z/VSE V4 Software Pricing

Session ID: zEG04

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z/VSE Evolution
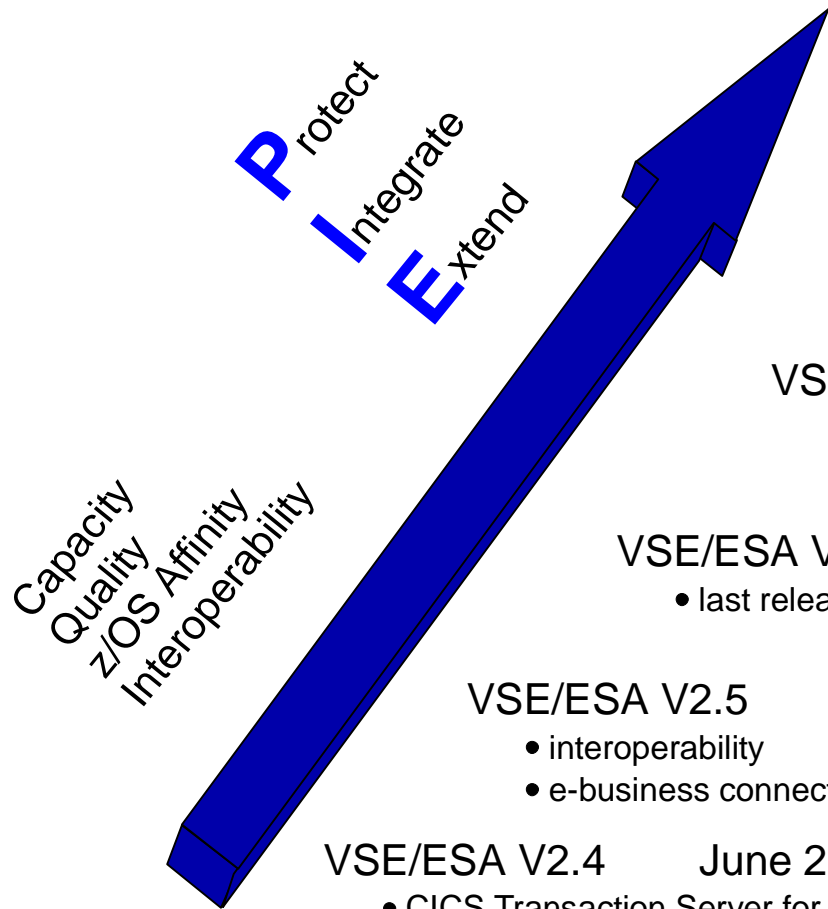
z/VSE V4.2   Oct 17, 2008
- **More tasks, PAV, LDAP Client, SVC**
- **SoD for CICS/VSE, EGL, WMQ**

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

Protect
Integrate
Extend

Capacity
Quality
z/OS Affinity
Interoperability

- Note: 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.

Agenda

§ **Midrange Workload License Charge (MWLC)**

§ **Sub-Capacity Pricing Option**

§ **Implementation Details**

§ **Enhancements 2009**

§ **Summary**

Midrange Workload License Charge (MWLC)

§ **New software pricing, exclusively for z/VSE customers**

§ **Requires current hardware (System z9 EC/BC or z10 EC/BC) <u>and</u> z/VSE V4**

– Exception:

z9 BC Capacity Setting A01 remains zELC

z10 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

§ **Announced:** **January 9, 2007**

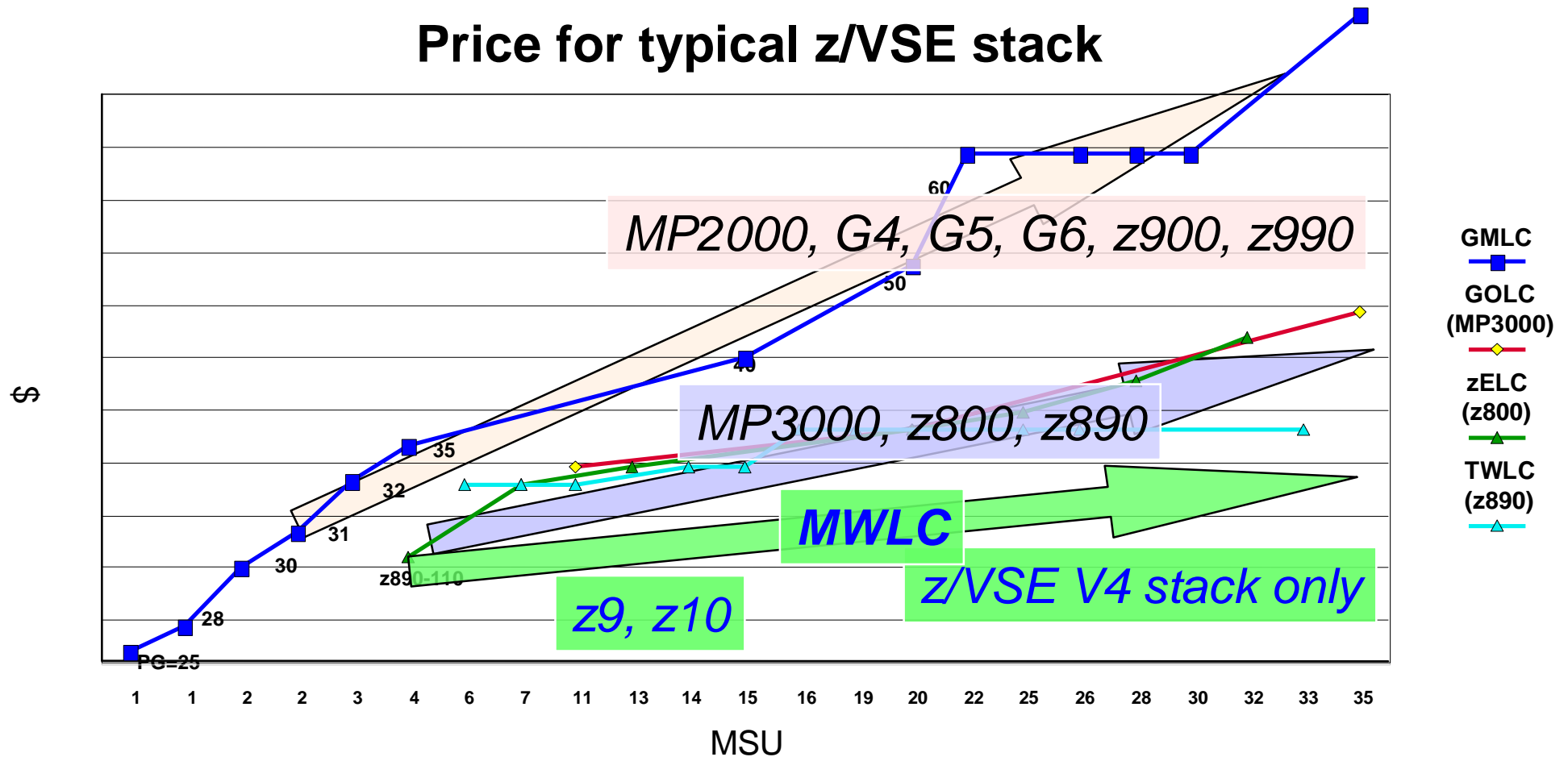§ **Available:** **March 16, 2007**
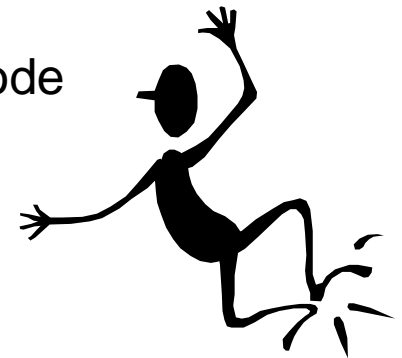
MWLC is driving z9/z10 Adoption with z/VSE V4

