IBM STG Technical Conference

More Flexibility with New Software Pricing for z/VSE V4

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Agenda

- Top Concerns of VSE Customers
- Midrange Workload License Charge (MWLC)
- Sub-Capacity Pricing Option
- Implementation Details
- Some Examples
- Summary

Top Five Concerns of VSE* Customers

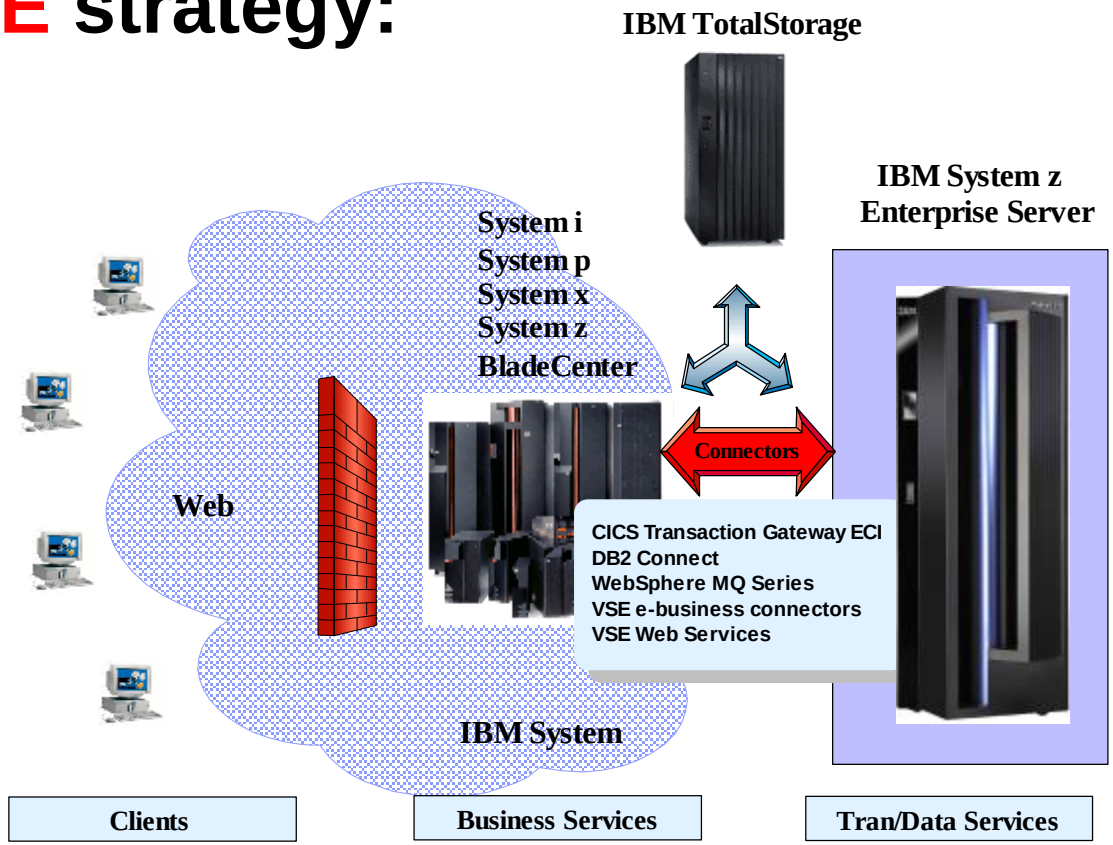
1. **Cost**
2. **Cost**
3. **Cost**
4. **Applications**
5. **Applications**

