

2012

IBM System z Technical University

Enabling the infrastructure for smarter computing

z/VSE on zEnterprise Features, Functions, Software Pricing

zDG02

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Agenda

- § **IBM zEnterprise**
 - z196, z114, zEC12
 - zBX
 - zManager

- § **z/VSE Strategy and how it relates to zEnterprise**
 - Hybrid
 - PIE

- § **z/VSE Exploitation of zEnterprise**
 - z/VSE V5.1
 - z/VSE V4.3

- § **Pricing Strategy on z114**
 - Hardware Pricing
 - Software Pricing

- § **Wrap-up**



IBM zEnterprise System - Best in Class Systems and Software Technologies:

A system of systems that unifies IT for predictable service delivery



Unified management for a smarter system: **zEnterprise Unified Resource Manager**

- § Part of the IBM System Director family, provides platform, hardware and workload management
- § Unifies management of resources, extending IBM System z[®] qualities of service across the infrastructure

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




- § 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



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

- § Selected IBM POWER7™ blades and IBM System x[®] Blades for tens of thousands of AIX[®], Linux, and Windows applications
- § High performance optimizers and appliances to accelerate time to insight and reduce cost
- § Dedicated high performance private network

IBM zEnterprise Family

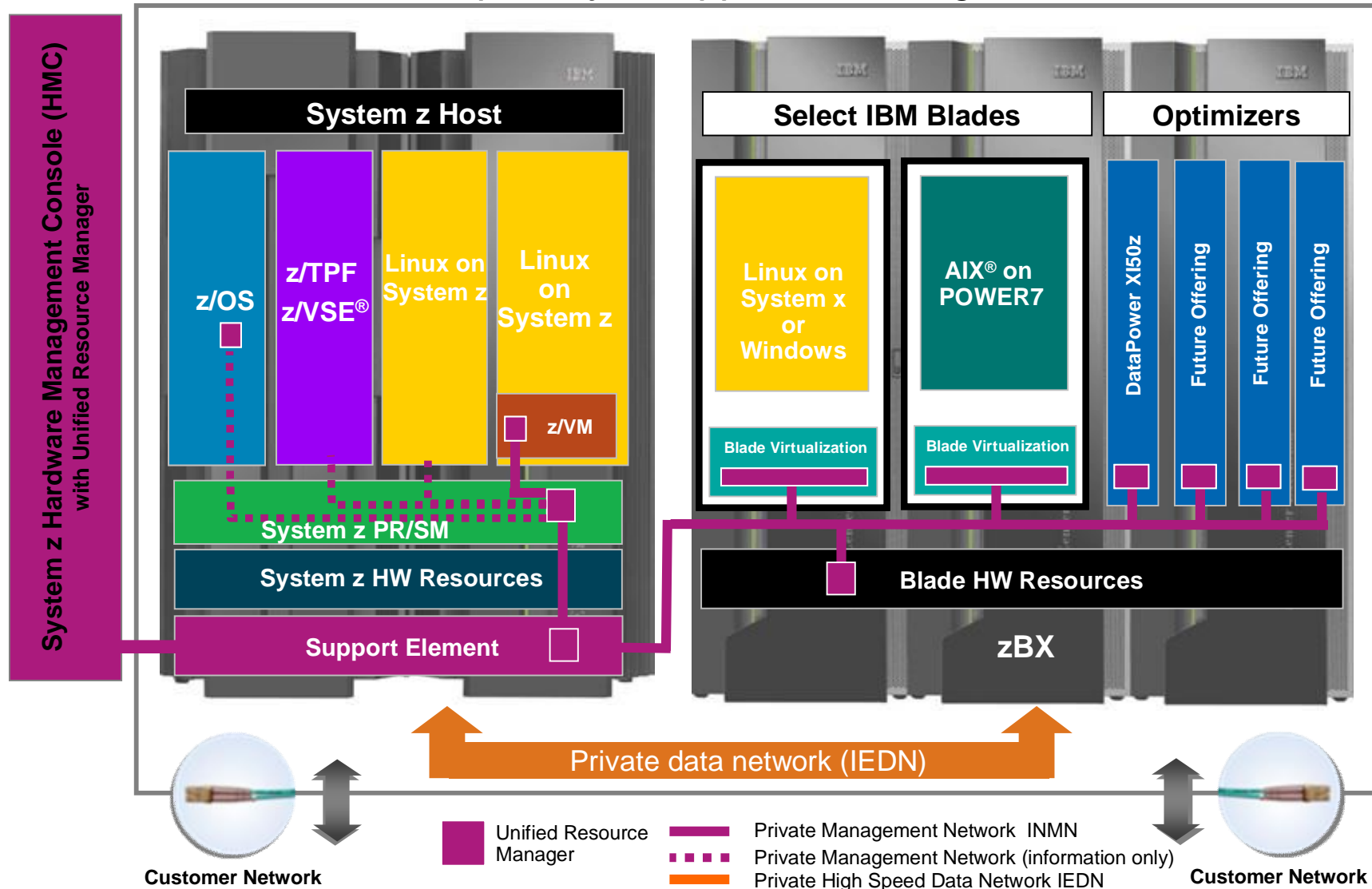
<p>IBM zEnterprise 196 (2817)</p> 	<p>IBM zEnterprise Blade Extension (2458)</p> 	<p>IBM zEnterprise 114 (2818)</p> 
<ul style="list-style-type: none"> § Announced 7/10 – Server w/ up to 96 PU cores § 5 models – Up to 80-way § Granular Offerings for up to 15 CPUs § PU (Engine) Characterization <ul style="list-style-type: none"> – CP, SAP, IFL, ICF, zAAP, zIIP § On Demand Capabilities <ul style="list-style-type: none"> – CoD, CIU, CBU, On/Off CoD, CPE § Memory – up to 3 TB for Server and up to 1 TB per LPAR <ul style="list-style-type: none"> – 16 GB Fixed HSA § Channels <ul style="list-style-type: none"> – PCIe bus – Four LCSSs – 3 Subchannel Sets – MIDAW facility – Up to 240 ESCON channels – Up to 288 FICON channels – FICON Express8 and 8S – zHPF – OSA 10 GbE, GbE, 1000BASE-T – InfiniBand Coupling Links § Configurable Crypto Express3 § Parallel Sysplex clustering § HiperSockets – up to 32 § Up to 60 logical partitions § Enhanced Availability § Unified Resource Manager § Operating Systems <ul style="list-style-type: none"> – z/OS, z/VM, z/VSE, z/TPF, Linux on System z 	<ul style="list-style-type: none"> § Announced 07/10 § Model 002 for z196 or z114 § zBX Racks with: <ul style="list-style-type: none"> – BladeCenter Chassis – N + 1 components – Blades – Top of Rack Switches – 8 Gb FC Switches – Power Units – Advance Management Modules § Up to 112 Blades <ul style="list-style-type: none"> – IBM Smart Analytics Optimizer Solution – POWER7 Blades – IBM System x Blades – IBM WebSphere DataPower Integration Appliance X150 for zEnterprise (M/T 2462-4BX) – Operating Systems <ul style="list-style-type: none"> – AIX 5.3 and higher – Linux for Select IBM x Blades – Microsoft Windows for x Blades – Hypervisors <ul style="list-style-type: none"> – PowerVM Enterprise Edition – Integrated Hypervisor for System x 	<ul style="list-style-type: none"> § Announced 07/11 § 2 models – M05 and M10 <ul style="list-style-type: none"> § Up to 5 CPUs § High levels of Granularity available <ul style="list-style-type: none"> – 130 Capacity Indicators § PU (Engine) Characterization <ul style="list-style-type: none"> – CP, SAP, IFL, ICF, zAAP, zIIP § On Demand Capabilities <ul style="list-style-type: none"> – CoD, CIU, CBU, On/Off CoD, CPE § Memory – up to 256 GB for Server <ul style="list-style-type: none"> – 8 GB Fixed HSA § Channels <ul style="list-style-type: none"> – PCIe bus – Two LCSSs – 2 Subchannel Sets – MIDAW facility – Up to 240 ESCON channels – Up to 128 FICON channels – FICON Express8 and 8S – zHPF – OSA 10 GbE, GbE, 1000BASE-T – InfiniBand Coupling Links § Configurable Crypto Express3 § Parallel Sysplex clustering § HiperSockets – up to 32 § Up to 30 logical partitions § Unified Resource Manager § Operating Systems <ul style="list-style-type: none"> – z/OS, z/VM, z/VSE, z/TPF, Linux on System z

IBM zEnterprise EC12 – new since September 2012

IBM zEnterprise EC12 (2827)	IBM zEnterprise Blade Extension (2458)
	
<ul style="list-style-type: none">• Announced 8/12 – Server w/ up to 101 PU cores• 5 models – Up to 101-way• Granular Offerings for up to 20 CPs• PU (Engine) Characterization<ul style="list-style-type: none">– CP, SAP, IFL, ICF, zAAP, zIIP• On Demand Capabilities<ul style="list-style-type: none">– CoD, CIU, CBU, On/Off CoD, CPE, FoD• Memory – up to 3 TB for Server and up to 1 TB per LPAR<ul style="list-style-type: none">– 32 GB Fixed HSA• Channels<ul style="list-style-type: none">– PCIe bus– Four LCSSs– 3 Subchannel Sets– FICON Express8 and 8S– zHPF– OSA 10 GbE, GbE, 1000BASE-T– InfiniBand Coupling Links– Flash Express• Configurable Crypto Express4S• Parallel Sysplex clustering• HiperSockets – up to 32• Up to 60 logical partitions• Enhanced Availability• IBM zAware• Unified Resource Manager• Operating Systems<ul style="list-style-type: none">– z/OS, z/VM, z/VSE, z/TPF, Linux on System z	<ul style="list-style-type: none">• First Announced 07/10• Model 003 for zEC12 – 08/12• zBX Racks with:<ul style="list-style-type: none">– BladeCenter Chassis– N + 1 components– Blades– Top of Rack Switches– 8 Gb FC Switches– Power Units– Advance Management Modules• Up to 112 Blades<ul style="list-style-type: none">– POWER7 Blades– IBM System x Blades– IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (M/T 2462-4BX)• Operating Systems<ul style="list-style-type: none">– AIX 5.3 and higher– Linux for Select IBM x Blades– Microsoft Windows for x Blades• Hypervisors<ul style="list-style-type: none">– PowerVM Enterprise Edition– Integrated Hypervisor for System x

