gerald Johnston" is visible. The main content area is titled "z/VSE" and includes a sidebar with a table of contents (About VSE, How to buy, News & announcements, Events, Solutions, Products & components, Documentation, Service & support, Downloads, Education, Partners, FAQ, Contact VSE). The main text describes z/VSE as a robust, cost-effective solution built on a heritage of innovation. A prominent banner announces "z/VSE V4.2 Availability Announced" with a "40 YEARS" logo. Below this, it states that z/VSE V4.2 supports IBM System z servers, listing models like z10 Enterprise Class, z9 EC, z9 Business Class, and eServer zSeries 990, 890, 900, and 800. It also mentions scalability enhancements, such as supporting up to 512 VSE tasks. The right sidebar contains sections for "We're here to help" (with an "E-mail us" button), "Mark your calendar" (for the IBM Systemz Expo on October 13-17, 2008 in Las Vegas, NV, USA), and "Attention System z Infoprint software users". The Windows taskbar at the bottom shows the Start button, system tray with temperature (73.3°F), network status, and the time (09:24 AM).

Thanks for listening



Your friends, the VSE development team