z9/z10 CECs with z/VSE V4
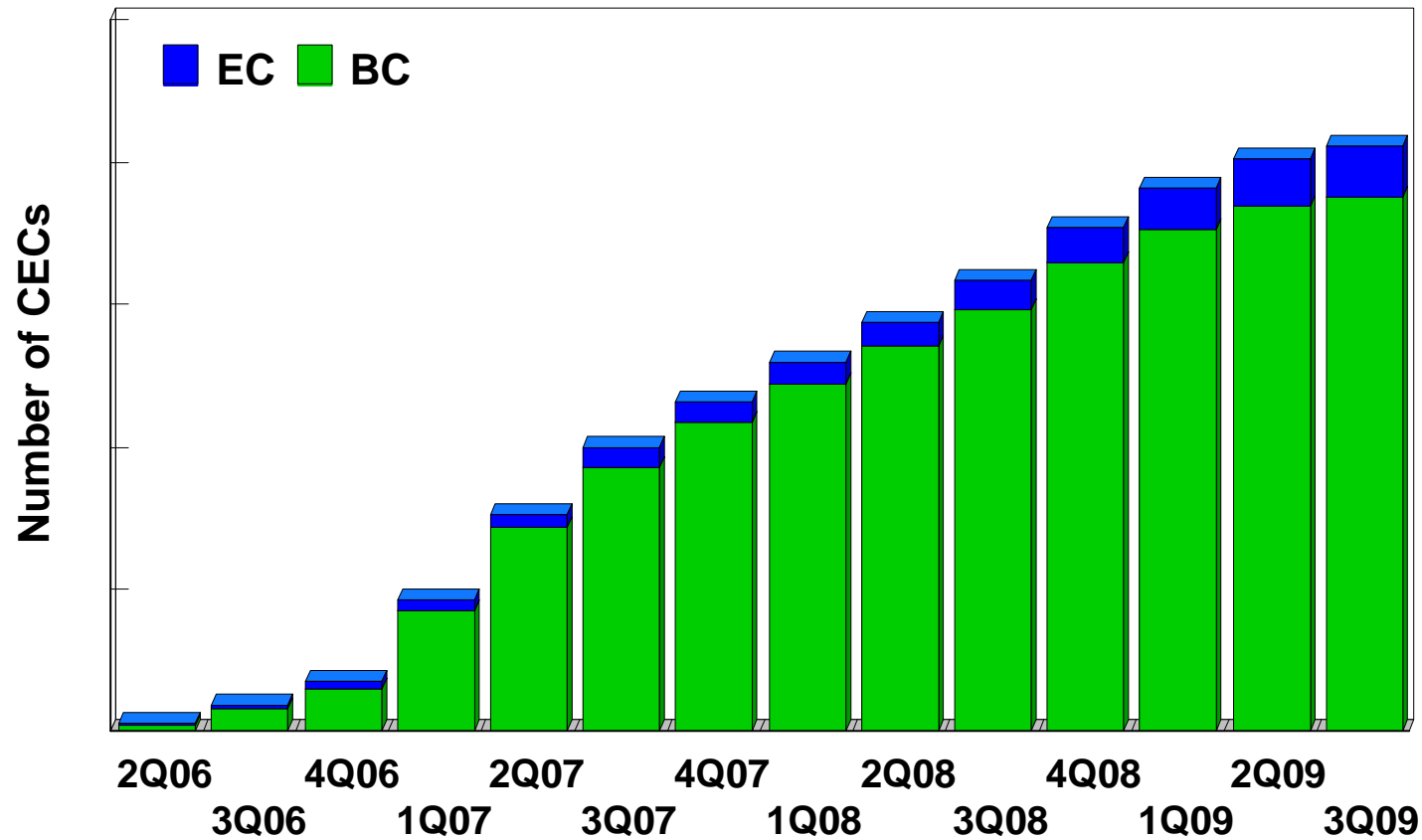
What does MWLC do to Price/Performance ?

Price for typical z/VSE stack

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

Midrange Workload License Charges for z10 BC*

for Sub-Capacity Eligible Products

Midrange Workload License Charges (MWLC)

for non-Sub-Capacity Eligible Products

Tiered EWLC Price Structure (TWLC)

Full Cap mode - use rated MSU capacity
 or
Sub-Cap mode - use MSU values from
sub-capacity reports

MWLC Price Structure
exclusive to z9 BC/EC, z10 BC/EC

base	3 MSUs
Level 1	4 - 17 MSUs
Level 2	18 - 30 MSUs
Level 3	31 - 45 MSUs
Level 4	46 - 87 MSUs
Level 5	88 - 175 MSUs
Level 6	176 - 260 MSUs
Level 7	261+ MSUs

cumulative monthly pricing

TWLC Price Structure**
exclusive to z9/z10 BC and z890

Tier A	1 - 11 MSUs
Tier B	12 - 15 MSUs
Tier C	16 - 40 MSUs
Tier D	41 - 75 MSUs
Tier E	76 - 1500 MSUs
Tier F	1501+ MSUs

flat monthly pricing - select the tier
based on the MSU rating of your box

* z9 BC A01 and z10 BC A01 are not eligible for MWLC, they are priced using zELC.

** z9 EC and z10 EC models do not use TWLC, they use Flat Workload License Charges (FWLC) when applicable.

Example: MWLC Price Points

	TWLC	MWLC							
Product **[MSU]**	**TWLC Tier A** **1-11**	**Base** **3**	**Level 1** **4-17**	**Level 2** **18-30**	**Level 3** **31-45**	**Level 4** **46-87**	**Level 5** **88-175**	**Level 6** **176-260**	**Level 7** **261+**
VSE Central Function V8	4162	2081	63	21	21	21	21	21	21
CICS TS if used w/ z/VSE V4	2534	1800	54	18	18	18	18	18	18

Examples:

z9 BC D02, 16 MSUs (~ 115 MIPS): Cost of CICS TS on z/VSE V4 = Base + (13 * Level1)   = $2.502,--

**z9 BC I01, 21 MSUs (~ 150 MIPS): Cost of VSE CF V8 = Base + (14 * Level1) + (4 * Level2) = $3.047,--**

*Prices subject to change without notice; all prices shown in USD as of Jan 2007.