Putting zEnterprise System to the Task

Use the smarter solution to improve your application design



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§ IBM zEnterprise

- z196, z114, zEC12
- zBX
- zManager



§ z/VSE Strategy and how it relates to zEnterprise

- Hybrid
- PIE

§ z/VSE Exploitation of zEnterprise

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

§ Pricing Strategy on z114

- Hardware Pricing
- Software Pricing

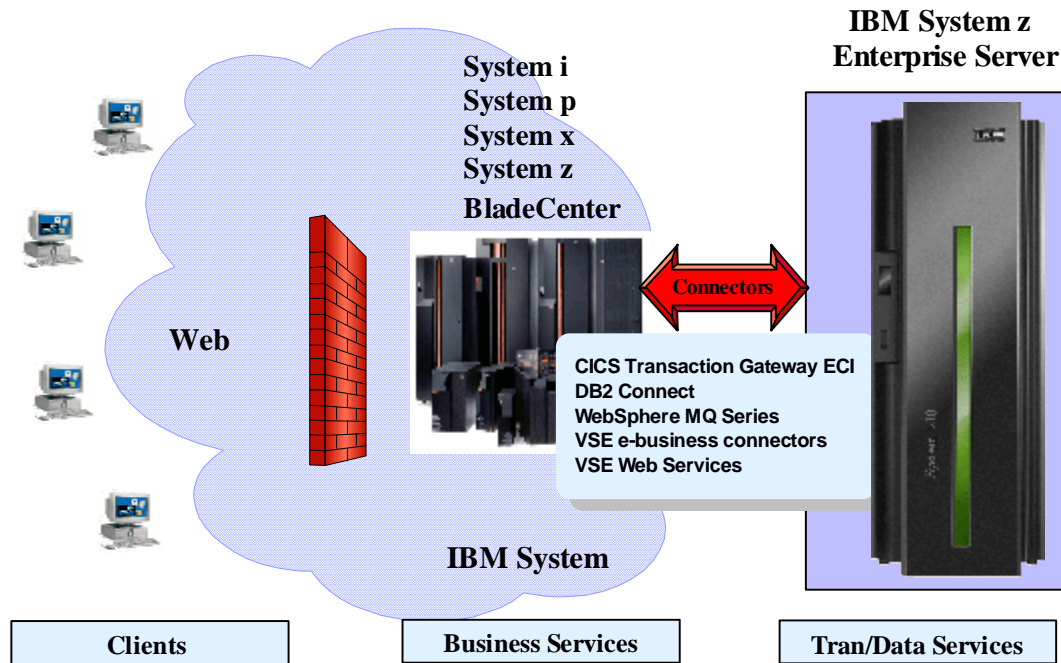
§ Wrap-up



z/VSE Strategy - Invented in Year 2000

alias

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



Protect existing VSE investments

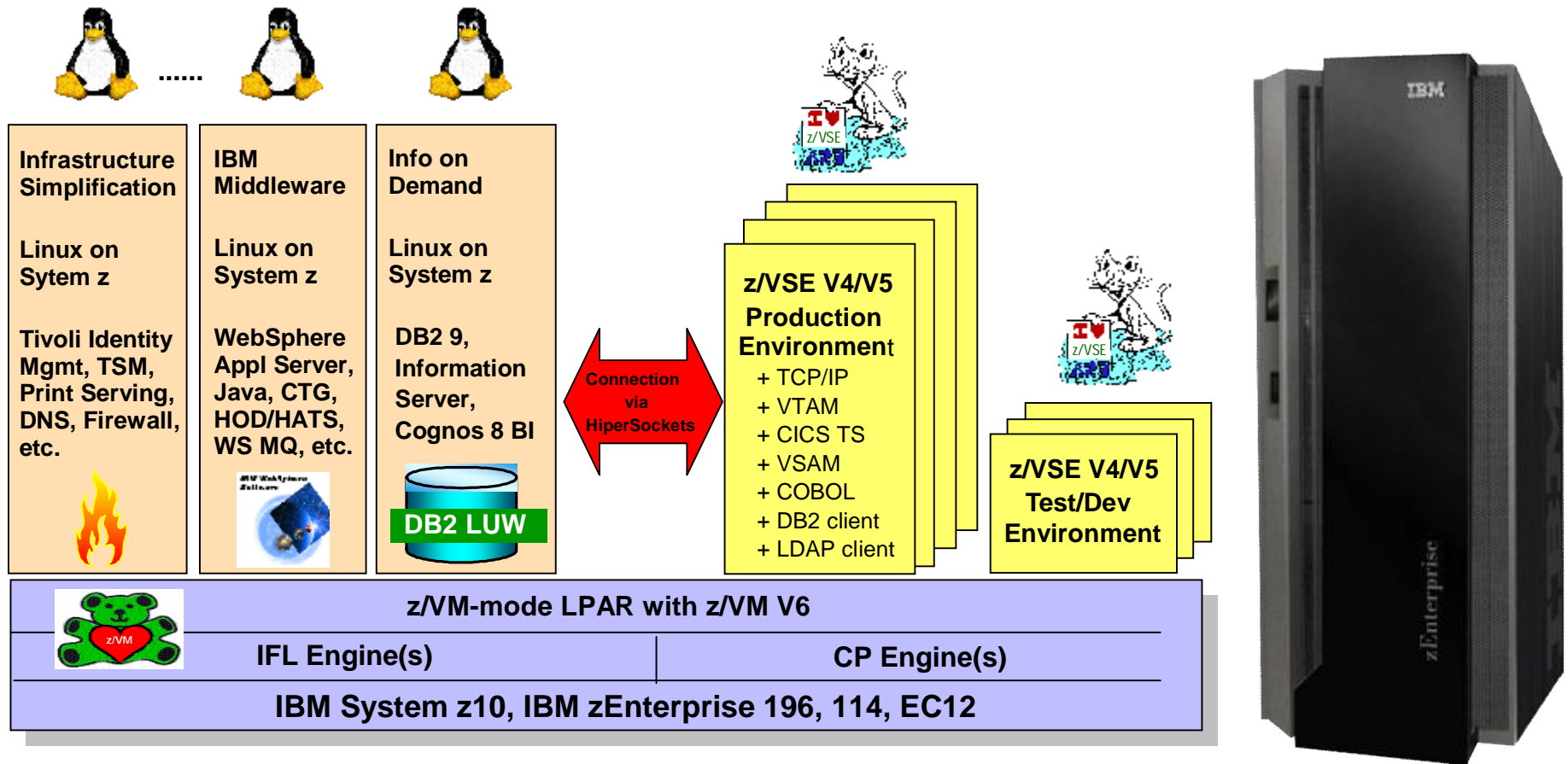
Integrate using middleware and VSE connectors

Extend with another platform to access new applications & solutions

z/VSE Strategy w/ Linux on System z

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

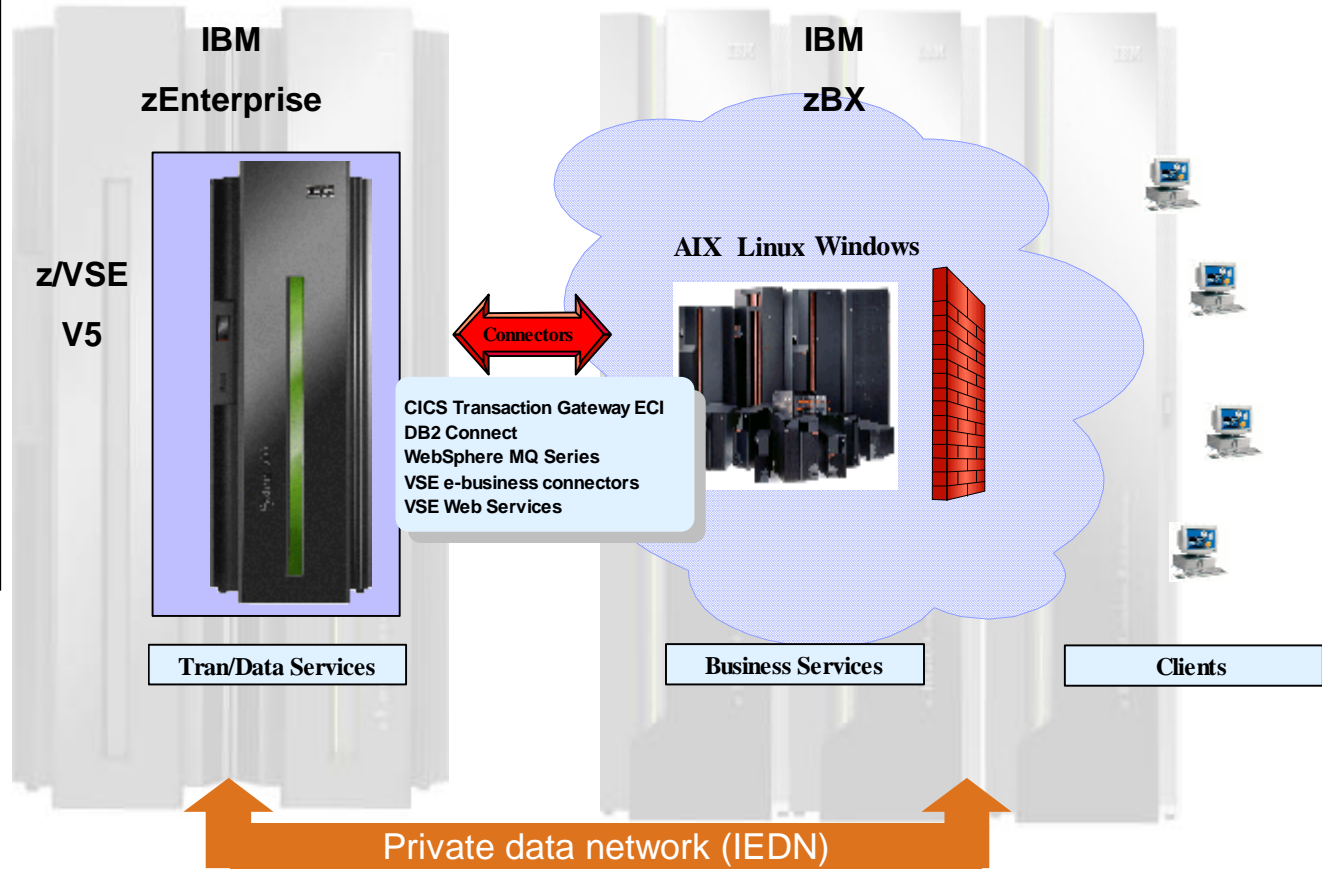
- P**rotect existing VSE investments
- I**ntegrate using middleware and VSE connectors
- E**xtend with Linux on IBM System z technology & solutions



z/VSE V5 Strategy with zEnterprise - More options, highly integrated

Natural evolution into zEnterprise

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



Protect existing z/VSE investments
Integrate using middleware and z/VSE connectors
Extend with zBX or with Linux on z to access new applications & solutions

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z/VSE Evolution



*) 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.