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

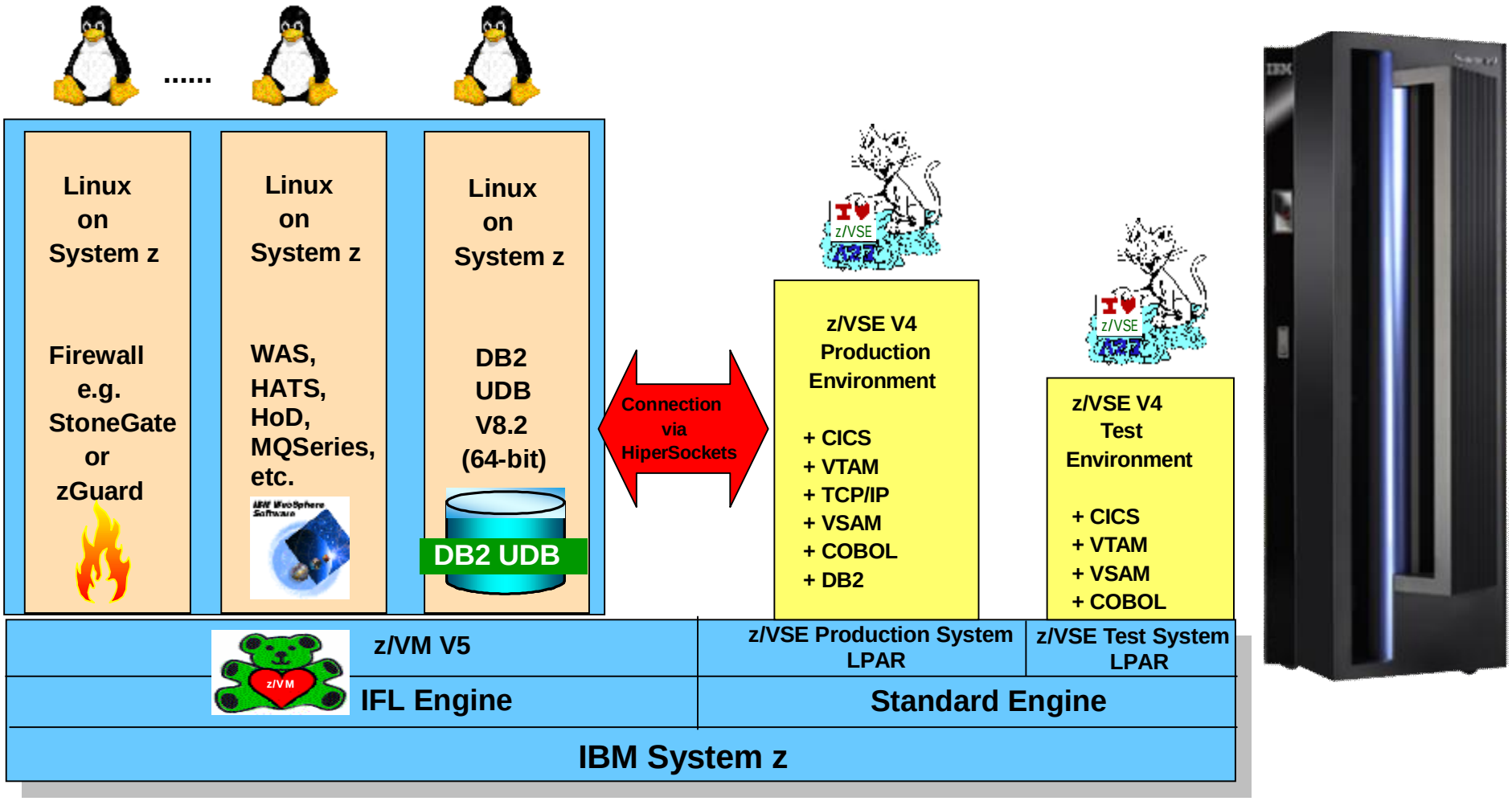
How to address the Application Issue ?

Access to new applications is addressed through VSE's PIE strategy:

- **P**rotect
- **I**ntegrate
- **E**xtend



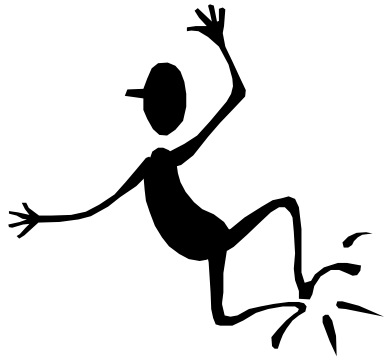
Access to new Applications with Linux on System z



How to address the Cost Issue ?

Cost is addressed with this presentation:

- **Midrange Workload License Charge (MWLC)**
- **Sub-Capacity Pricing Option**



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History: z/VSE V4 Statement of Direction

Statement of Direction announced as part of IBM System z9 announcement, July 2005:
"IBM intends to provide a software sub-capacity measurement tool for z/VSE."

§ **Fulfilled** with z/VSE V4 Preview Announcement, April 2006:
– **LPAR based sub-capacity monitoring tool**

§ New **Statement of Direction**, announced with z/VSE V4 Preview Announcement:

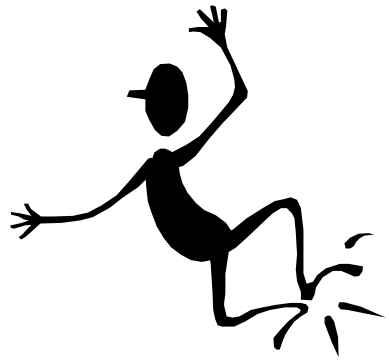
SOD: It is IBM's intent to provide new software pricing for z/VSE V4 when running on select processors, subject to applicable terms and conditions. IBM expects this new software pricing metric to provide more granularity and a sub-capacity pricing option.

