Changes in Workload License Charges with z196, z114 and zEC12

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Goals, Plan for the Next 60 Minutes … …

- Very Quick Sub-Capacity Pricing Overview
- z196 Changes (July 22, 2010)
  - No further HW MSU to SW MSU separation on z196s
  - Advanced Workload License Charges (AWLC)
  - Announced in January 2011, Available with Feb 2nd through March 1st data is Integrated Workload License Charges
  - Published 10 February 2011, Available with Feb 2nd through March 1st data is GSSP reduction for DB2 type 2 connections
- z114 Changes (July 12, 2011)
  - No further HW MSU to SW MSU separation on z114s
  - Advanced Entry Workload License Charges
- zEC12 Changes (Aug 28, 2012)
  - No MSU Separation
  - Technology Update Pricing for AWLC
    - Discounts to AWLC Based on Installed MSUs

Workload License Charges

- Over the Last 30+ Years the Correlation Between MIPS and Software Value Has Been Lost

- LPARs Allow for More Granular Capacities

- Software Must be More Granular Also

- So Now IBM Provides LPAR Based Pricing
  - Is LPAR Pricing Fair?
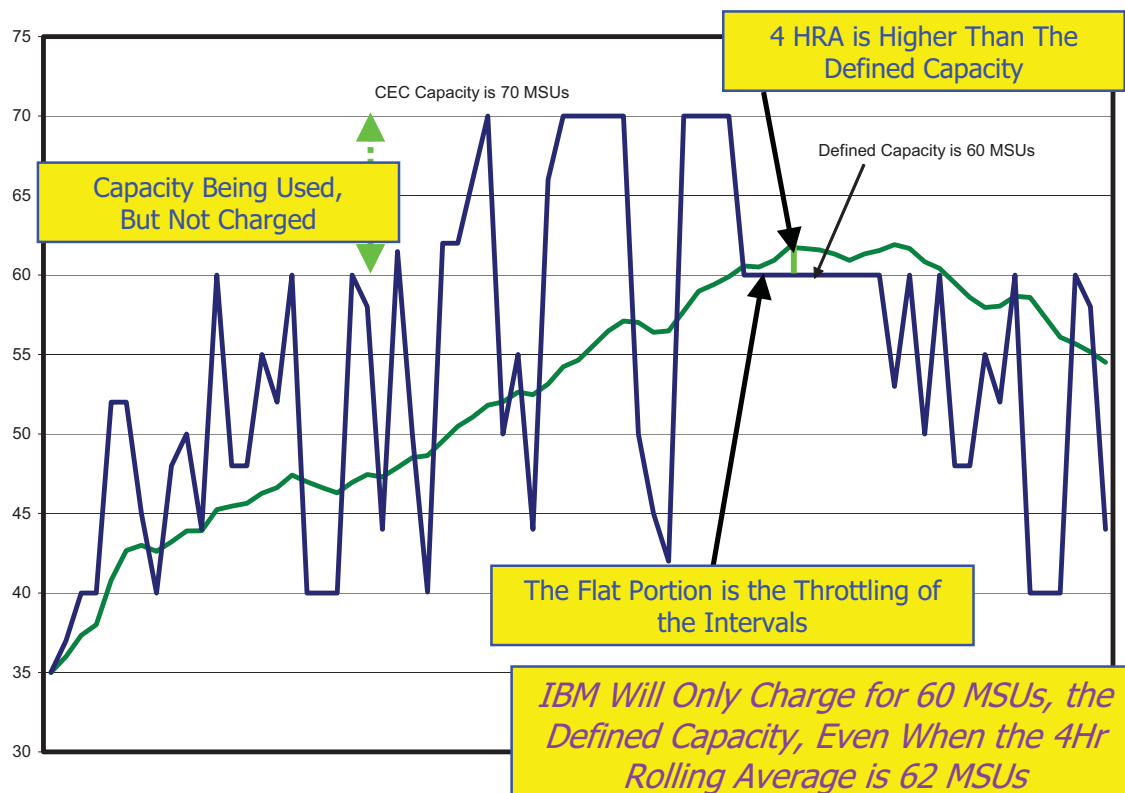 - Perhaps Not, but it is Better than Charging for Software Based on the Whole "Machine"

Workload License Charges

- ## WLC is IBM's Ongoing Attempt to:
  - Remove the SW Cost Obstacle that Holds Back HW Sales
  - Lower Mainframe Total Cost of Ownership
- ## WLC Is Not Static – It is Evolving
- ## IBM Is Now Changing (Enhancing) WLC at Least One Time Per Year
  - July 2010: AWLC for z196 HW
  - January 2011: Integrated Workload Pricing
  - February 2011: Improved GSSP for DB2 Type 2 Connections
  - July 2011: z114s and AEWLC
  - August 2012: Technology Update Pricing for AWLC
- ## WLC Started Simply in October 2000
- ## After 12 Years of Evolution Workload License Charges is Now Quite Complicated!