***) All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

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



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)

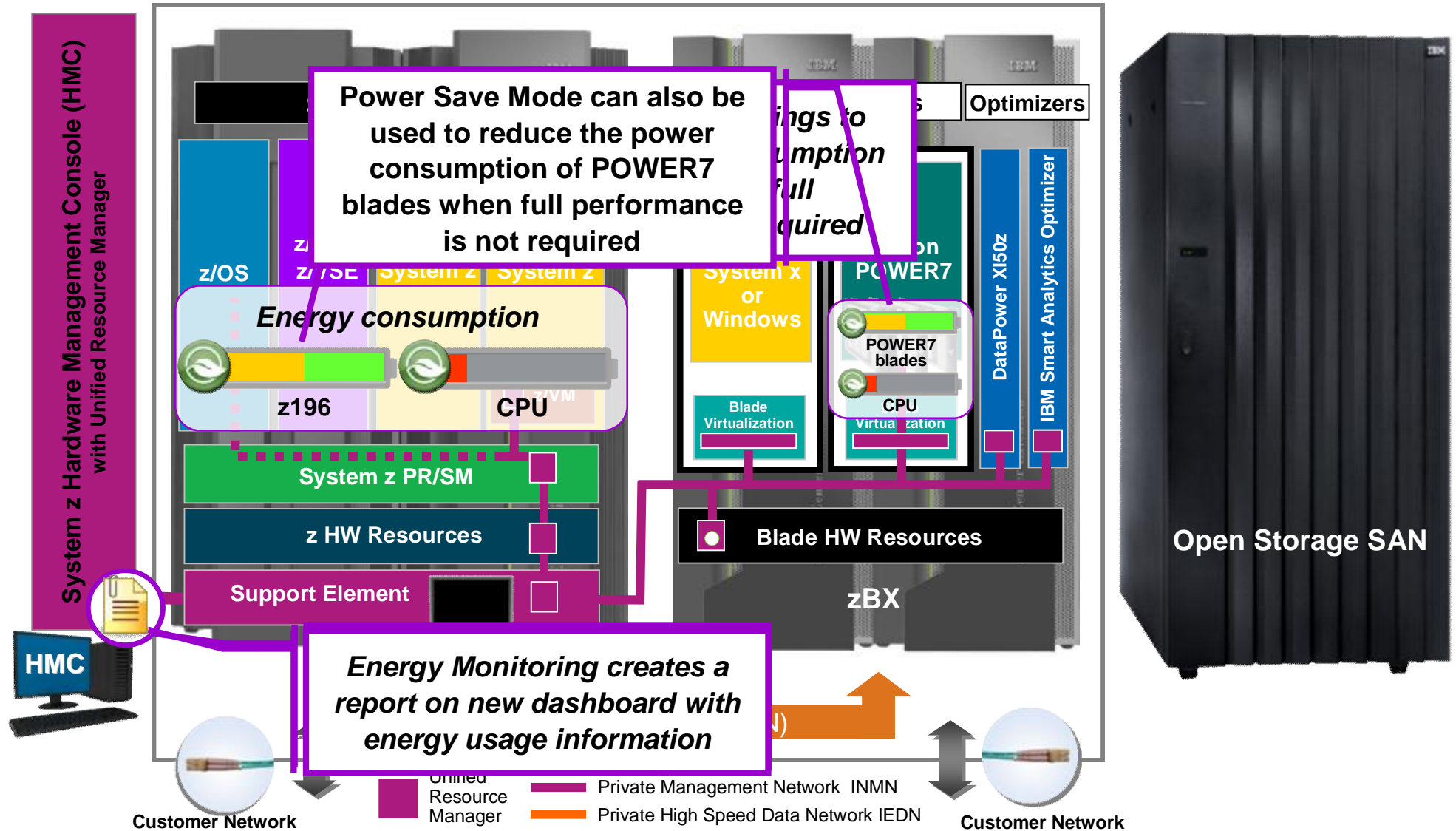
§ zEnterprise exploitation

- **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



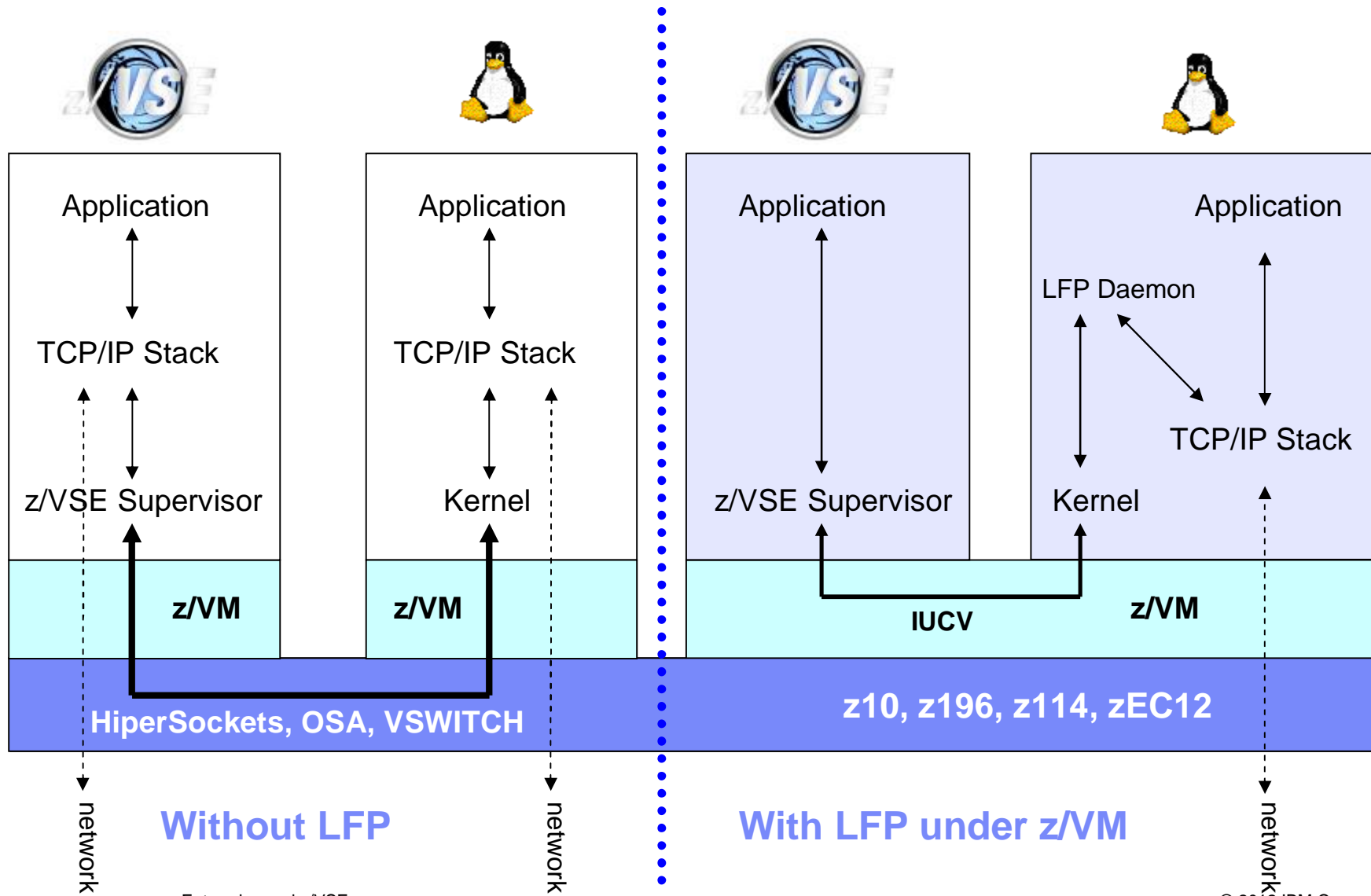
Static Power Save Mode - Supported by z/VSE 4.2 + 4.3 + 5.1

Energy Management on z196 and zEC12



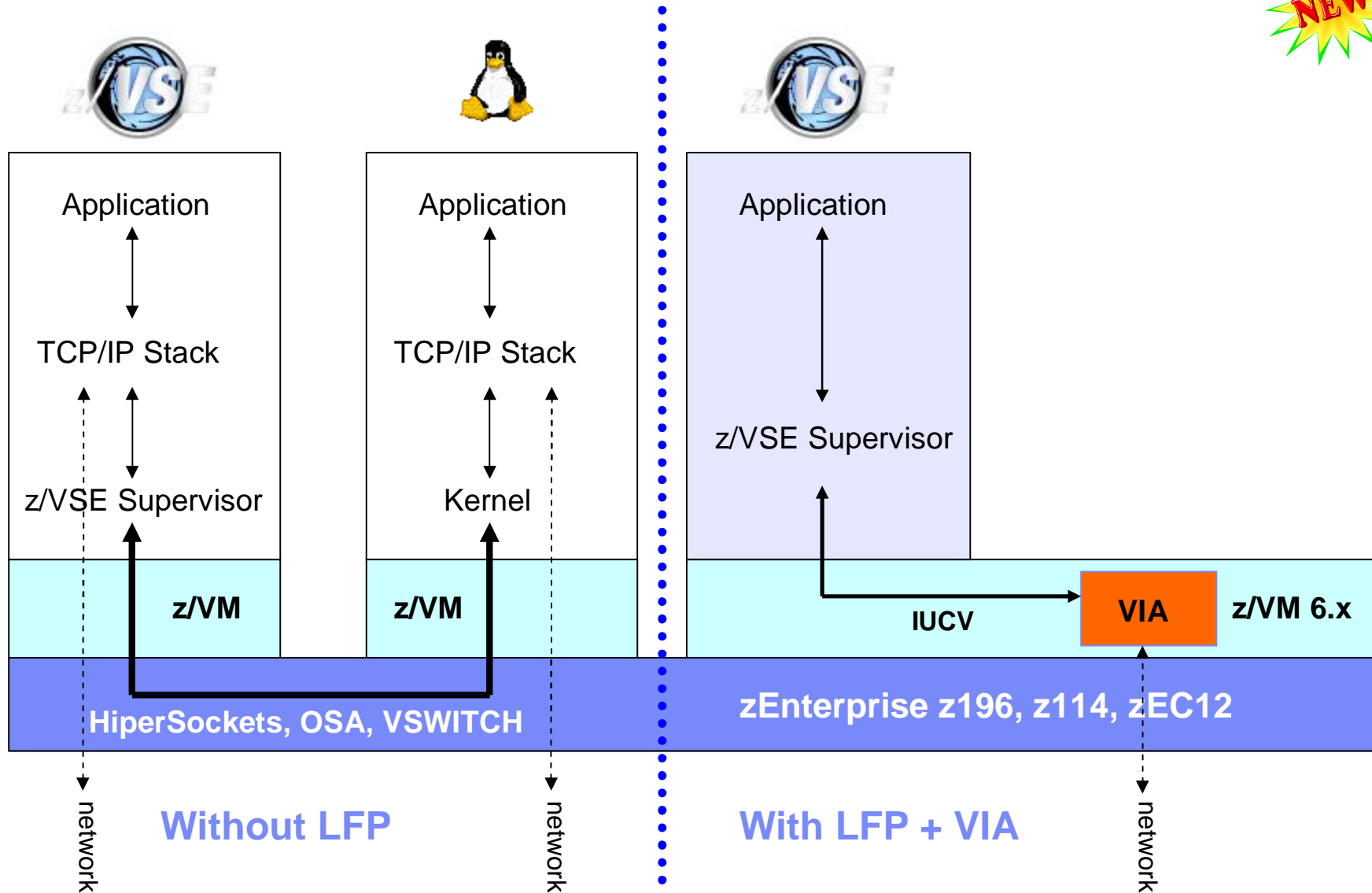
Linux Fast Path in a z/VM environment - Supported by z/VSE 4.3 + 5.1