VSE-related Products eligible for MWLC

1. **z/VSE V4**

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. **C/VSE**

10. **High Lvl Ass. VSE & VM/ESA®**

11. **WebSphere MQSERIES® VSE/ESA**

12. **DITTO/ESA® for VSE**

13. **IBM DFSORT /VSE® V3**

14. **Encryption Facility for z/VSE**

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

MWLC Sample Stack Slope vs. TWLC and FWLC
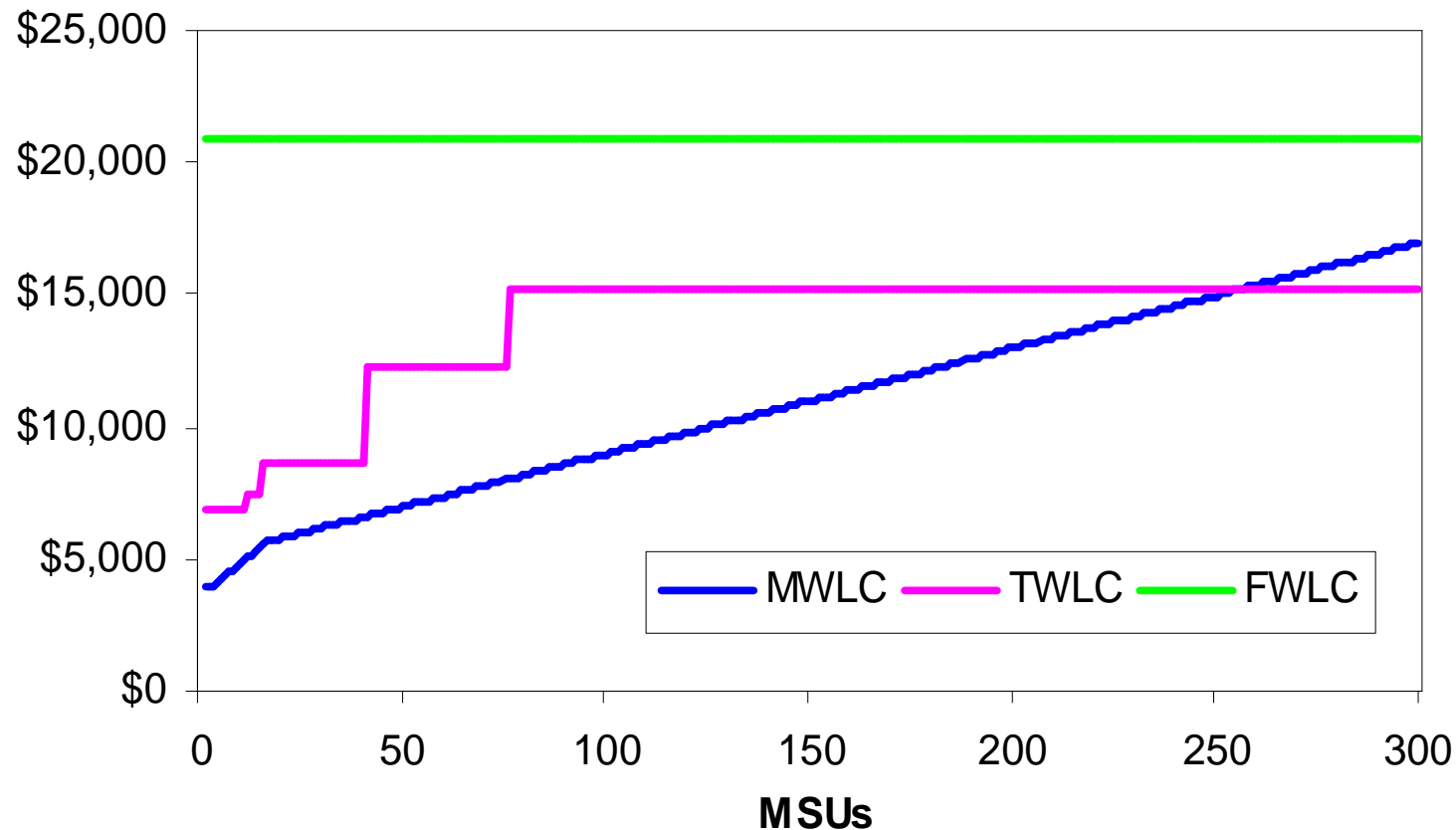
§ **Customers may choose between MWLC/TWLC or MWLC/FWLC as appropriate to their machine.**

§ **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

Agenda

§ **Midrange Workload License Charge (MWLC)**

§ **Sub-Capacity Pricing Option**

§ **Implementation Details**
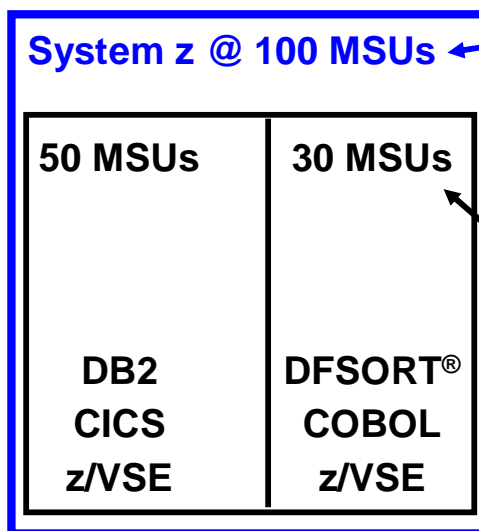
§ **Enhancements 2009**

§ **Summary**

zEG04 z/VSE Software Pricing

What is Sub-Capacity?

sub- (prefix)

Below; under; beneath: *subsoil.*

Subdivision: *subregion.*

Less than completely **or normally; nearly.**

System z @ 100 MSUs

50 MSUs	30 MSUs
DB2 CICS z/VSE	DFSORT® COBOL z/VSE

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

Example: zELC, TWLC

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

Example: EWLC, MWLC

IBM

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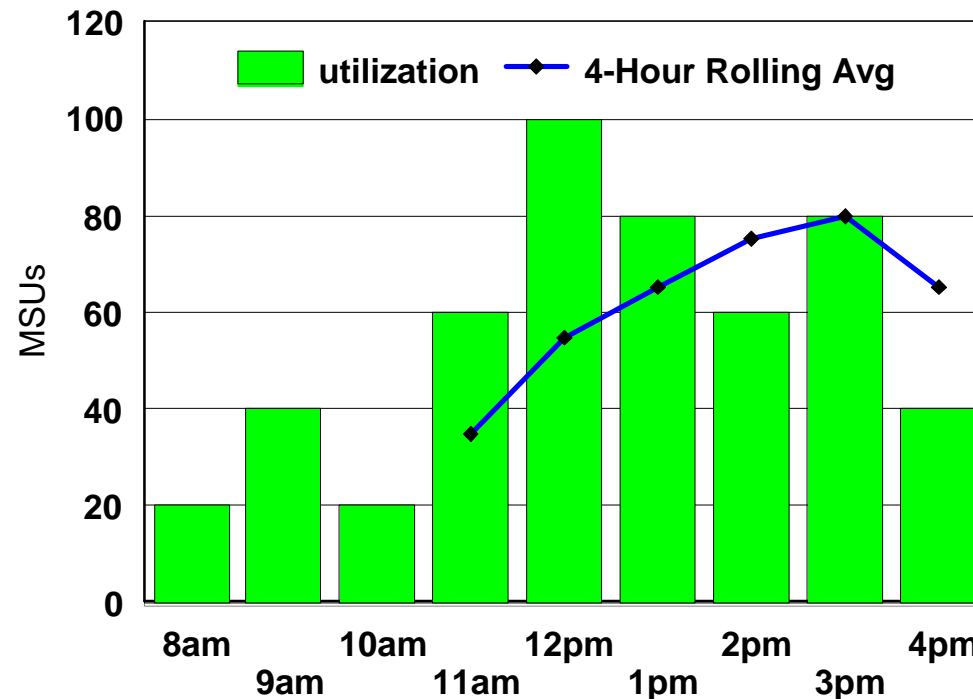
11 am (8,9,10,11):   35 MSUs