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zSeries, z/OS and zWorkload zPricing

- ## 14 columns of Machines & Plexes
- ## 18 rows of metrics

	Metric	Description	Sub-Capacity Allowed?	Aggregation Allowed?	9672 & All Others	MP3K	z/800 Standalone	z/800 in a Qualified Sysplex	z/890 Standalone	z/890 in PricingPlex	z/900, z/990, z9-109 in Pricing Plex	z9BC, z10BC Stand-Alone	z9BC, z10BC in Pricing Plex	z9EC, z10EC Stand-Alone	z9EC, z10EC in Pricing Plex	z114 Stand-Alone	z114 in Pricing Plex	z196 Stand-Alone	z196 in Pricing Plex	zEC12 Stand-Alone	zEC12 in Pricing Plex
MLC	GOLC	Growth and Opportunity License Charge - One of oldest models, Operates at a Group Level				Yes																
MLC	FLAT	Much Older Fixed MLC			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	PSLC	Parallel Sysplex License Charge	No	Yes	Yes					Yes	Yes		Yes				Yes	Yes	Yes	Yes	Yes	Yes
MLC	ULC	S/390 Measured Usage License Charge	No	Yes	If PSLC	if GOLC		Part of PSLC Sysplex		Part of PSLC Sysplex	Part of PSLC Sysplex		Part of PSLC Sysplex	Part of PSLC Sysplex	Part of PSLC Sysplex		Part of PSLC Sysplex		Part of PSLC Sysplex		Part of PSLC Sysplex
MLC	zELC	zSeries Entry License Charge	No, Model Based Only		or equivalent to z800		Yes		110 Model only	110 Model only		A01 Model Only	A01 Model Only								
MLC	AWLC	Advanced Workload License Charges, Full and Sub-Cap	Yes	Yes												NO	Yes, if All Others z196	Yes	Yes, If all z196	Yes	Yes, Mixed PricingPlex with z196s
MLC		Technology Update Pricing for AWLC	Yes	Yes																Yes	Yes, if All zEC12s
MLC	VWLC	WorkLoad License Charge, Full and Sub-Cap	Yes	Yes			Yes	Yes	No, Use EWLC	Yes	Yes	No, Use EWLC	Yes	Yes	Yes	No	No	No	In Transition	No	In Transition
MLC	GSSP	Getting Started SubCapacity Pricing	Yes	Yes								Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	IWP	Integrated Workload Pricing	Yes	Yes								No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
MLC	FWLC	WorkLoad License Charge - Fixed Price Per Footprint	Yes	No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes
MLC	EWLC	Entry Workload License Charge	Yes	No			Yes		Yes		No, Consider WLC	Yes	No, Consider WLC							
MLC	EWLC Full Cap	Entry Workload License Charge		No	OS/390 Allowed		OS390 allowed, or not zArch	OS390 allowed	OS390 allowed		OS390 allowed	OS390 allowed								
MLC	AEWLC	Advanced Entry Workload License Charges, Full and Sub-Cap	Yes	No													Yes				
MLC	TWLC	Tiered Workload License Charge		No			Yes		Yes			Yes					Yes				
MLC	NALC	New Application License Charge (not available after z/OS 1.8)	Yes w/WLC, No w/PSLC	No	w/PSLC		No, Use z/OS.e	No, Use z/OS.e	No, Use z/OS.e	Yes	Yes	No, Use z/OS.e	No, Use z/OS.e	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC	No, Use zNALC
MLC	zNALC	System z New Application License Charges	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OTC (S&S)	Value Unit	Value Unit (Tivoli, Tools, WebSphere App Server, etc.)	Most, Execution, Reference & z/OS Based	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

zSeries, z/OS and zWorkload zPricing

Metric		Description	Sub-Capacity Allowed?	Aggregation Allowed?	Qualified Hardware							
					z9BC, z10BC Stand-Alone	z9BC, z10BC in Pricing Plex	z9EC, z10EC Stand-Alone	z9EC, z10EC in Pricing Plex	z114 Stand-Alone	z114 in Pricing Plex	z196 Stand-Alone	z196 in Pricing Plex
MLC	FLAT	Much Older Fixed MLC			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	PSLC	Parallel Sysplex License Charge	No	Yes		Yes			Yes	Yes	Yes	Yes
MLC	ULC	S/390 Measured Usage License Charge	No (Pay for actual CPU usage by the product)	Yes		Part of PSLC Sysplex	Part of PSLC Sysplex	Part of PSLC Sysplex		Part of PSLC Sysplex		Part of PSLC Sysplex
MLC	AWLC	Advanced Workload License Charges, Full and Sub-Cap	Yes	Yes					NO	Yes, if All Others z196	Yes	Yes, If all z196
MLC	VWLC	WorkLoad License Charge, Full and Sub-Cap	Yes	Yes	No, Use EWLC	Yes	Yes	Yes	No	No	No	In Transition
MLC	GSSP	Getting Started SubCapacity Pricing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MLC	IWP	Integrated Workload Pricing	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes
MLC	FWLC	WorkLoad License Charge - Fixed Price Per Footprint	Yes	Effectively NO	Yes	Yes	Yes	Yes			Yes	Yes
MLC	EWLC	Entry Workload License Charge	Yes	No	Yes	No, Consider WLC						
MLC	EWLC Full Cap	Entry Workload License Charge		No	OS390 allowed	OS390 allowed						
MLC	AEWLC	Advanced Entry Workload License Charges, Full and Sub-Cap	Yes	No					Yes			
MLC	TWLC	Tiered Workload License Charge		No	Yes				Yes			
MLC	zNALC	System z New Application License Charges	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OTC (S&S)	Value Unit	Value Unit (Tivoli, Tools, WebSphere App Server, etc.)	Most, Execution, Reference & z/OS Based	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4-Hour Rolling Average & Defined Capacity