Faster communication between z/VSE and Linux applications



z/VSE z/VM IP Assist (VIA) - Supported by z/VSE 5.1 with z/VM 6.x

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

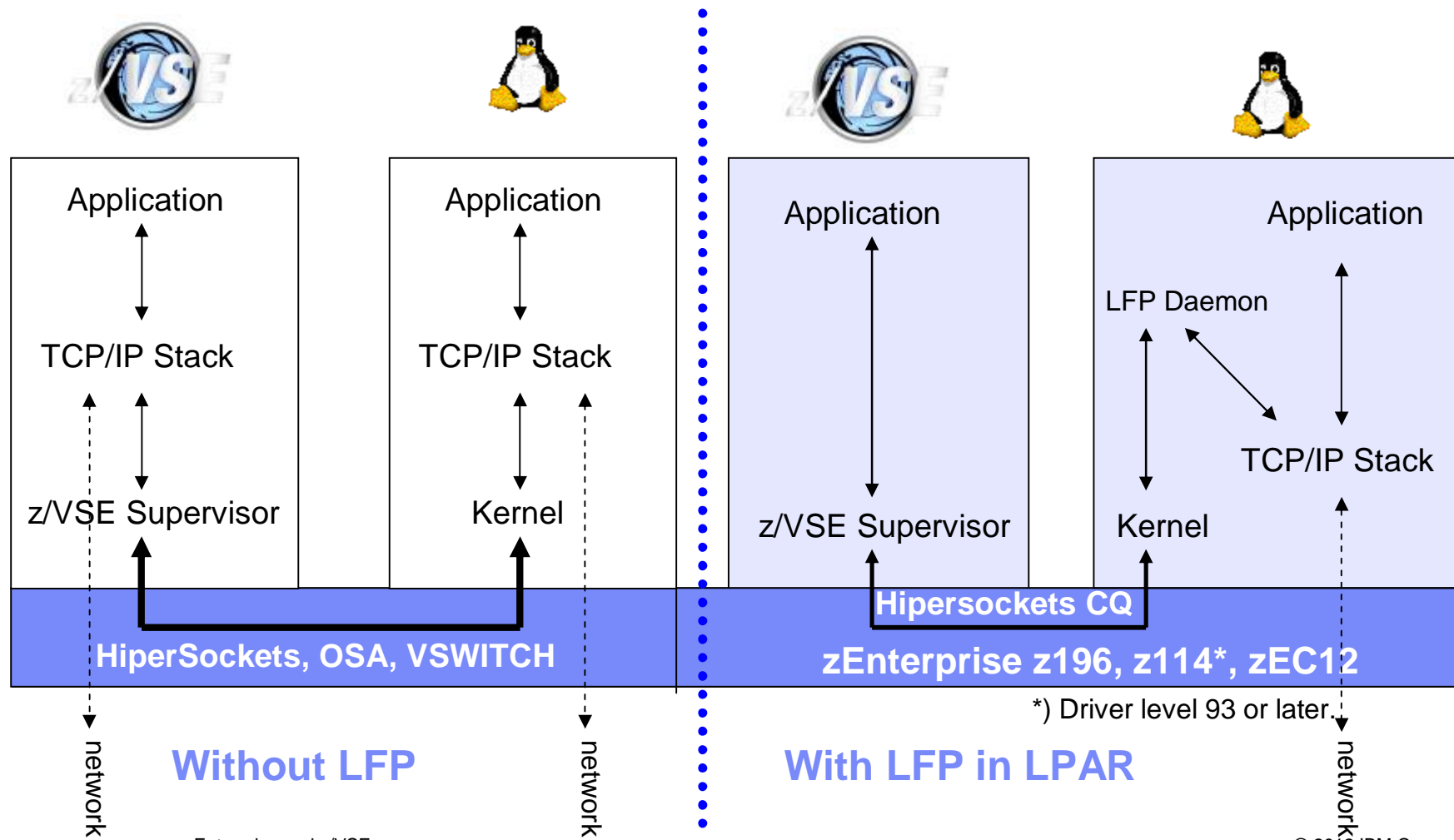


Linux Fast Path in an LPAR environment - Supported by z/VSE 5.1 + PTFs

Faster communication between z/VSE and Linux applications



à Exploits the HiperSockets Completion Queue support of IBM zEnterprise



Dynamic Add of CPs and Large Pages - Supported by z/VSE 4.3 + 5.1

§ Dynamic add of logical CPs*

- Ability to dynamically add logical CPs without preplanning
- Allows adding central processors (CPs) to LPAR without re-IPL of the z/VSE system
- Clients can increase (and decrease) the capacity of their z/VSE system dependent on workload needs

§ Large page (1 megabyte page) support for data spaces*

- Better exploitation of large processor storage
- Might result in better performance for long-running applications
- Transparent to applications



**) Not available in a z/VM guest environment*

Dynamic Add / Remove of Crypto Engines - Supported by z/VSE 4.3 + 5.1

§ System z10, z196, z114, zEC12

- **Add / Remove of an AP (Crypto card) without having to reactivate the LPAR**
- Dynamically adding an AP to an LPAR for the first time
- Dynamically adding an AP to an existing LPAR already using crypto
- Dynamically removing an AP from an LPAR when it is no longer needed
- Dynamically changing the AP queue number

```
msg FB,data=apadd ap=1  
AR 0015 1I40I READY  
FB 0011 1J025I AP 1 ENABLED SUCCESSFULLY.
```



Crypto AP-Queue Interrupt Facility - Supported by z/VSE 4.3 + 5.1

§ Crypto Adjunct Processor (AP) Queue Interrupt Facility

- Exploitation of the z10 and zEnterprise functionality
- **Reduced CPU consumption and elapsed job time** dependent on workload
- New AP Interrupt commands provided by the z/VSE crypto device driver
- AP-Queue status displayed via the crypto STATUS command:

```

msg FB,data=status=cr
AR 0015 1I40I  READY
FB 0011 BST223I CURRENT STATUS OF THE SECURITY TRANSACTION SERVER:
FB 0011 ADJUNCT PROCESSOR CRYPTO SUBTASK STATUS:
FB 0011  AP CRYPTO SUBTASK STARTED ..... : YES
FB 0011  MAX REQUEST QUEUE SIZE ..... : 1
FB 0011  MAX PENDING QUEUE SIZE ..... : 1
FB 0011  TOTAL NO. OF AP REQUESTS ..... : 40065
FB 0011  NO. OF POSTED CALLERS ..... : 40065
FB 0011  AP-QUEUE INTERRUPTS AVAILABLE ..... : YES
FB 0011  AP-QUEUE INTERRUPTS STATUS ..... : DISABLED
FB 0011  AP CRYPTO POLLING TIME (1/300 SEC).. : 0
FB 0011  AP CRYPTO WAIT ON BUSY (1/300 SEC).. : 75
FB 0011  AP CRYPTO RETRY COUNT ..... : 5
FB 0011  AP CRYPTO TRACE LEVEL ..... : 3
FB 0011  TOTAL NO. OF WAITS ON BUSY ..... : 0
...

```

4096-bit RSA Key Support w/ Crypto Express3 - Supported by z/VSE 5.1

§ 4096-bit RSA Key Support (previously up to 2048-bit)

- **Enhanced SSL network security** for AES-128 encryption
- **Enhanced data security** for DISK and TAPE with Encryption Facility support

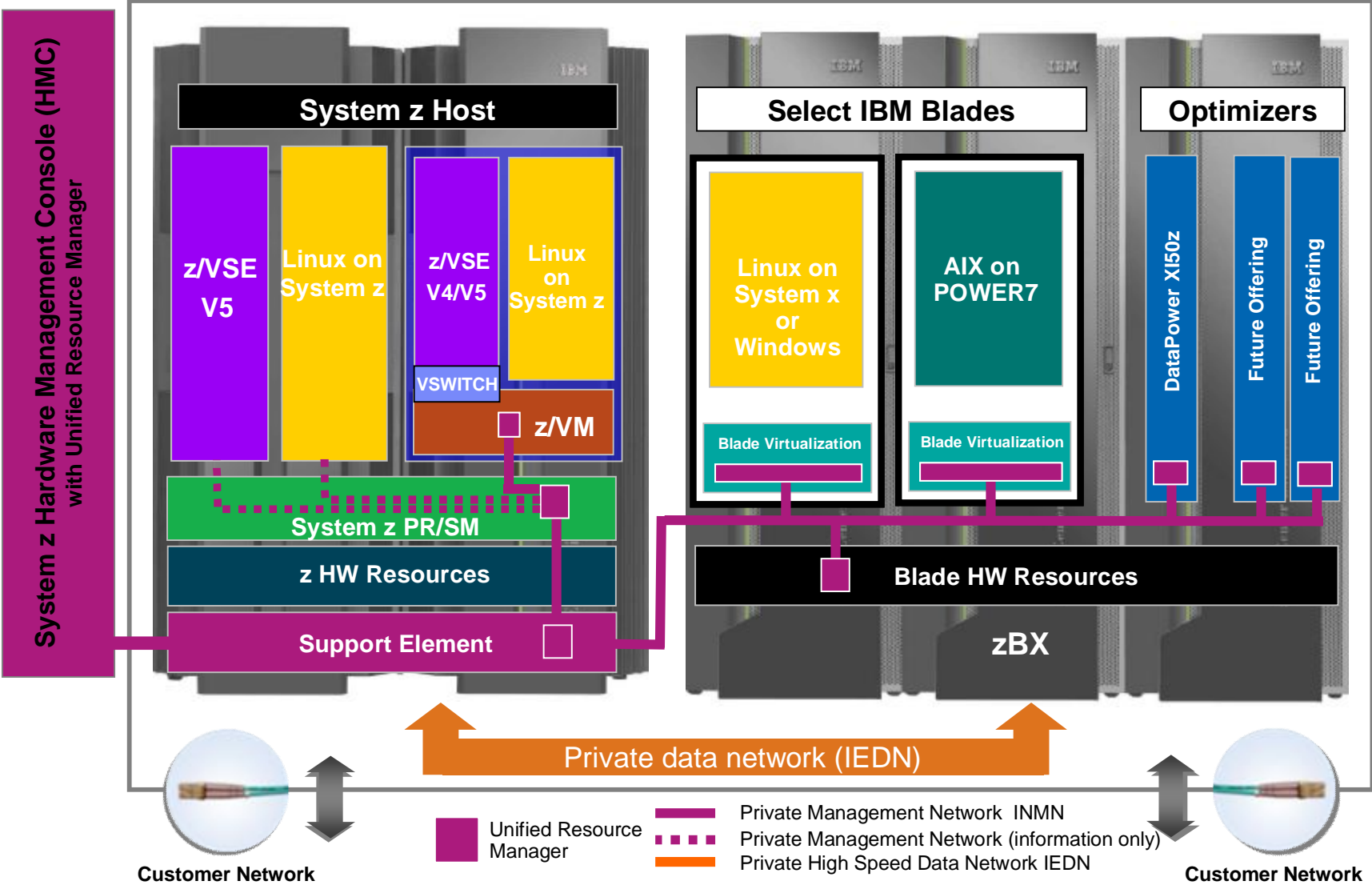
Encryption strength equivalent	
Asymmetric key size (bits)	Symmetric key size (bits)
1024-bit RSA	80
2048-bit RSA	Triple DES (112)
3072-bit RSA	AES-128
4096-bit RSA	n/a