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

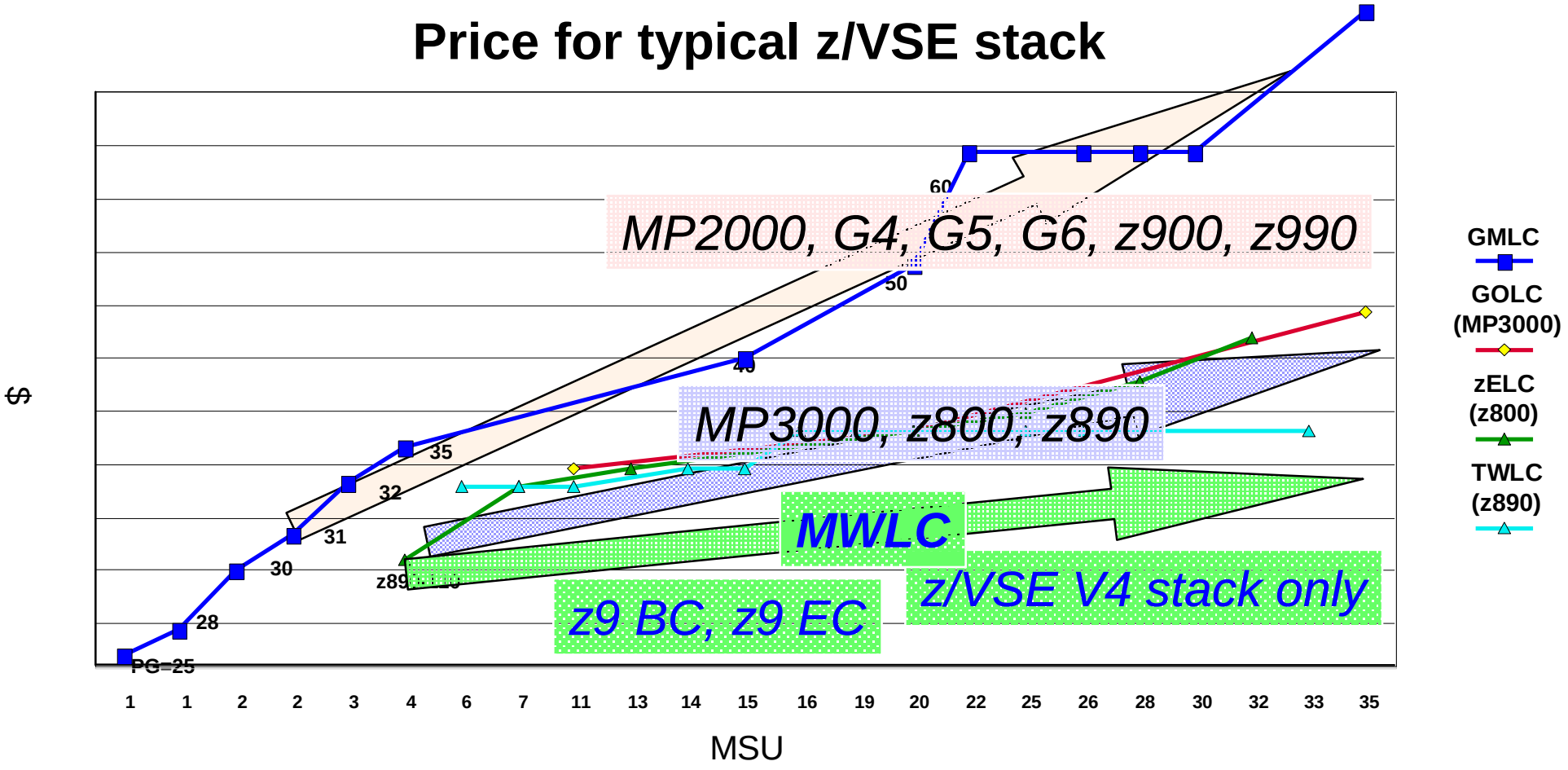
§ **Fulfilled** with z/VSE V4 Product Announcement, Jan 2007:
– **MWLC incl. sub-capacity pricing option**

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**
- **Announced: January 9, 2007**
- **Planned availability: March 16, 2007**



What does MWLC do to Price/Performance ?



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

Summary of z/VSE Software Price Metrics

IBM Servers	z/VSE V4	z/VSE V3 (Note 1)	VSE/ESA V2
IBM System z9 Enterprise Class – z9 EC (formerly z9-109)	**MWLC** (may be flat WLC)	GMLC, ELC, flat WLC	GMLC, ELC, flat WLC
IBM System z9 Business Class – z9 BC	**MWLC** (A01 is zELC)	TWLC (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	GMLC, ELC, flat WLC	GMLC, ELC, flat WLC
S/390® Multiprise® 3000	not applicable	GOLC	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.

Midrange Workload License Charges for z9 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 and z9 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 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

* The z9 BC Model A01 is not eligible for MWLC, it is priced using zELC.
** z9 EC models do not use the TWLC price structure, 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

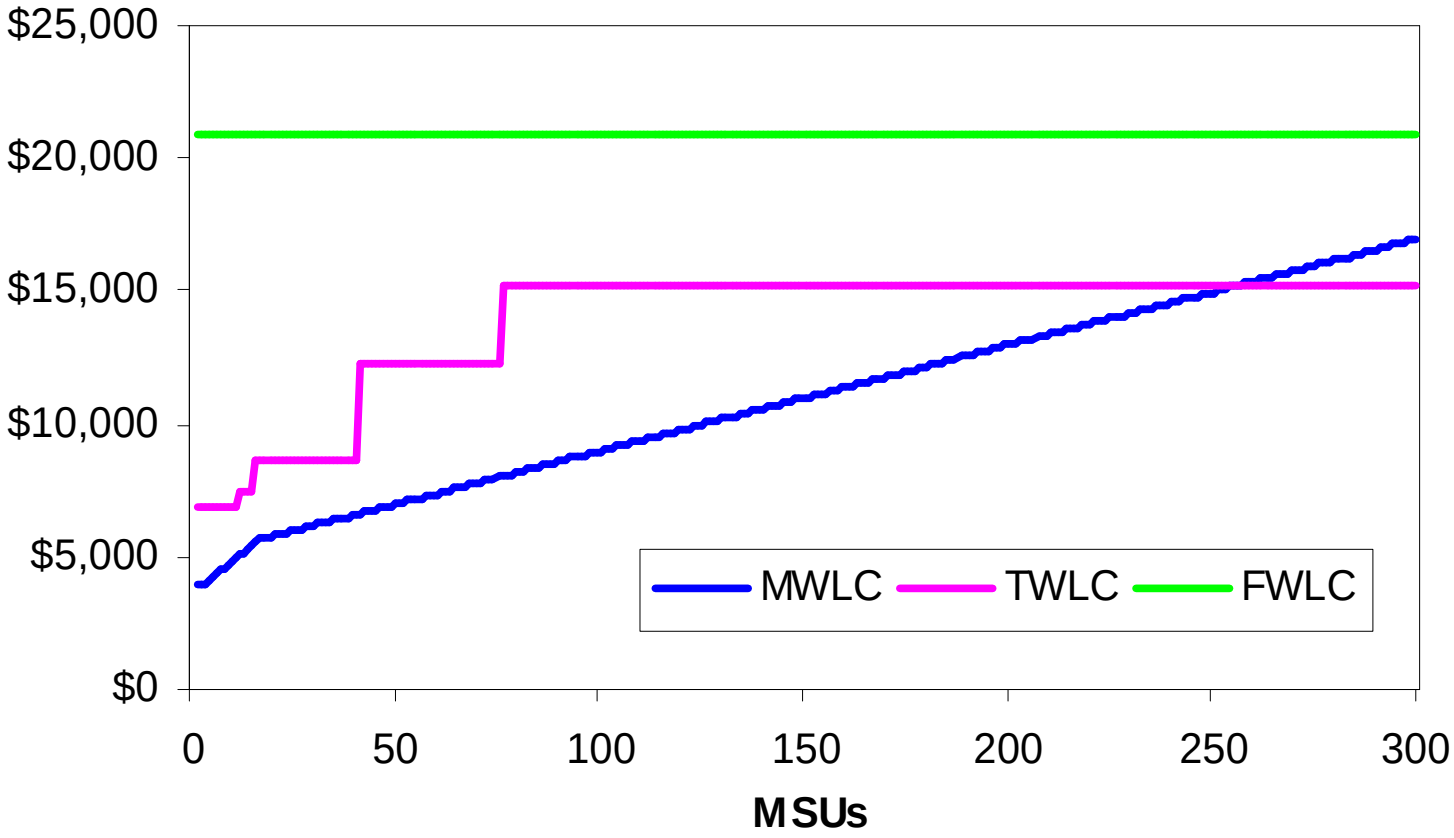
Examples:

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.

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

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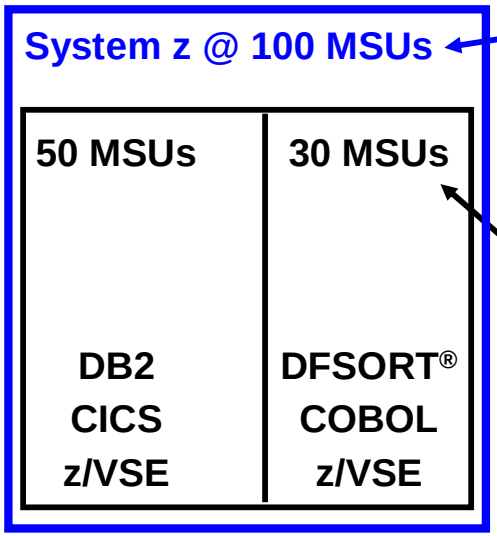
What is Sub-Capacity?

sub- (prefix)
Below; under; beneath: *subsoil.*

Subdivision: *subregion.*
Less than completely or normally; nearly.



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

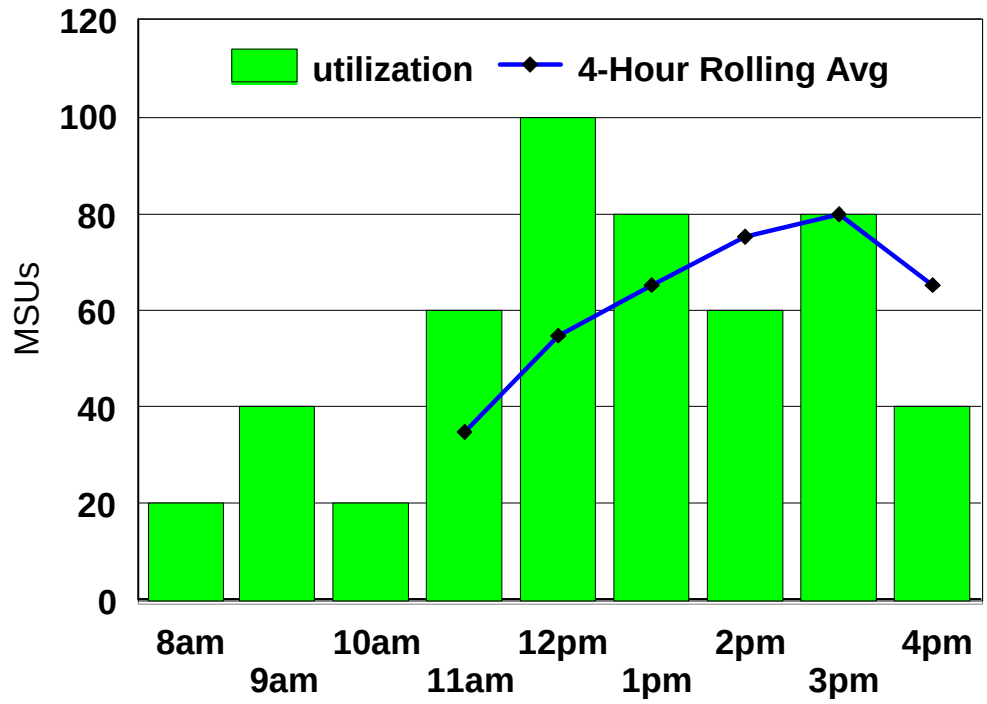
Example: zELC, TWLC

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

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

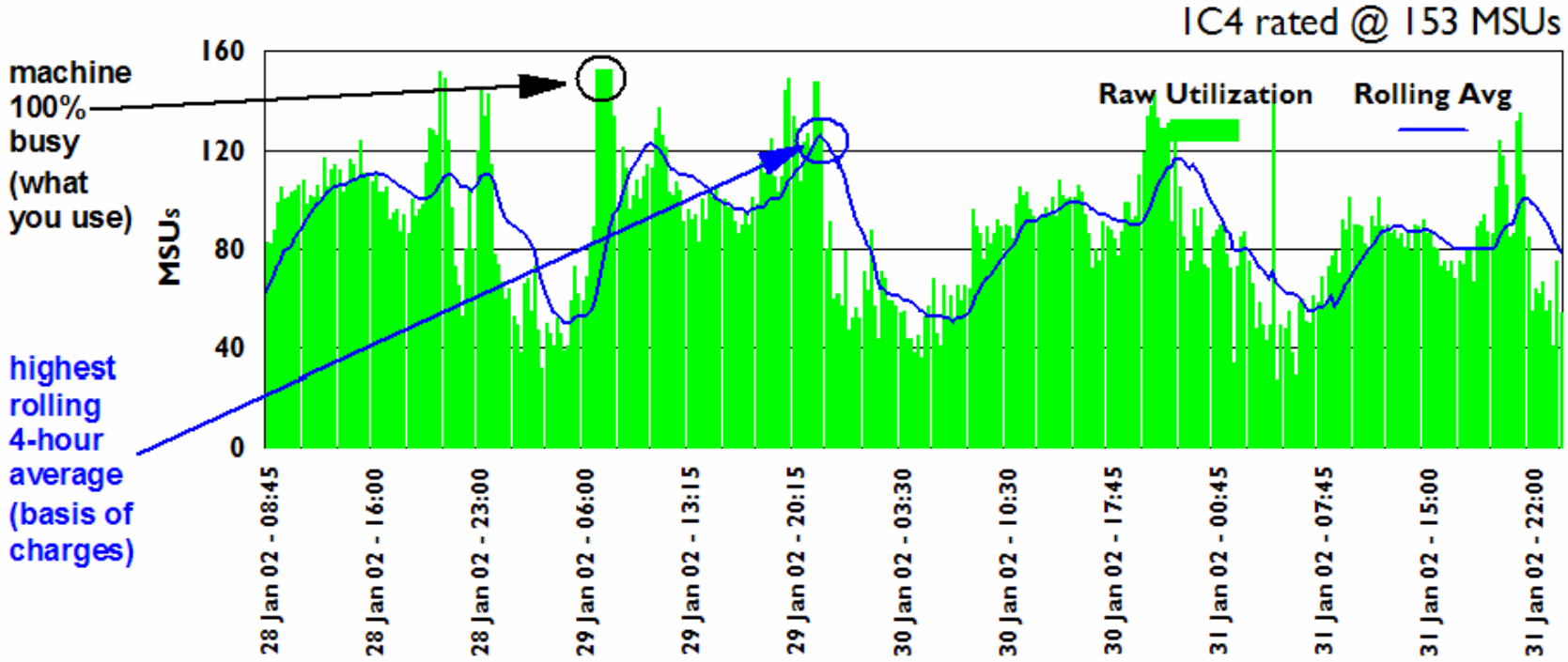
1 pm (10,11,12,1): 65 MSUs

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

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

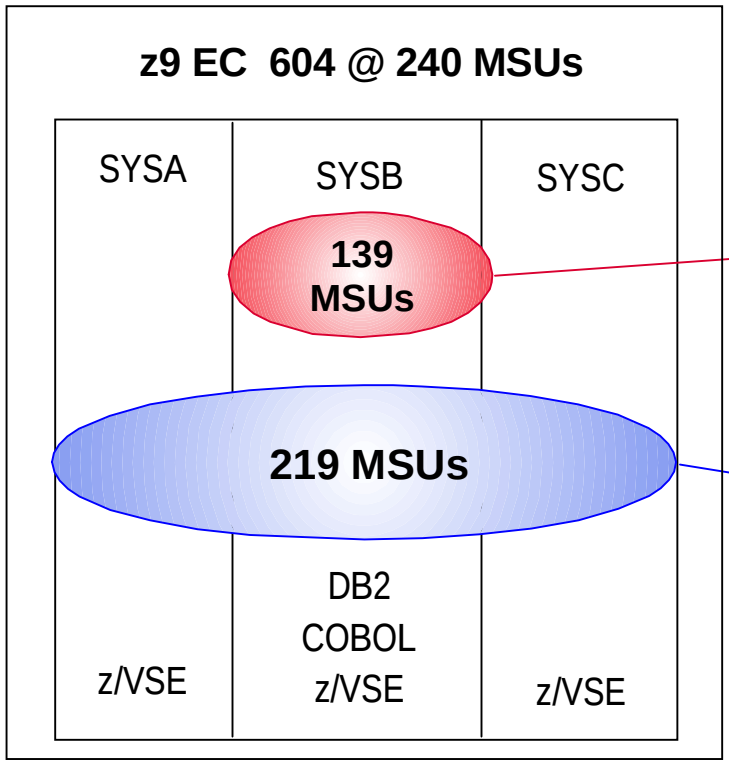
4 pm (1, 2, 3, 4): 65 MSUs

Example: Peak Rolling 4-Hour Average