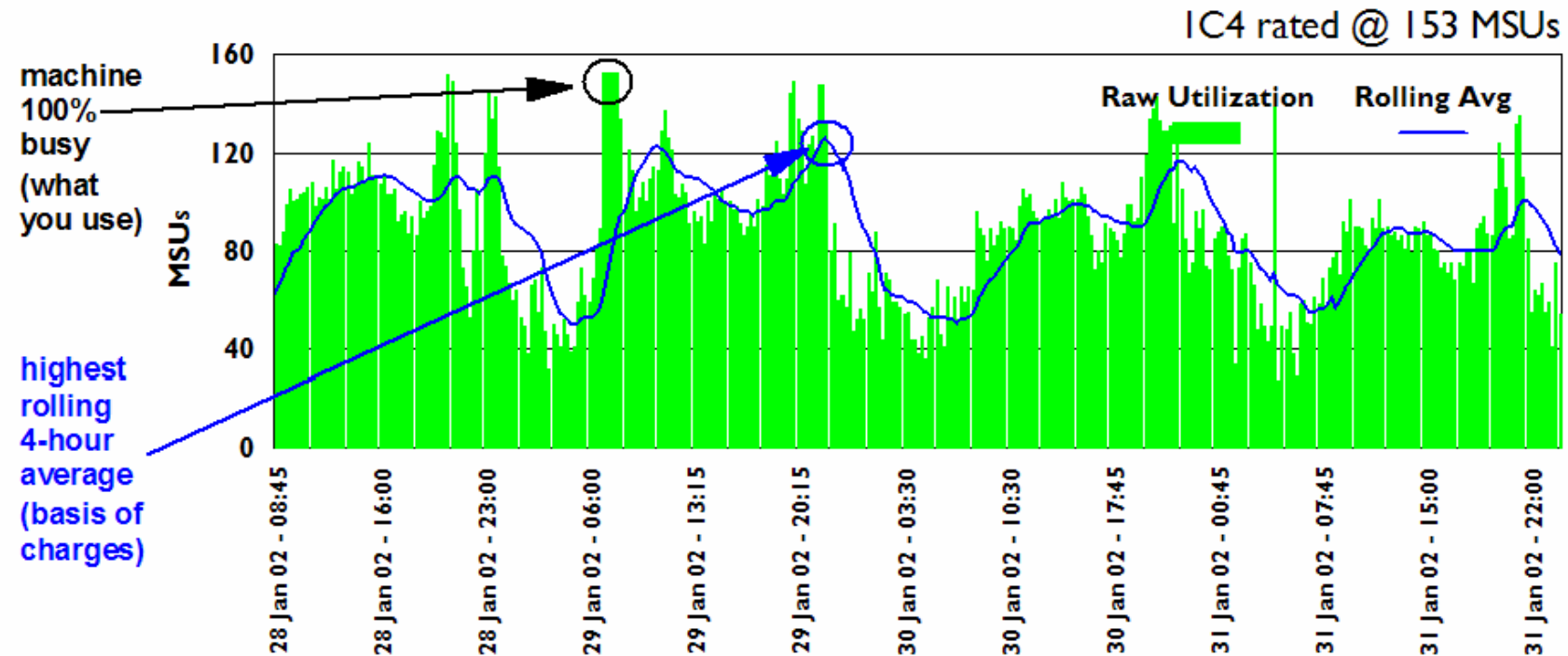12 pm (9,10,11,12): 55 MSUs

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

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

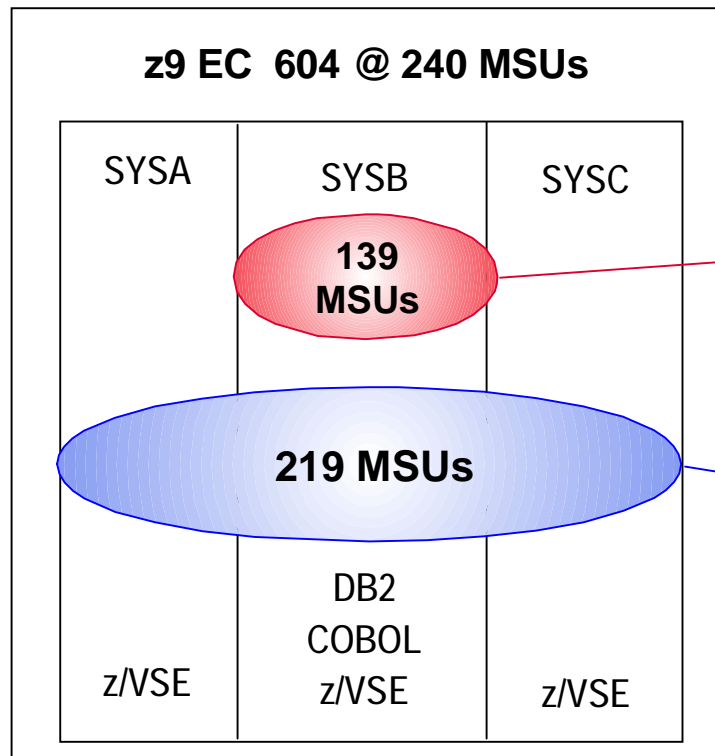3 pm (12, 1, 2, 3): 80 MSUs

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

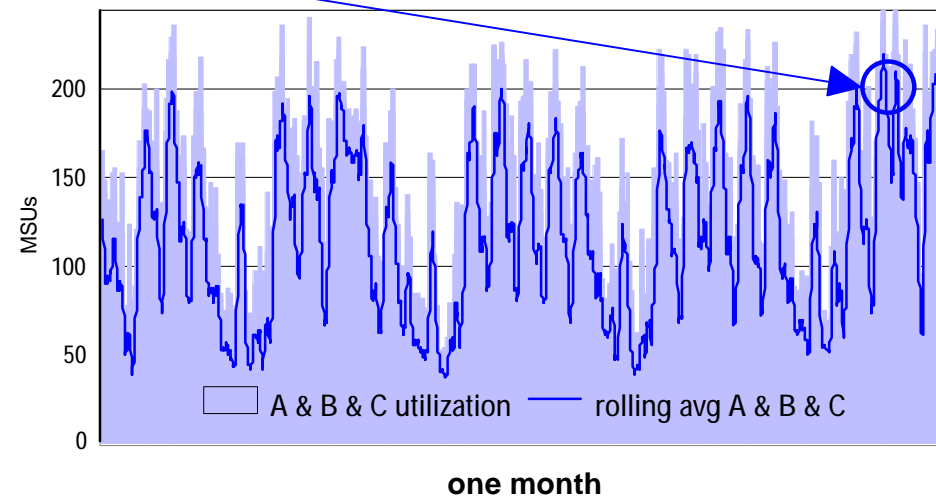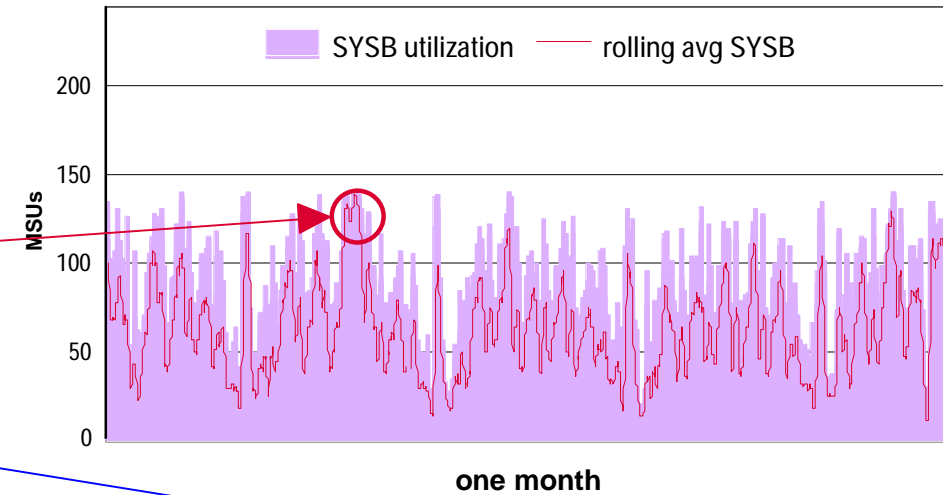# Example: Peak Rolling 4-Hour Average

Rolling 4-Hour Average utilization smoothes out peaks in raw utilization.
Allows for varied peaks & bases Software charges on more moderate measure.