§ z/VSE Crypto Express 3 exploitation in coprocessor mode (CEX3C)


- New z/VSE crypto device driver allows to generate RSA keys directly on the mainframe
- Higher Security by generation of **“true random numbers”**



IEDN to zBX - Supported by z/VSE 5.1



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- § **Wrap-up**





z114 Pricing Strategy: Enhance Platform Competitiveness

<i>Our customers are focused on ...</i>	<i>IBM taking action ...</i>
<p>Price performance on the stack, pricing linked to increased capability and performance</p>	<ul style="list-style-type: none"> § Deliver price performance on Hardware, Software, and Maintenance § Introduce \$75k z114 Hardware Entry Price (down 25% from z10 BC) § z114 Unified Resource Manager priced per connection
<p>TCA and short term ROI and cost savings</p>	<ul style="list-style-type: none"> § Memory - Cutting prices by 75% versus z10 BC, and instituting upgrade charge § Specialty Engines - Cutting IFL prices by 27% (zIIP's/zAAP's by 16%) versus z10 BC, and instituting upgrade charge
<p>MLC software savings and unit cost improvement</p>	<ul style="list-style-type: none"> § Announcing new metric “Advanced Entry Workload License Charges” (AEWLC) § Providing price performance of up to 18% versus z10 BC for z/OS workloads, and up to 5% versus z10 BC for z/VSE workloads
<p>Competitive pricing for new workloads versus off-platform alternatives</p>	<ul style="list-style-type: none"> § Continue Solution Edition strategy to aggressively compete for new workloads & applications
<p>Financial benefit when growing capacity on the platform</p>	<ul style="list-style-type: none"> § Providing incremental stack savings for stack capacity growth

Note: Items marked in 'blue' are of relevance to z/VSE, z/VM, and/or Linux on System z.



z114 Pricing compared to z10 BC - IFL, zIIP/zAAP, Memory

<i>Component</i>	Approx. % Increase z114 over z10 BC	z114 Pricing (Street)	z10 BC Pricing (Street)	% Price Reduction (z114 Over z10 BC)	z10 BC Upgrade Costs (\$K)	% Price Performance Improvement
<i>IFL</i>	16% (in MIPS)	\$35K/Eng.	\$47.5K/Eng.	26%	\$5/Eng.	58%
<i>zAAP/zIIP</i>	16% (in MIPS)	\$40K/Eng.	\$47.5K/Eng.	16%	\$6/Eng.	40%
<i>Memory (Traditional Workloads)</i>	3% (in TBs)	\$1.5K/GB	\$6K/GB	75%	\$.75/GB*	N/A
<i>Memory (New Workloads)</i>	3% (in TBs)	\$1.5K/GB	\$2.25K/GB	33%	\$.75/GB*	N/A

Note (*) – 8GB or 16GB to carry forward free on upgrade, depending on z10 BC memory configuration

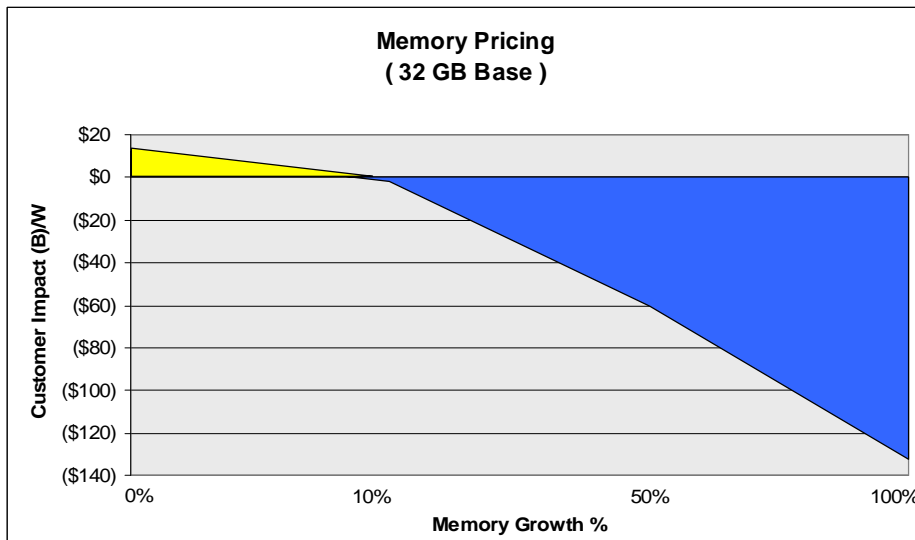
Source: IBM, with Clipper computations

Source: Clipper Group Report TCG2011024LI



Memory and IFL Pricing on z114 *Aligning with industry practice*

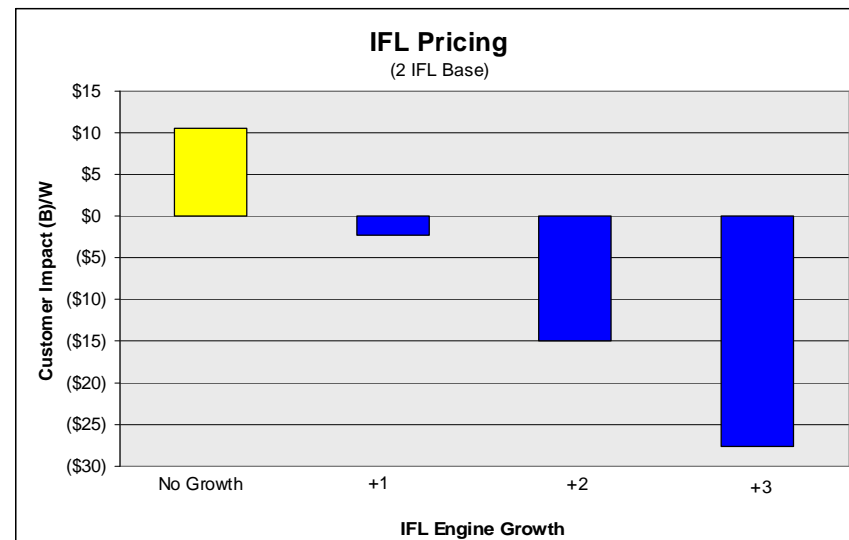
- Reduce memory price from \$6k/GB and \$2,25k/GB for new workload on z10 BC to \$1,5k/GB for all workloads on z114
- Customers “repurchase” memory on upgrade at 50% (\$750/GB Street Price) of purchase price



- A customer with 32 GB of memory on a z10 BC would be better off with the methodology change if memory is increased by 10% when upgrading to z114.

- Reduce per engine street price for an IFL from \$47.5k on z10 BC to \$35k on z114
- Introduce upgrade fee for upgrades from older technology to z114/z196 to make up for the increased performance of new engines

	IFL		zIIP/zAAP		ICF	
	z114	z196	z114	z196	z114	z196
Upgrade from z10	\$5k	\$17k	\$6k	\$30k	\$20k	\$57k
Upgrade from z9	\$10.5k	\$33k	\$12k	\$60k	\$39k	\$114k

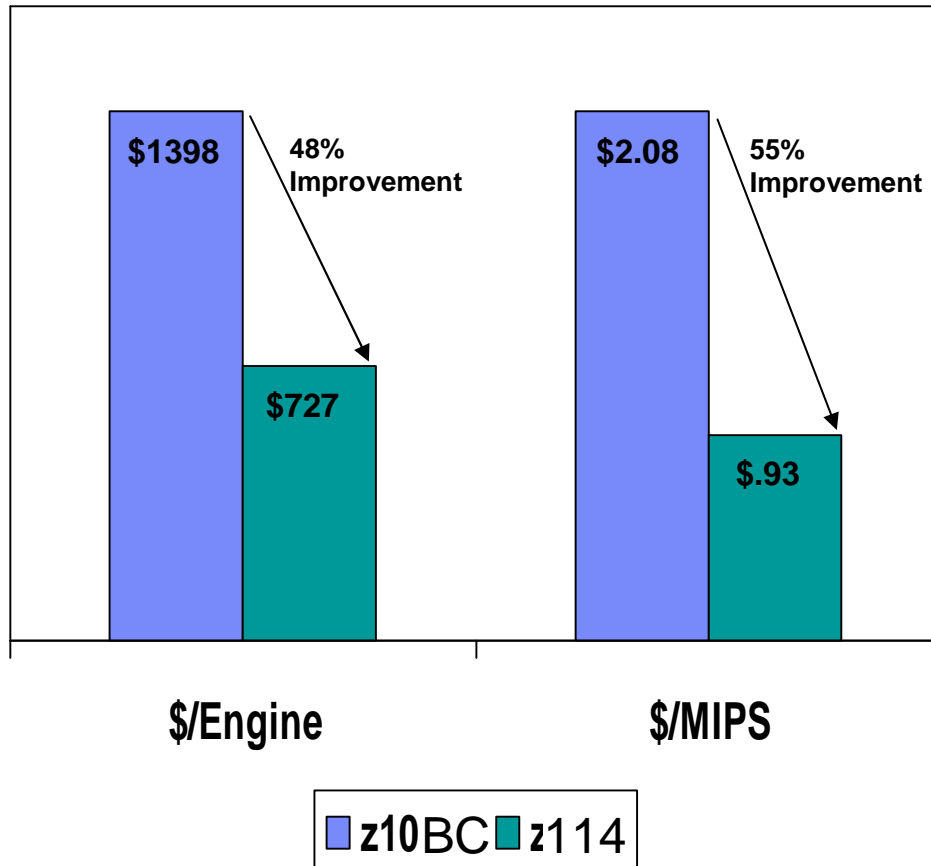


- A customer with 2 IFL's on a z10 BC would be better off with the methodology change if 1 IFL is added when upgrading to z114.

Note 1: First 8 GB free or up to 16 GB carry forward free.
 Note 2: All prices are US prices, will vary by GEO.