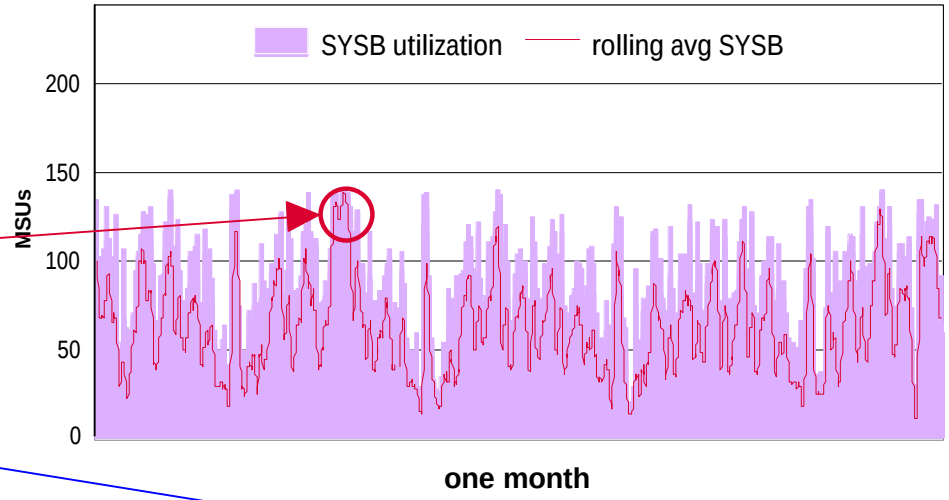


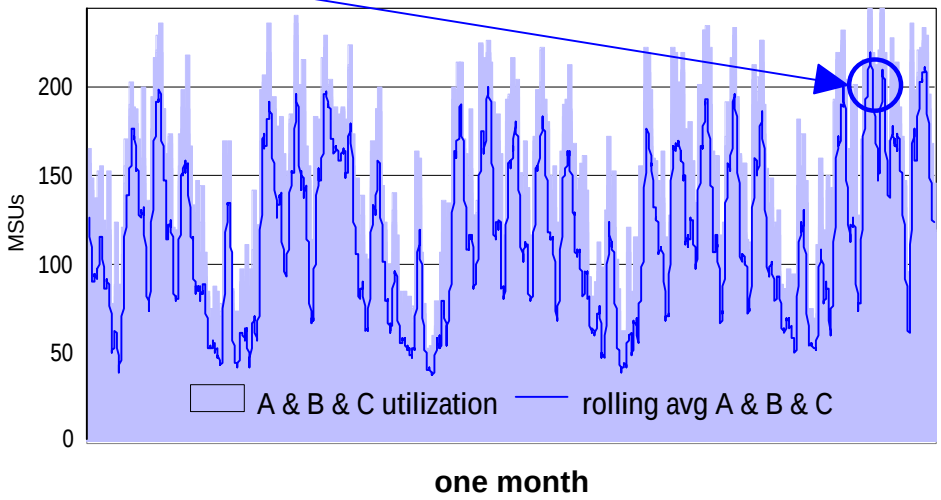
Rolling 4-Hour Average utilization smoothes out peaks in raw utilization.
Allows for varied peaks & bases Software charges on more moderate measure.

Generic Sub-Capacity Example



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





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

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

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

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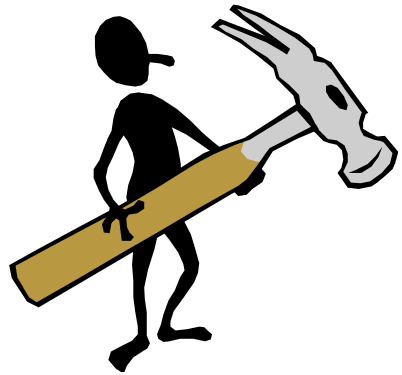
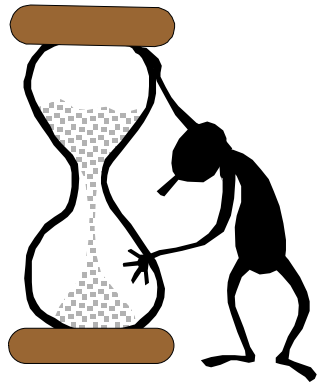
New Tools

- Capacity Measurement Tool (CMT)
- Sub-Capacity Reporting Tool (SCRT)

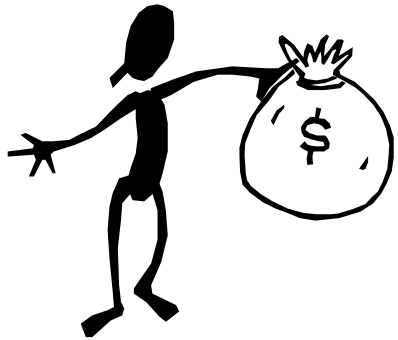


Capacity Measurement Tool (CMT)

- Sometimes called “Sub-capacity Monitoring Tool”
- Announced and planned to be available with z/VSE V4.1 in 3/2007
- Can be activated on z9 BC and z9 EC models only
- Requires z/Architecture mode è z/VSE V4.1 only
- Collects data for LPARs and/or guest machines running under z/VM 5.2 (or later)
- Implemented as a new z/VSE V4.1 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)



- Not announced and not available on z/VSE
- Requires z/OS system to execute, and requires a new version of SCRT
- New version of SCRT on z/OS is planned to become available in 4/2007
- Analyzes SCRT89 records as produced by CMT on z/VSE V4
- Also analyzes SMF70 and SMF89 records as produced by z/OS
- If there is both, z/OS and z/VSE V4, you must generate your own SCRT report
- If there is only z/VSE V4, you will need to send SCRT89 records to IBM and IBM will run SCRT for you
- Output from SCRT is a report, similar to a spreadsheet report