Generic Sub-Capacity Example

z9 EC 604 @ 240 MSUs

	SYSA	SYSB	SYSC

139 MSUs

219 MSUs

DB2 COBOL z/VSE

z/VSE   z/VSE

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

SYSB utilization — rolling avg SYSB

MSUs

200

150

100

50

0

one month

A & B & C utilization — rolling avg A & B & C

MSUs

200

150

100

50

0

one month

Simultaneous combined rolling 4-Hour Average

Peak LPAR1 = 73

Peak LPAR2 = 52

Combined Peak = 93
(NOT PeakLPAR1 + PeakLPAR2 = 125)

LPAR One

LPAR Two

Combined Util

MSUs

Time =>
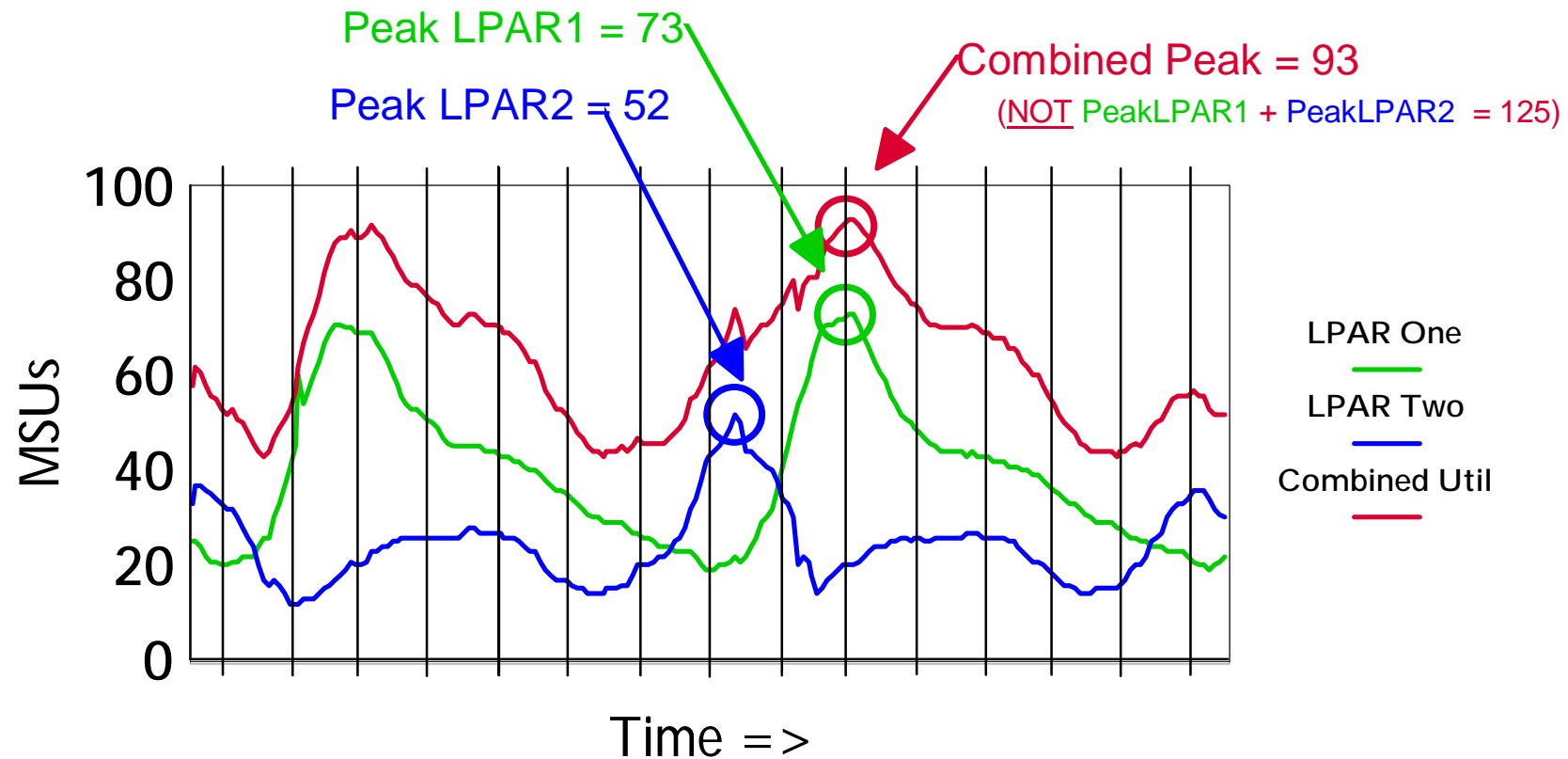
Benefits of Sub-Capacity Pricing

§ **Disconnect HW growth from SW charges for sub-capacity eligible products**
- Allows you to grow hardware capacity independently of software capacity

  e.g. upgrade server and only pay for software based on the utilized portion of the server
- Grow into excess hardware capacity gradually as needed with a 1 MSU level of granularity
- Spike into "spare" capacity without incurring software charges
- Manage utilization without having to turn engines on and off

§ **Grow an LPAR without affecting software in other LPARs**
- Isolate products in certain LPARs to reduce software costs (optional)
- Reduce LPAR utilization to reduce software costs (optional)
- Add capacity to grow your production LPARs without impacting your test and/or development LPARs

§ **Align software charges with utilization**
- Pay based on highest rolling 4-hour average utilization each month, not peak utilization
- Sub-Capacity Monitoring Tool manages measurement and reporting
- Software charges increased/decreased based on variations in utilization

Agenda

§ **Midrange Workload License Charge (MWLC)**

§ **Sub-Capacity Pricing Option**

→ § **Implementation Details**

§ **Enhancements 2009**

§ **Summary**

zEG04 z/VSE Software Pricing

Transition to z/VSE V4 MWLC Pricing

§ **Basic Requirements**
  - **IBM System z10 EC, z10 BC, z9 EC, or z9 BC (exception: capacity setting A01 is priced zELC)**
  - **z/VSE V4**
  - **If running under z/VM: z/VM 5.2 (or higher) is required**

Very simple !

§ **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**

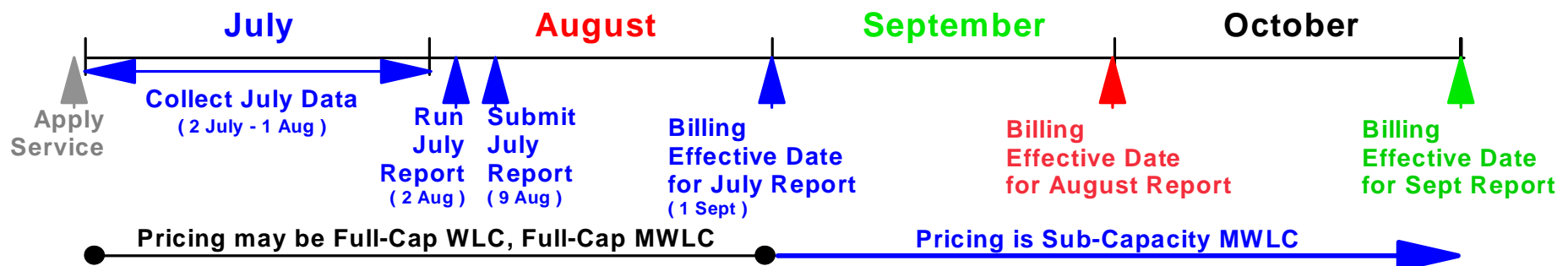# Transition to z/VSE V4 Sub-Capacity Pricing

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

§ **Reporting Requirements**
- Must report on <u>all</u> 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 <u>collection</u> period: 2nd of the previous month - 1st of the current month
- Data <u>submission</u> period: 2nd - 9th following data collection

| July | August | September | October |

Apply Service

Collect July Data
(2 July - 1 Aug)

Run July Report
(2 Aug)

Submit July Report
(9 Aug)

Billing Effective Date for July Report
(1 Sept)

Billing Effective Date for August Report

Billing Effective Date for Sept Report

Pricing may be Full-Cap WLC, Full-Cap MWLC

Pricing is Sub-Capacity MWLC

Capacity Measurement Tool (CMT)

§ **Announced and available with z/VSE V4.1 since March 16, 2007**

§ **Can be activated on z9 and z10 servers only**

§ **Requires z/Architecture mode è z/VSE V4.1 (and later) 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**
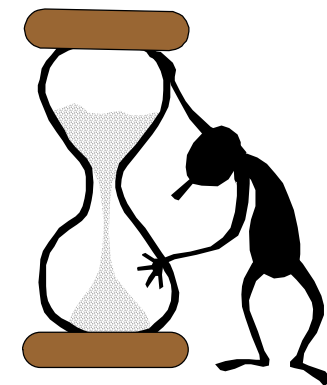
Sub-Capacity Reporting Tool (SCRT)