IFL Maintenance Pricing on z114

Deliver significant price performance



§ z10 BC strategy is to deliver price performance

- Via greater engine size
- Via improved delegation

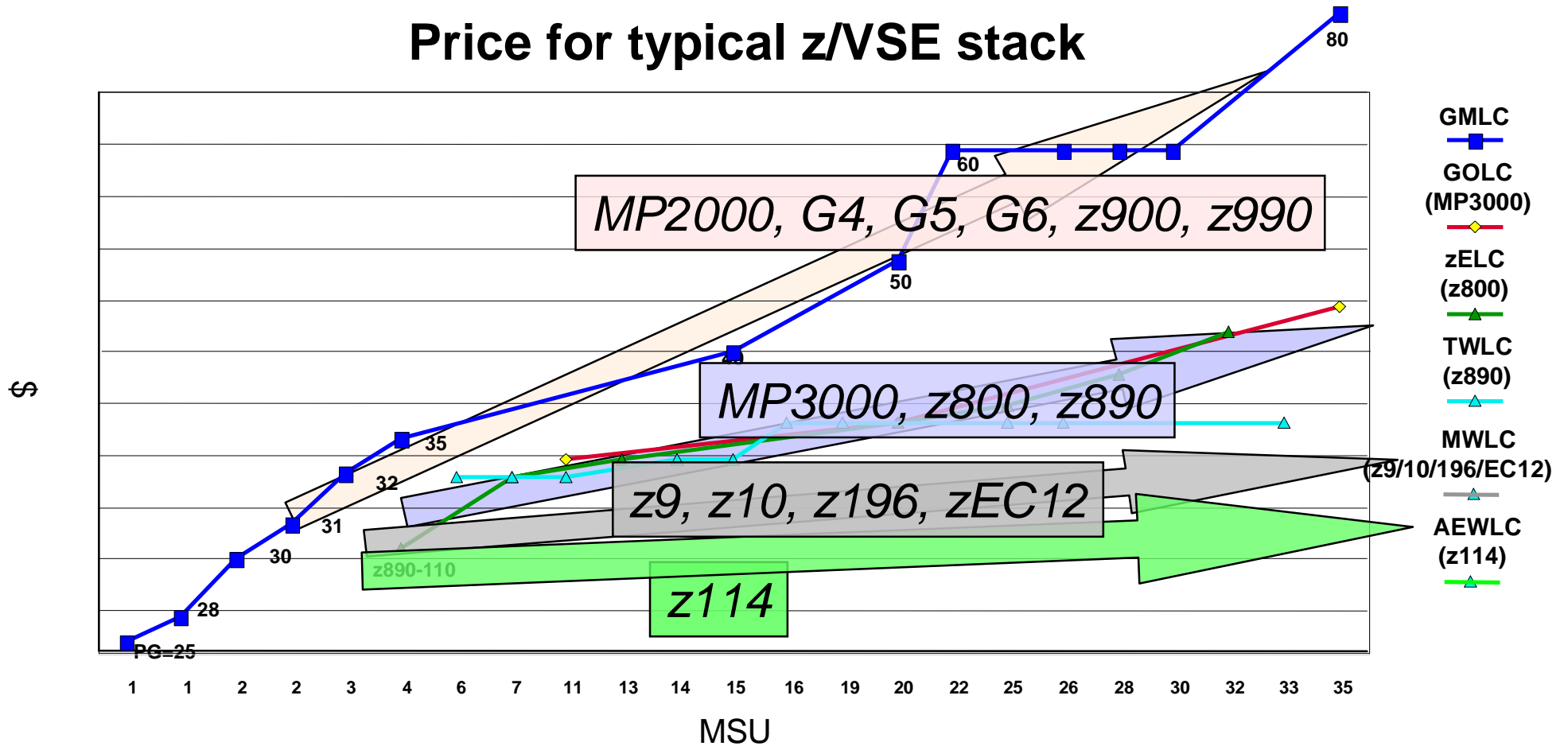
§ z114 strategy is to deliver price performance:

- Via greater engine size
- Via list price reduction

* All prices are US prices, will vary by GEO.

AEWLC – Advanced Entry Workload License Charge on z114

Price for typical z/VSE stack



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



With upgrade from z10 BC, new AEWLC curve may provide MLC price/performance up to 5% for MWLC stacks

Total MLC savings will vary significantly by customer based on Sub-capacity and specific software stacks, actual customer configuration must be priced out to be accurate

Visible savings are at a Software Stack level, and may differ for individual products or features.

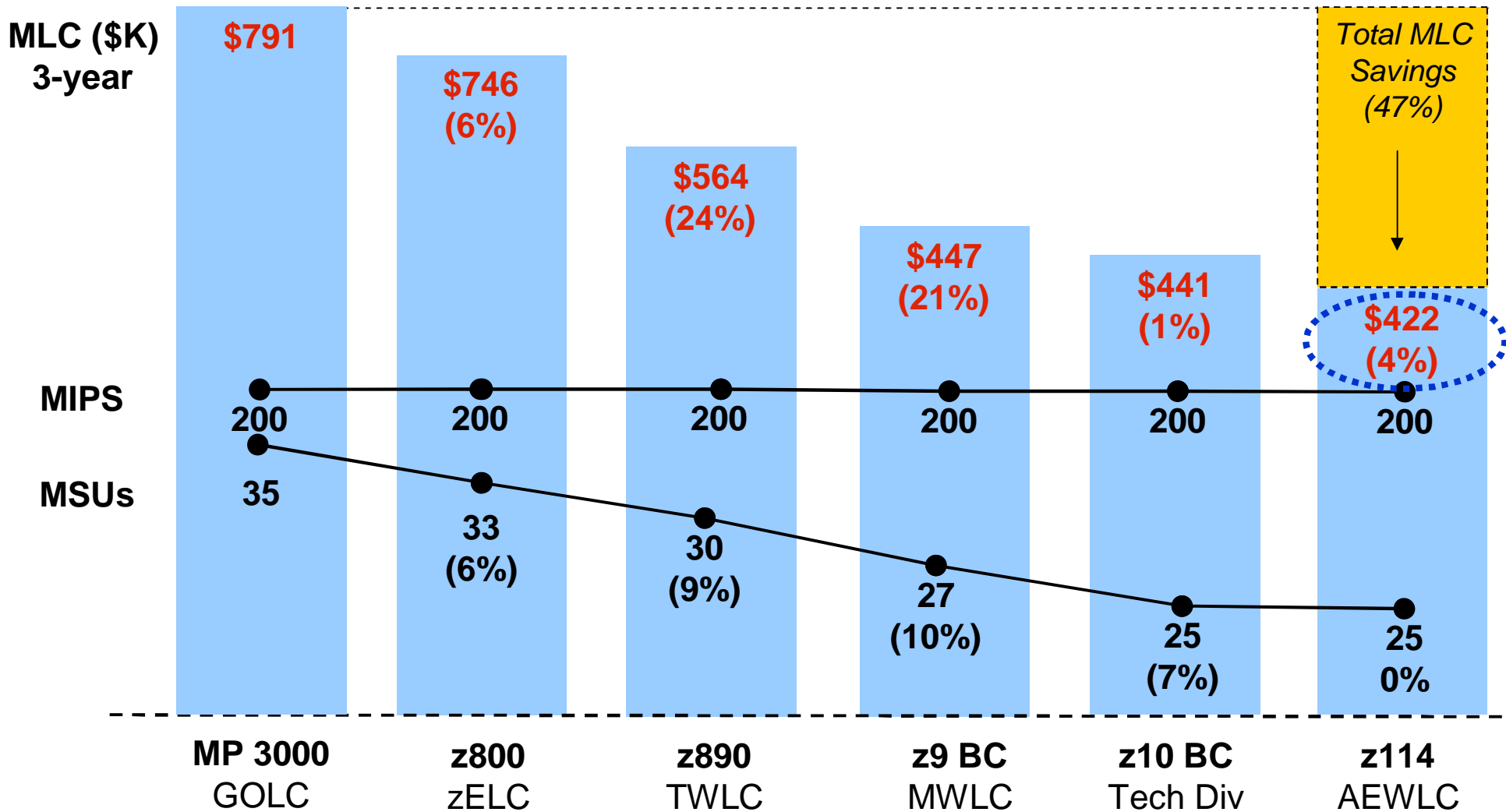
Sample market segment ranges	Savings for a Sample Stack of z/VSE SW: MWLC on z10BC to AEWLC on z114
(3 msus)	0%
4-17 MSUs	-2%
18-30 MSUs	-4%
31-45 MSUs	-4%
46-87 MSUs	-5%
88+ MSUs	-5%

← *Majority of z/VSE customers will see savings from 2-4%*

	MSUs	MWLC	AEWLC	Savings		MSUs	MWLC	AEWLC	Savings
z/VSE Central Functions,	5	2,207	2,187	0.91%		15	2,837	2,717	4.23%
CICS TS for VSE/ESA	5	1,908	1,892	0.84%		15	2,448	2,352	3.92%
Stack Total:		4,115	4,079	0.87%			5,285	5,069	4.09%
	MSUs	MWLC	AEWLC	Savings		MSUs	MWLC	AEWLC	Savings
z/VSE Central Functions,	20	3,026	2,880	4.82%		50	3,656	3,450	5.63%
CICS TS for VSE/ESA	20	2,610	2,495	4.41%		50	3,150	3,005	4.60%
Stack Total:		5,636	5,375	4.63%			6,806	6,455	5.16%

MLC Price Performance across HW Generations for z/VSE

* 200 MIPS example for a typical z/VSE stack

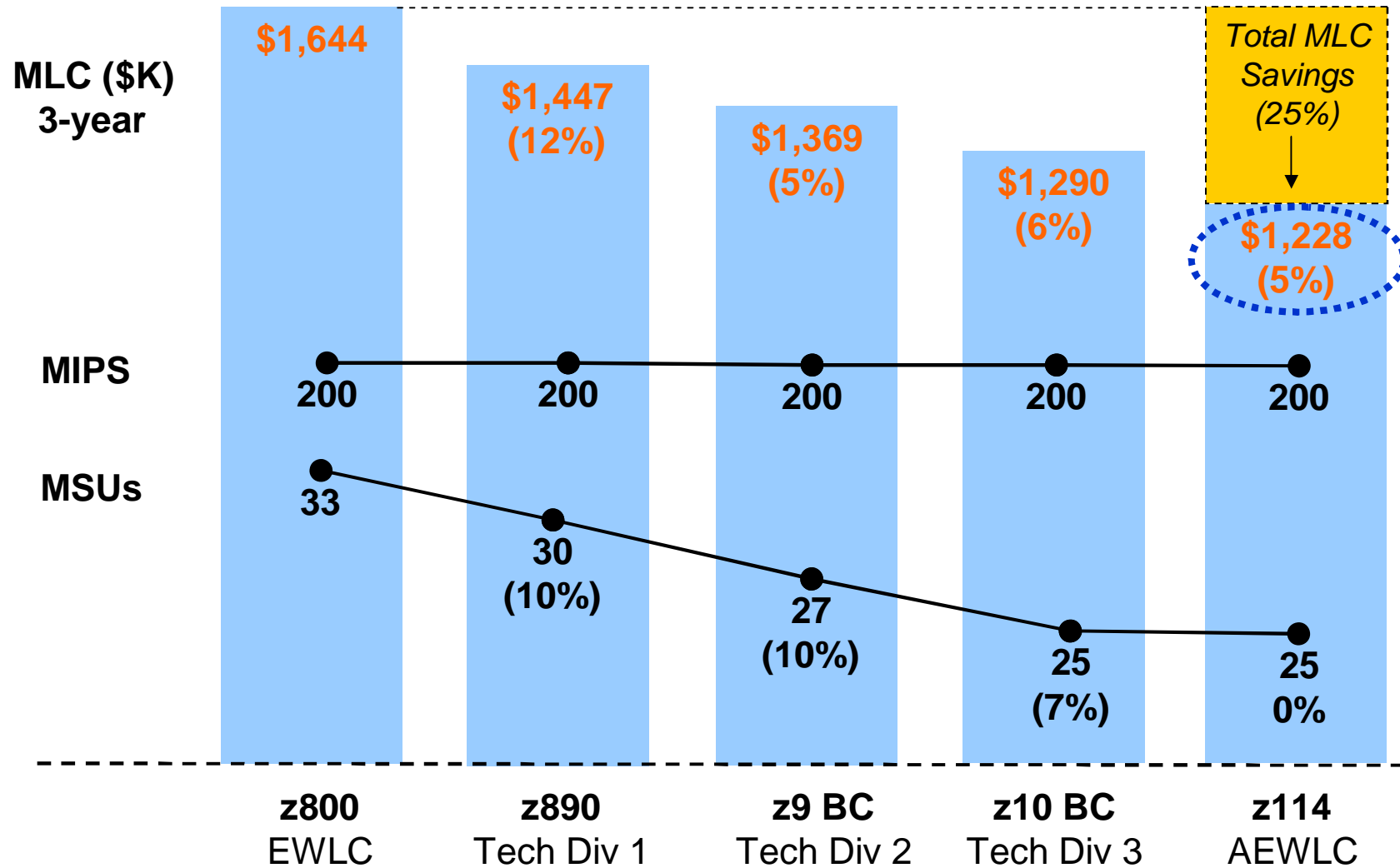


* MLC savings will vary significantly by customer - actual customer configuration must be priced out to be accurate.