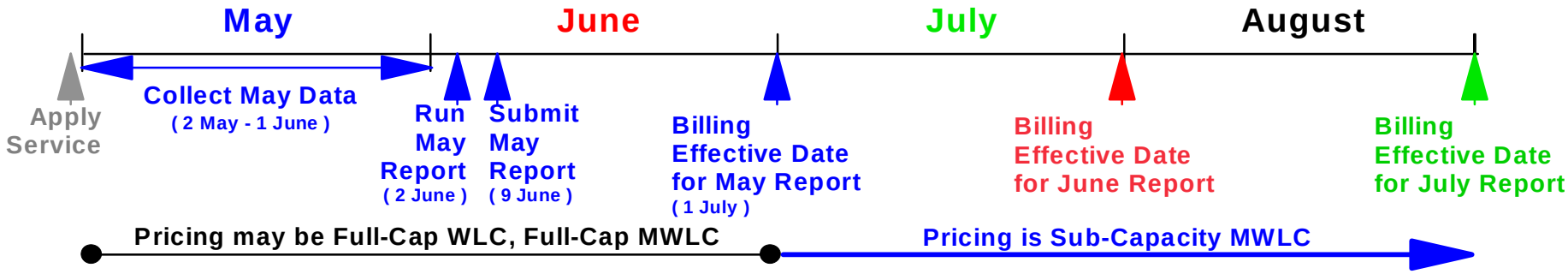
Transition to Sub-Capacity Pricing

§ Basic Requirements

- IBM System z9 BC or z9 EC
- z/VSE V4 (no older VSE version allowed on the processor, ie. no VSE/ESA V2, no z/VSE V3)
- If running under VM: z/VM 5.2 (or later) is required
- If running z/OS on the same processor: no OS/390 LPARs allowed

§ 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



§ 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

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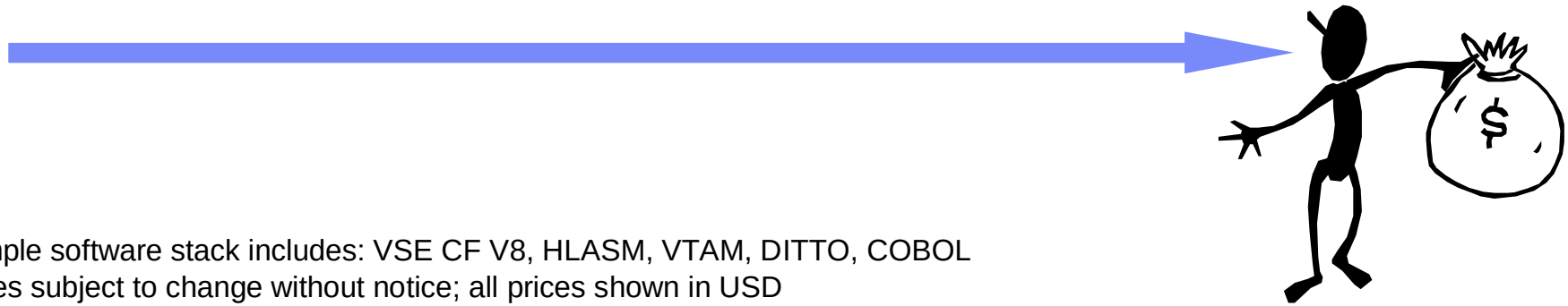
z/VSE – Price/Performance over Time