§ **Announced with preview announcement of z/VSE V4.2 on Oct 9, 2007**

§ **Available with z/VSE V4.1 (and later) since Oct 10, 2007**

§ **Requires SCRT V14.2 (or later) on z/VSE or z/OS**

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

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

§ **Customers must generate their SCRT report on a monthly base**

§ **Customers must send their SCRT report to IBM on a monthly base**

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

SCRT Example Report: Part 1 of 3

=============== SUB-CAPACITY REPORT ==============

Run Date/Time	02 Feb 2007 - 12:38
Name of Person Submitting Report:	xyz
E-Mail Address of Report Submitter:	xyz
Phone Number of Report Submitter:	xxx
Customer Name	xyz
Customer Number	xxx
Machine Serial Number	xxx
Machine Type and Model	2096-G01
Machine Rated Capacity (MSUs)	15
Purchase Order Number	xyz
Is this machine a member of a pricing aggregation?	no
Customer Comments (255 chars max)	xyz

TOOL INFORMATION

Tool Release	12:02
Reporting Period	2 Jan, 2007 - 1 Feb, 2007

SCRT Example Report: Part 2 of 3
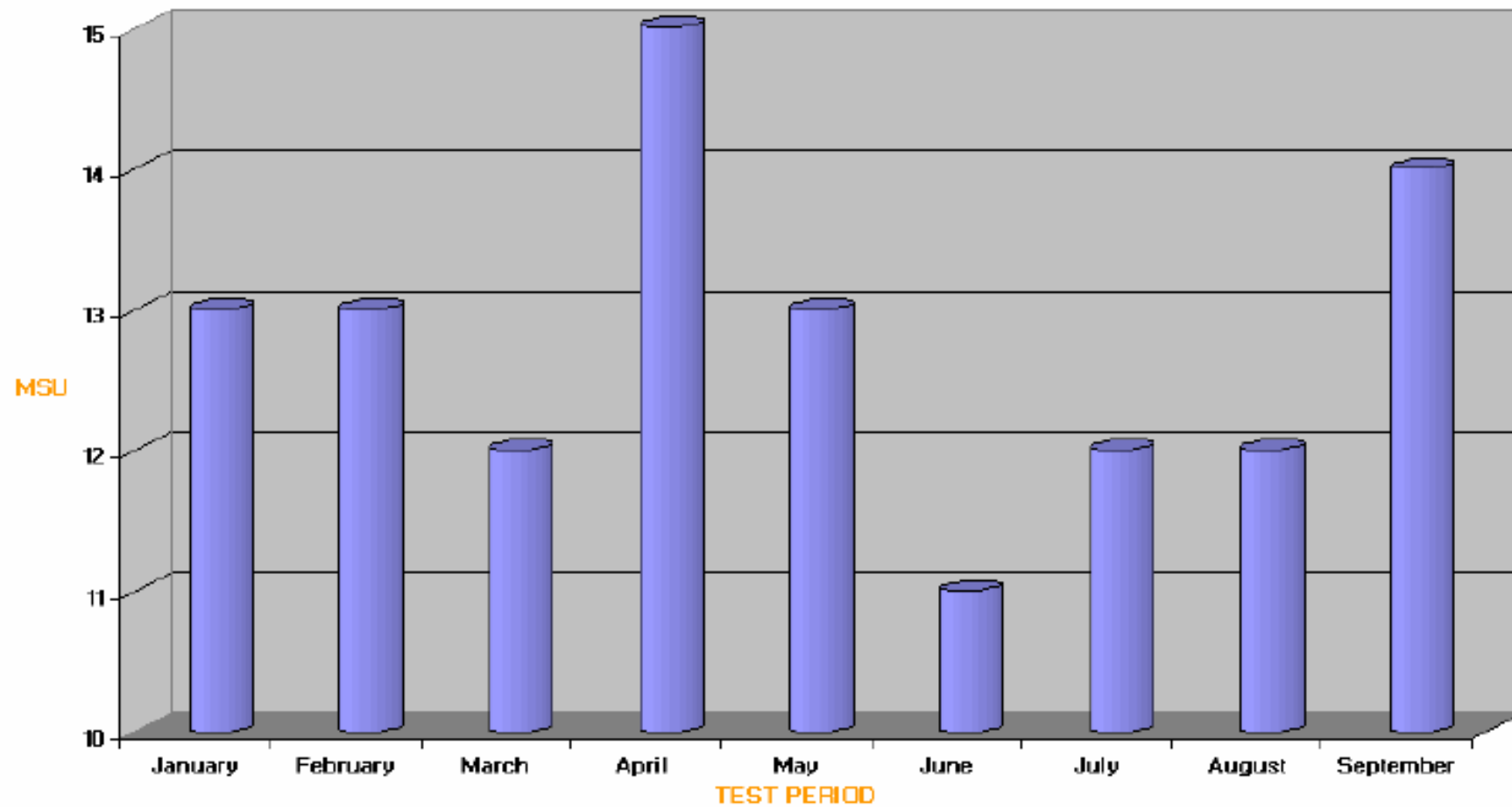
	z/VSE
% Data Collected	96% for 31 days
Justification for low data collection (255 chars max)	explain

PRODUCT SUMMARY INFORMATION

VWLC Product Name	VWLC Product ID	Tool MSUs
VSE Central Functions V8	5686-CF8	13
ACF/VTAM V4 VSE/ESA	5686-065	13
CICS TS for VSE/ESA	5648-054	13
DITTO/ESA for VSE	5648-099	13
High Level Assembler VSE & VM	5696-234	13
IBM COBOL VSE/ESA	5686-068	13
TCP/IP for VSE	5686-A04	13

SCRT Example Report: Part 3 of 3

zEG04 z/VSE Software Pricing

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§ **Summary**

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Enhancements 2009

§ **Soft-Capping of z/VSE CPU usage**

§ **Sub-Capacity Measurement Granularity with z/VSE**

§ **Sub-Capacity Offering with System z10 BC A01**
  – **Specific Terms & Conditions apply**
  – **Ask your IBM sales rep or IBM Business Partner**

# PI CAP CPU – www.picapcpu.de

Tool from PI-Sysprog (Martin Truebner)

§ Provides soft-capping of z/VSE CPUs
- Works for both, z/VSE in the LPAR or z/VM guest
- Measures CPU load based on z/VSE Turbo Dispatcher data, and triggers actions
- Allows to control CPU load based on Turbo Dispatcher data, e.g. avoid peaks, detect loops, etc.
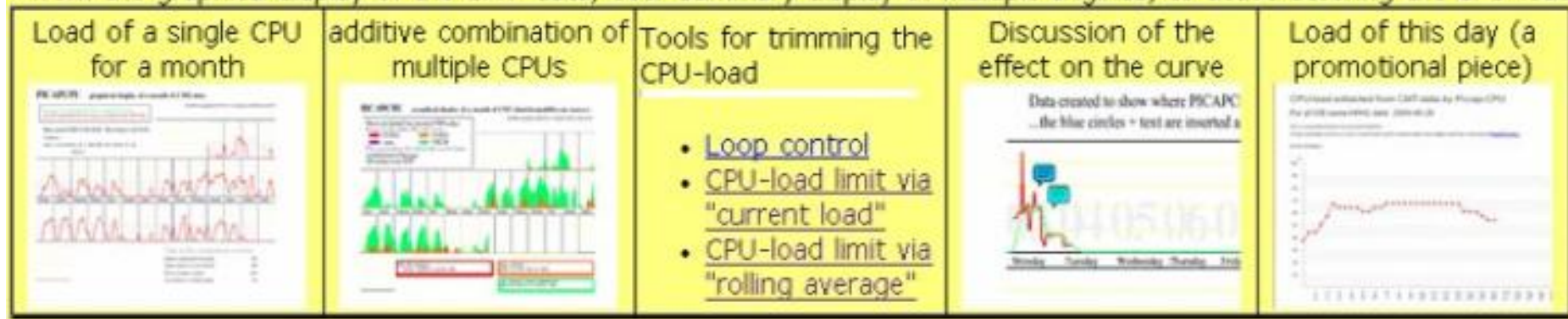
§ Graphical display of CMT / SCRT data and z/VSE Turbo Dispatcher data
- Exit for customization