* A typical z/VSE stack includes z/VSE CF, CICS TS, VTAM, TCP/IP, DB2, Ditto, Cobol, HLASM

MLC Price Performance across HW Generations for z/OS

* 200 MIPS example for a typical z/OS stack

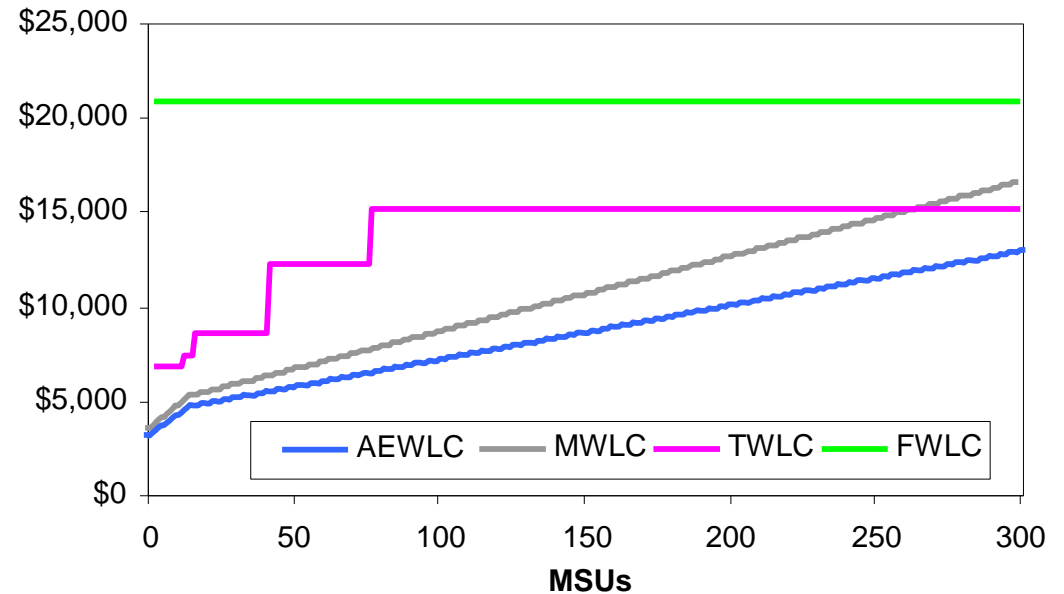


* MLC savings will vary significantly by customer - actual customer configuration must be priced out to be accurate.

Improved TCO through new Pricing Metric and Sub-Capacity Pricing

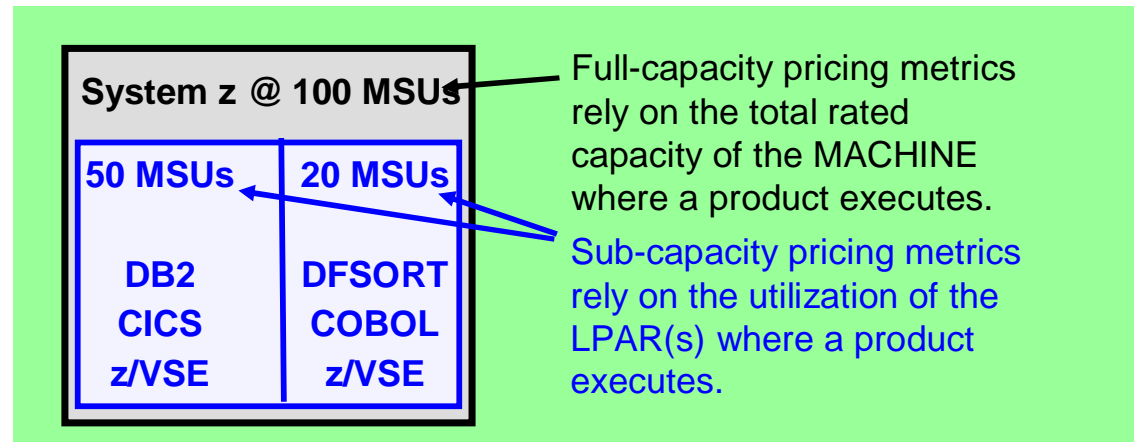
§ z/VSE price/performance through new pricing metric

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



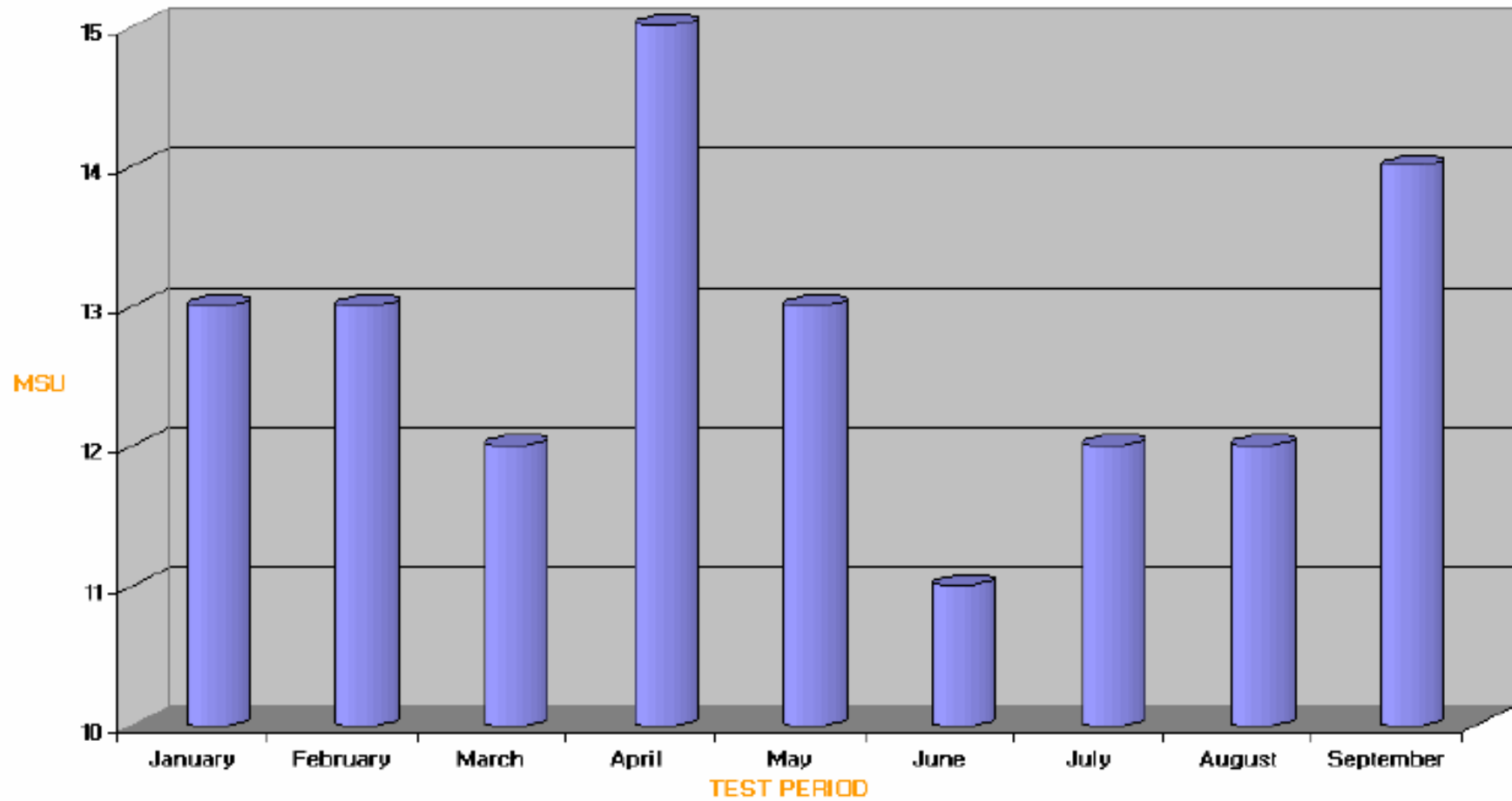
§ Additional price/performance through sub-capacity option

- Some hardware footprint **consolidations** more attractive now
- Presence of z/VSE V3 or VSE/ESA™ forces full-capacity pricing