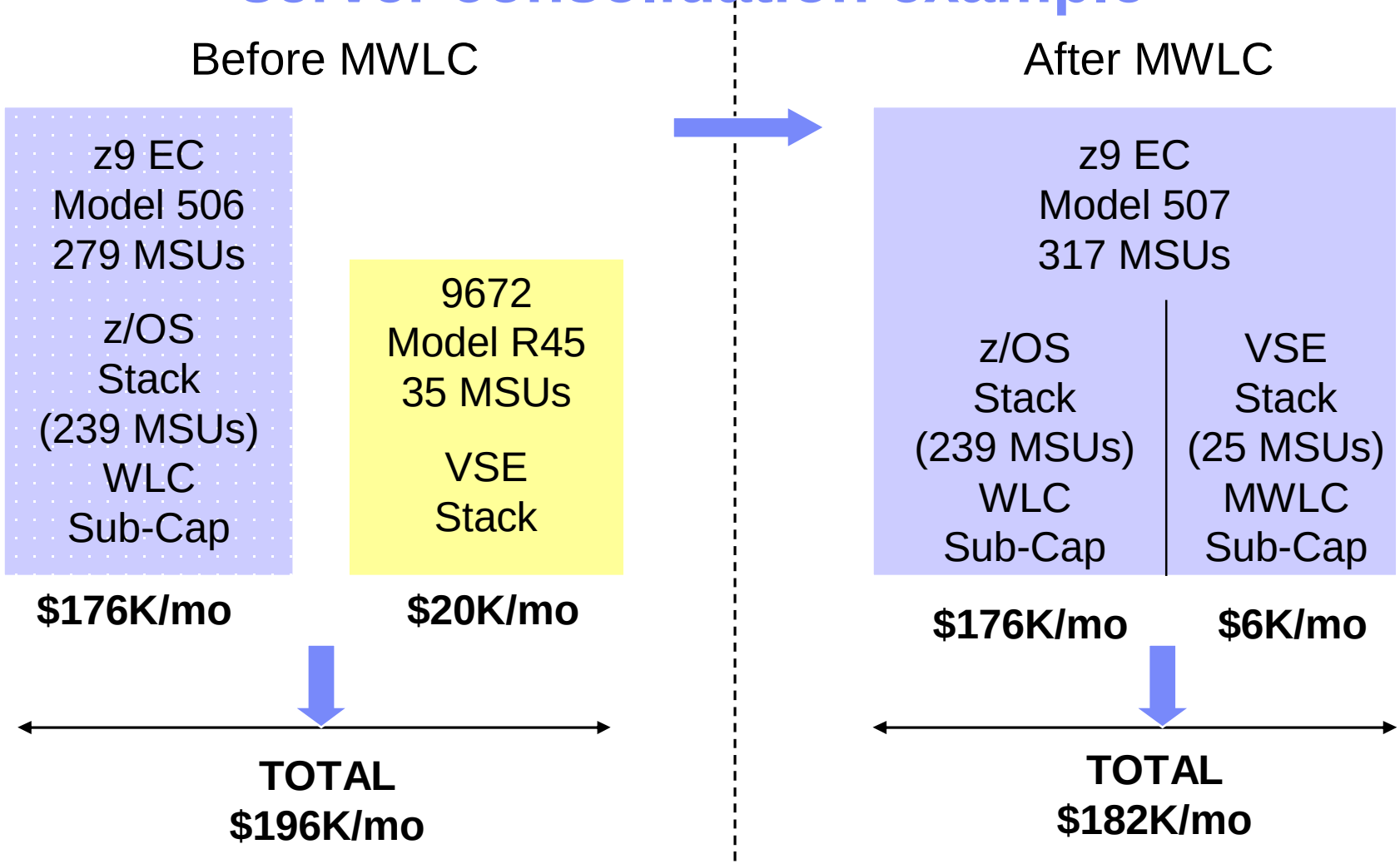
- **Midrange sample customer software stack**

32 MSUs VSE Stack 9672 GMLC	32 MSUs VSE Stack z800 zELC	32 MSUs VSE Stack z890 TWLC	32 MSUs VSE 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



*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



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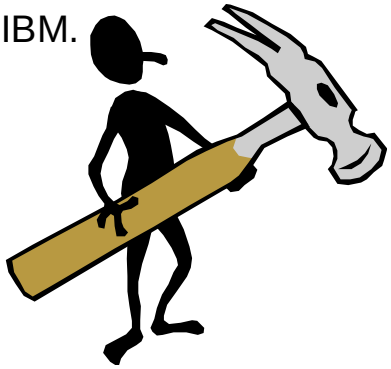
MWLC Requirements

§ For both, full-capacity and sub-capacity MWLC:

- z9 BC or z9 EC
- z/VSE V4
- Attachments:
  IBM System z Midrange Workload License Charges (Z125-7452).
  IBM System z Midrange Workload License Charges Exhibit (Z125-7453).
- Please note, if z/VSE V4 under MWLC is to run as a guest under z/VM, then it must be z/VM 5.2 or later.

§ Additional requirements for sub-capacity MWLC:

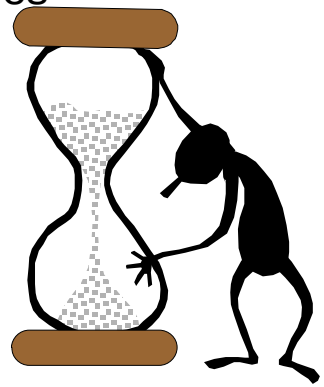
- You must run the Capacity Measurement Tool (ships with z/VSE V4 and enables z/VSE V4 to generate SCRT89 records) for an entire month to generate SCRT89 records
- If you have z/OS, run SCRT* under z/OS.
- If you do not have z/OS, send SCRT89 records (and other required information) to IBM. IBM will use your SCRT89 records to produce a Sub-Capacity Report.
- SCRT report will be returned to you for verification.
- You must submit report to IBM billing via internet tool.



* This assumes a new version of SCRT is generally available at this time.

Key Dates for MWLC

- **March 16, 2007** – General Availability
- **April 1, 2007** – Earliest possible billing date for full capacity MWLC charges
- **April 2, 2007** – Earliest possible date to begin collecting sub-capacity data
- **May 2, 2007** –
  - Earliest possible date to generate SCRT report for z/VSE V4 customers who have z/OS also (to be submitted no later than May 9, 2007)*
  - z/VSE V4 customers who do not also have z/OS will have to send their data to IBM in order to generate an SCRT report
- **June 1, 2007** – Earliest possible billing date for sub-capacity MWLC charges



* This assumes a new version of SCRT is generally available at this time.

New z9 Opportunities possible with MWLC

- **Get more MSUs for 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 ("on demand pricing")
  - Isolate products to reduce software costs (depending on workload)
    - examine workload to identify where you might limit product use to specific LPARs (or z/VM guests)
    - limit LPAR (or z/VM guest) utilization to control software costs (optional)
    - expand production LPARs (or z/VM guests) without impacting other LPARs (or z/VM guests)
  - Add IFL 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

- **Examine server consolidation for large accounts**
  - Consolidate remote, vulnerable VSE workloads onto LPARs on System z9 EC servers, probably running z/OS at headquarter site

Summary: z/VSE V4 and MWLC

- **Helping to protect your investments in core 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 VSE information assets.**
- **Helping improve price / performance.**