§ Almost all code written in VSE/REXX
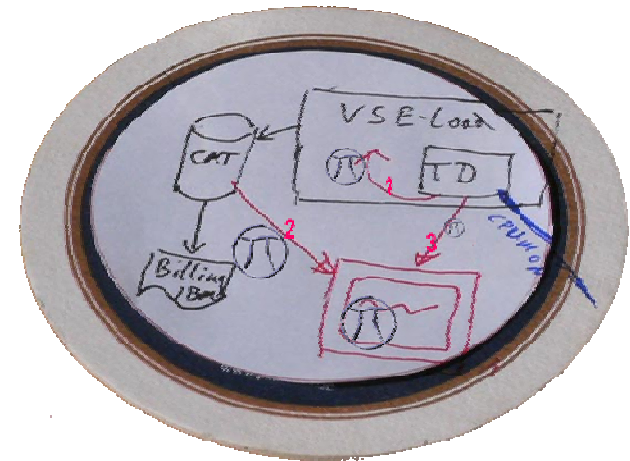
- from the graphical display of the CMT-data, over summary display of multiple engines, to active steering the CPU-load.

Load of a single CPU for a month	additive combination of multiple CPUs	Tools for trimming the CPU-load	Discussion of the effect on the curve	Load of this day (a promotional piece)
		• Loop control • CPU-load limit via "current load" • CPU-load limit via "rolling average"	Data created to show where PICAPC ...the blue circles + text are inserted a	CPU-load extracted from CMT data by Picap CPU

z/VSE Sub-Capacity Measurement Granularity

§ **Problem: z/VM guest systems may cause to over report the customer's MSU use, e.g.**
  - Customer has an LPAR running a z/VM system with 6 z/VSE guests
  - Each z/VSE guest will report a minimum of 1 MSU for each guest system (as designed), regardless, if less than 1 MSU is used
  - As a result, SCRT will report a minimum of 6 MSUs, even though the actual usage might have been less
  - This problem gets even more obvious if customer puts a hard-cap on the LPAR
  - The problem may also occur for z/VSE systems running in a number of LPARs with some of the z/VSE systems only idling

§ **Requirement: Allow subcap measurement granularity of less than 1.0 MSU**
  - Requires code changes in SCRT and in z/VSE

§ **Solution: SCRT V18.1 & z/VSE V4.2 allow MSU measures of less than 1.0**
  - Planned availability in 4Q09

1 MSU (= minimum measured subcap granularity per z/VSE system)

z/VSE 1 0.75 MSU	z/VSE 2 0.5 MSU	z/VSE 3 0.5 MSU	z/VSE 4 0.75 MSU	z/VSE 5 0.75 MSU	z/VSE 6 0.75 MSU
z/VM / LPAR

Used 4 MSUs

Reported 6 MSUs
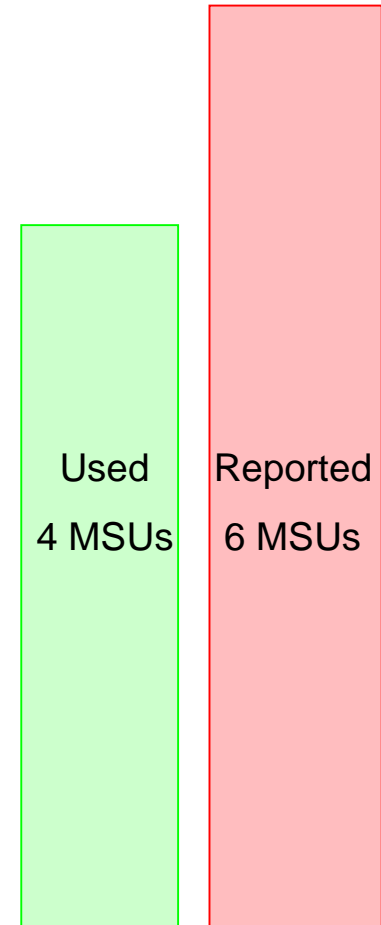
Sub-Capacity Offering with z10 BC A01

§ **Sub-Capacity Offering with System z10 BC A01**
   – **Specific Terms & Conditions apply**
   – **Ask your IBM sales rep or IBM Business Partner**