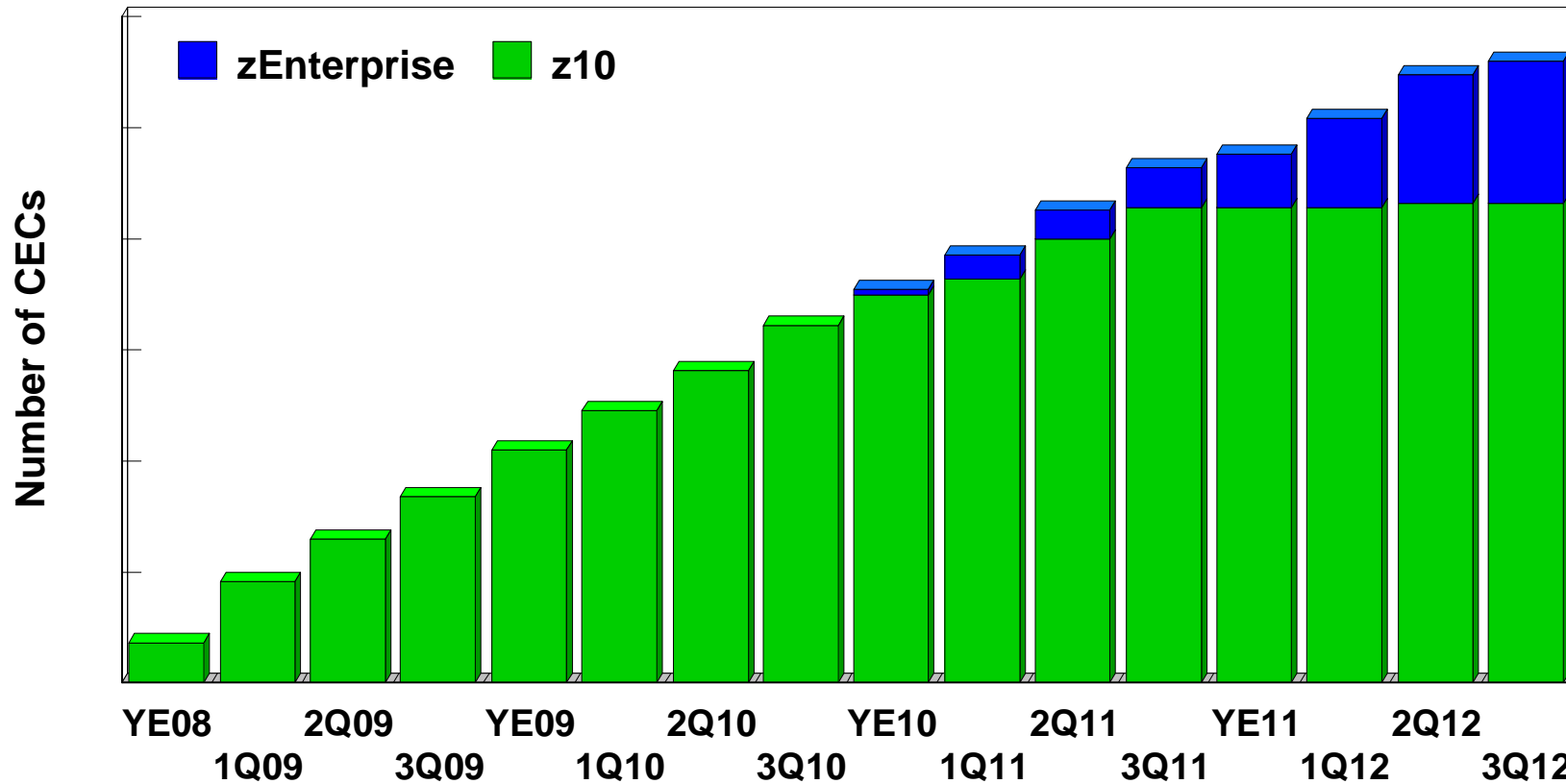
(*) z9 BC A01, z10 BC A01, and z114-A01 are priced zELC.

Sub Capacity Reporting Tool: Sample Report



z/VSE Software Pricing continues to drive z10 and zEnterprise Adoption

z10/z196/z114 CECs with z/VSE



PVU Table

Processor Value Units

PVU Website Link:
[click here](http://ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html)

http://ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

Notes:

- 1) Each Integrated Facility for Linux (IFL) or Central Processor (CP) engine is equivalent to 1 processor core.
- 2) Refers to System z9, eServer zSeries, or System/390 servers.
- 3) Entitlements required for Power Processor Element (PPE) cores only.
- 4) The PVU requirement for the POWER7 processor technology is dependent on the maximum possible number of sockets on the server.
- 5) z196 refers to IBM zEnterprise 196
- 6) z114 refers to IBM zEnterprise 114

PVU Table per Core (section 1 of 2 - RISC and System z)

Processor Technologies										PVUs per Core			
Processor Vendor	Processor Brand			Processor Type							Proc. Model Number		
	Processor Name	Server model numbers	Maximum number of sockets per server	Cores per socket									
				One-Core (1)	Dual-Core (2)	Quad-Core (4)	Hexa-Core (6)	Oct-Core (8)	16-Core (16)			IFL Engine	
IBM	POWER7 ⁴	770,780,795	> 4			■	■	■			All	120	
		750,755,775	4					■	■		All	100	
		PS704							■	■		All	70
	POWER6	PS700-703, 710-740	2					■	■			All	70
		550,560,570, 575,595	All					■				All	120
	POWER5	520, JS12, JS22, JS23, JS43	All					■				All	80
		POWER4	All	All				■				All	100
	POWER5 QCM	All	All						■			All	50
	z196, zEC12	All	All								■	All	120
	System z10 ^{1,5}	All	All								■	All	100
z114, System z9	All	All								■	All	100	
z990, S/390 ^{1,2,6}	All	All									All	50	
PowerPC 970	All	All								■	All	30	
PowerXCell™, Cell/B.E.™ 8i ³	All	All		■							All	30	
HP / Intel®	Itanium® 1,2	All	All			■	■				All	100	
	PA-RISC	All	All			■					All	100	
Sun / Fujitsu	SPARC64 VI, VII	All	All			■	■				All	100	
	UltraSPARC IV	All	All			■					All	100	
	SPARC T3	All	All						■	■	All	70	
	UltraSPARC T2	All	All						■	■	All	50	
UltraSPARC T1	All	All						■	■	All	30		
Any	Any single-core	All	All	■							All	100	

System z

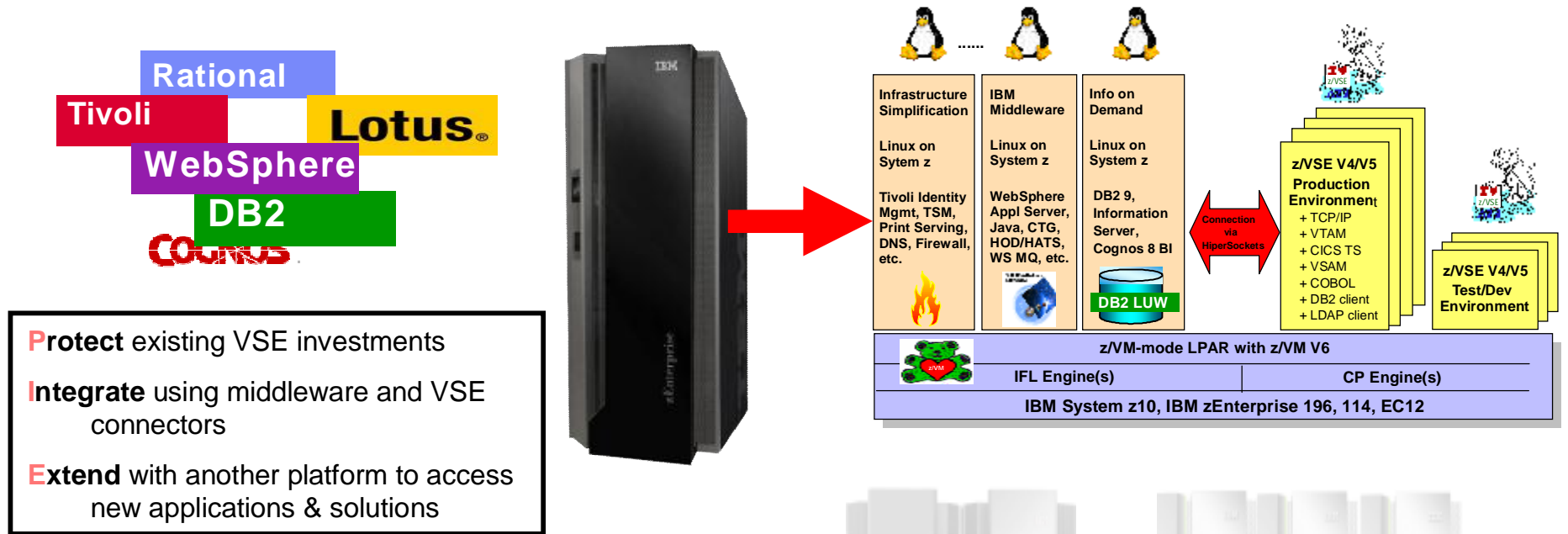
* Requirements as of Publish Date: July 12, 2011

Agenda

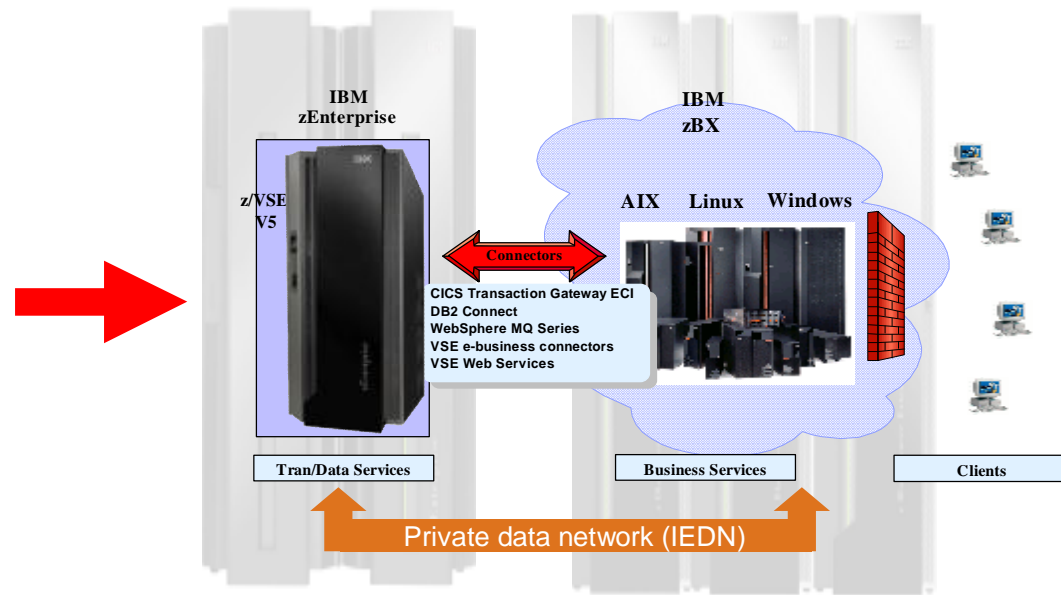
- § **IBM zEnterprise**
 - z196, z114, zEC12
 - zBX
 - zManager
- § **z/VSE Strategy and how it relates to zEnterprise**
 - Hybrid
 - PIE
- § **z/VSE Exploitation of zEnterprise**
 - z/VSE V5.1
 - z/VSE V4.3
- § **Pricing Strategy on z114**
 - Hardware Pricing
 - Software Pricing
- § **Wrap-up**



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



- P**rotect existing VSE investments
- I**ntegrate using middleware and VSE connectors
- E**xtend with another platform to access new applications & solutions



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

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

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

At the bottom of the list, it states: 'Planned availability is June 15, 2012. 64-bit I/O and IPv6/VSE enhancements PTFs will be made available at a later date.' The right sidebar contains several widgets: 'We're here to help' with an 'E-mail us' button; 'Stay informed' with a 'Get the latest news about z/VSE through Twitter' link; 'Mark your calendar' with a 'WAVY 2012' event (April 13-17, 2012, Covington, Kentucky, USA) and an 'Enroll now' link; and 'Announcing' with an image of an IBM zEnterprise 114 server and the text 'Introducing IBM zEnterprise 114 (z114). Bringing the zEnterprise hybrid computing model to clients of all sizes.' with a 'Learn more' link.