Agenda

§ **Midrange Workload License Charge (MWLC)**

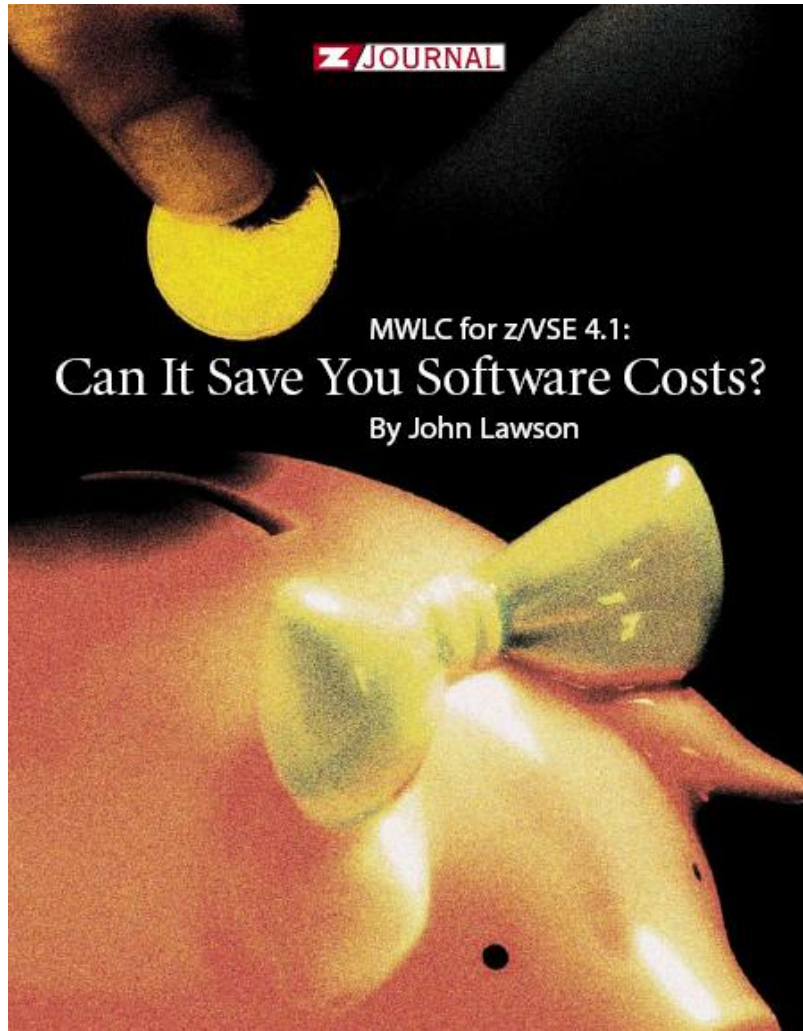§ **Sub-Capacity Pricing Option**

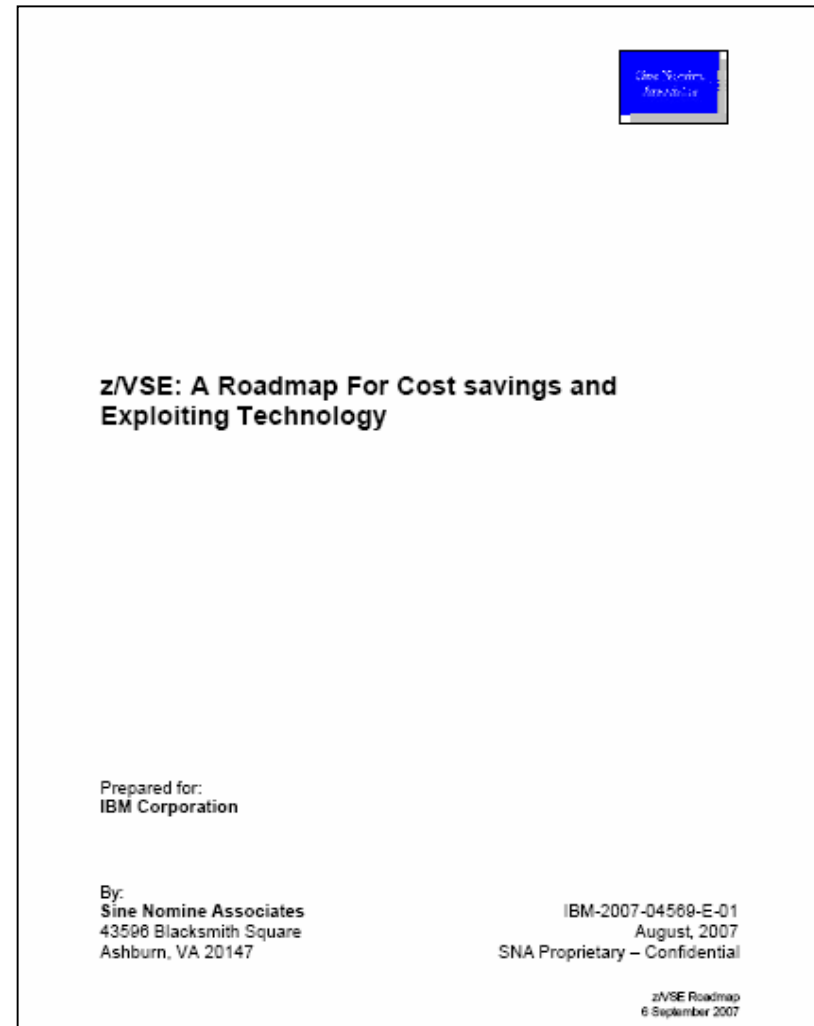§ **Implementation Details**

§ **Enhancements 2009**

§ **Summary**

zEG04 z/VSE Software Pricing

Press and Analyst Articles

Source: z/Journal, April / May 2007

Source: Sine Nomine Associates, August 2007

zEG04 z/VSE Software Pricing

z/VSE – Price/Performance over Time

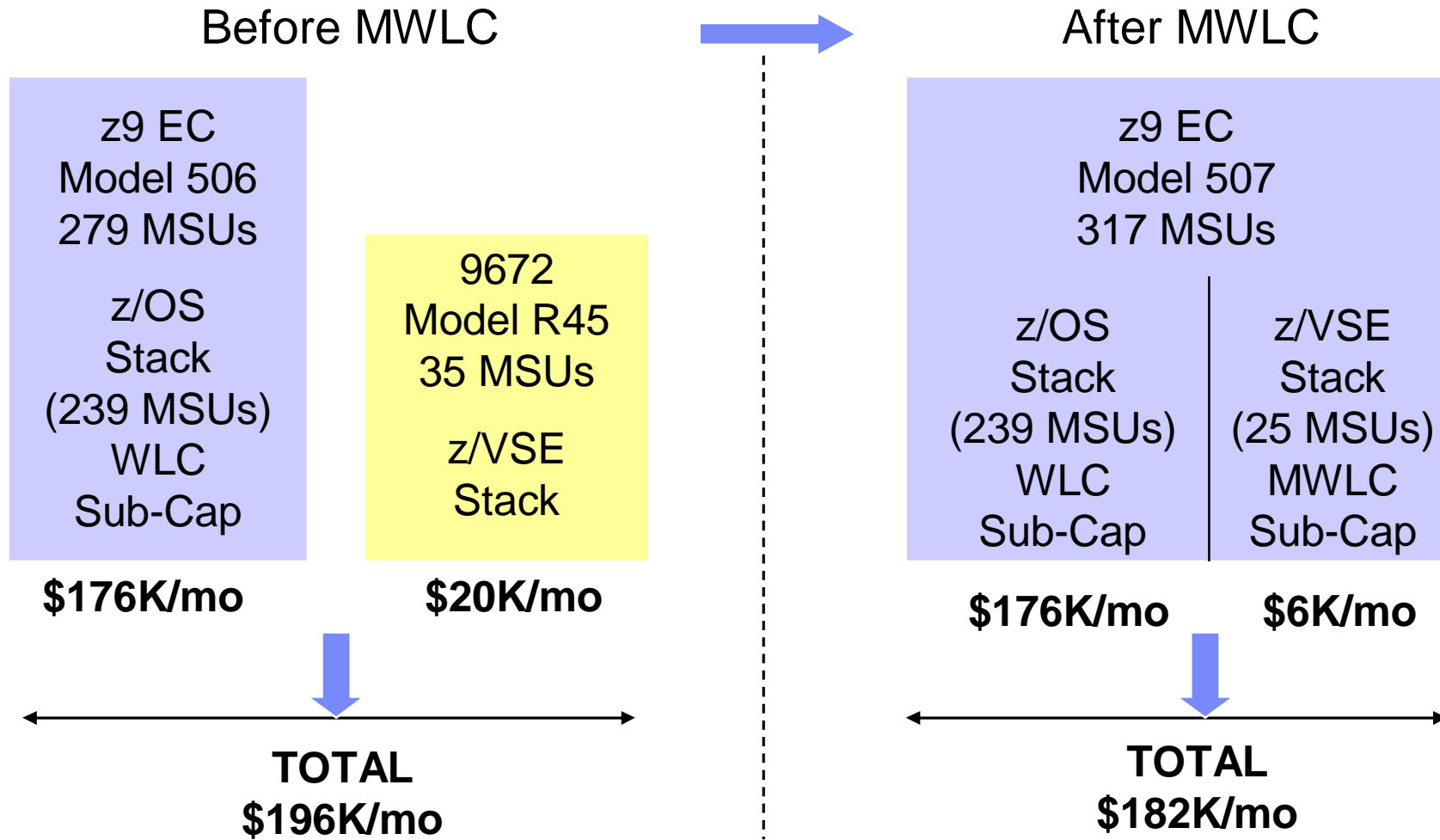| 32 MSUs z/VSE Stack 9672 GMLC	32 MSUs z/VSE Stack z800 zELC	32 MSUs z/VSE Stack z890 TWLC	32 MSUs z/VSE V4 Stack z9 BC MWLC	32 MSU z/VSE V4 Stack z9 BC MWLC with 30% White Space
$240K/yr	$120K/yr	$96K/yr	$76K/yr	$71K/yr
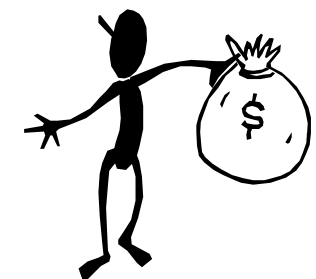
§ *"I just got our April software bill from IBM for the first month on our z9 under z/VSE 4.1 and MWLC. We were paying $22,965 per month on our z800 under z/VSE 3.1.2. The April bill is for the same software and it is $12,318: a difference of $10,647 per month."* **Mike Moore, IT Manager, Alabama Judical Datacenter, Alabama**

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

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

z/VSE V4: MWLC High-End Price/Performance Server Consolidation Example

Before MWLC → **After MWLC**

z9 EC
Model 506
279 MSUs

z/OS
Stack
(239 MSUs)
WLC
Sub-Cap

$176K/mo

9672
Model R45
35 MSUs

z/VSE
Stack

$20K/mo

z9 EC
Model 507
317 MSUs

z/OS
Stack
(239 MSUs)
WLC
Sub-Cap

z/VSE
Stack
(25 MSUs)
MWLC
Sub-Cap

$176K/mo   **$6K/mo**

**TOTAL
$196K/mo**

**TOTAL
$182K/mo**

*Sample software stack includes: VSE CF V8, HLASM, VTAM, DITTO, COBOL
*Prices subject to change without notice; all prices shown in USD

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**