CEC Capacity is 70 MSUs

4 HRA is Higher Than The Defined Capacity

Defined Capacity is 60 MSUs

Capacity Being Used, But Not Charged

The Flat Portion is the Throttling of the Intervals

IBM Will Only Charge for 60 MSUs, the Defined Capacity, Even When the 4Hr Rolling Average is 62 MSUs

z196, z114, zEC12 No Further Separation

- Beginning in August 2003 IBM separated the hardware's ability to run your work, from the "size" of the machine used for software pricing
  - I refer the MSUs calculated from the SRM constant as the "Hardware MSUs" and the MSUs announced for each machine, used for software pricing, as "Software MSUs"
- 1,000 HW MSU Workload Requires Approx.:
  - 1,000 SW MSUs on z900
  - 900 SW MSUs on z990
  - 770 SW MSUs on z9EC
  - 680 SW MSUs on z10EC
  - 680 SW MSUs on z196, zEC12 (YM-WILL-Vary, try zPCR!)
- No further separation on z114, z196 or zEC12

No Further Separation of HW MSUs and SW MSUs

- This is a significant change
- The separation in the past changed how machines were "measured" for IBM & ISVs
  - Depending on your contracts with other Vendors
- AWLC and TUP provide a discount depending on your software stack and "size of your shop"
  - AWLC and TUP have no effect on the software charges you pay to other vendors or for IBM's IPLA Products
- Previous MSU Separation provided a "plateau" or flattening of MSUs while your workload grew to consume the additional separation

Advanced Metrics Only available on z114s & z196s

- The savings is provided through changes in Pricing Tables for sub-capacity eligible MLC products
- Two new tiers are "activated" for AWLC

EWLC & AEWLC Tiers	EWLC	AEWLC
Base, includes 3 MSUs	5,009	4,008
4 - 17 MSUs	71	124
18 - 30 MSUs	258	230
31 - 45 MSUs	400	368
46 - 87 MSUs	126	124
88 - 175 MSUs	126	120
176 - 260 MSUs	94	89
261 - 315 MSUs	94	89
315 + MSUs	94	80

VWLC & AWLC Tiers	VWLC	AWLC
Base, includes 3 MSUs	5,009	5,009
4 - 45 MSUs	270	260
46 - 175 MSUs	126	119
176 - 315 MSUs	94	90
316 - 575 MSUs	71	68
576 - 875 MSUs	53	51
876 - 1315 MSUs	53	49
1316 - 1975 MSUs	53	47
1976 + MSUs	53	47

- My Studies Show There is More Significant Change in Pricing between EWLC and z114's AEWLC
- Note: NO Savings or plateau for IBM IPLA products or ISV products

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Technology Upgrade Pricing for AWLC on zEC12

- A reduction in AWLC based on the full-capacity zEC12 MSUs standalone or in a PricingPlex

```
    4  -       45 MSUs          2.0%
   46  -      315 MSUs          4.0%
  316  -    1,315 MSUs          4.5%
1,316  -    2,676 MSUs          5.0%
2,677  -    5,476 MSUs          6.0%
5,477  -     more MSUs          7.0%
```

- The big "news" here for larger sites is the larger tier base.
  - VWLC's last tier begins at 576   (1,976 for z/OS)
  - AWLC's last tier begins at 1,316 (1,976 for z/OS

The New Pricing Metrics

- Should lower MLC software charges as your move to newer hardware standalone or in a PricingPlex
  - You Must Sign New Contract "Attachments"
- There are transition plans as you migrate through the machine types that provide some portion of the metric's value while you have mixed hardware technologies in a PricingPlex

- To better understand the value of these metrics study "your" software stack(s) with the different metrics

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"Sample" Software Stack Every 750 MSUs

(z/OS, DB2 V8, CICS V3, MQ V6, COBOL, NetView)
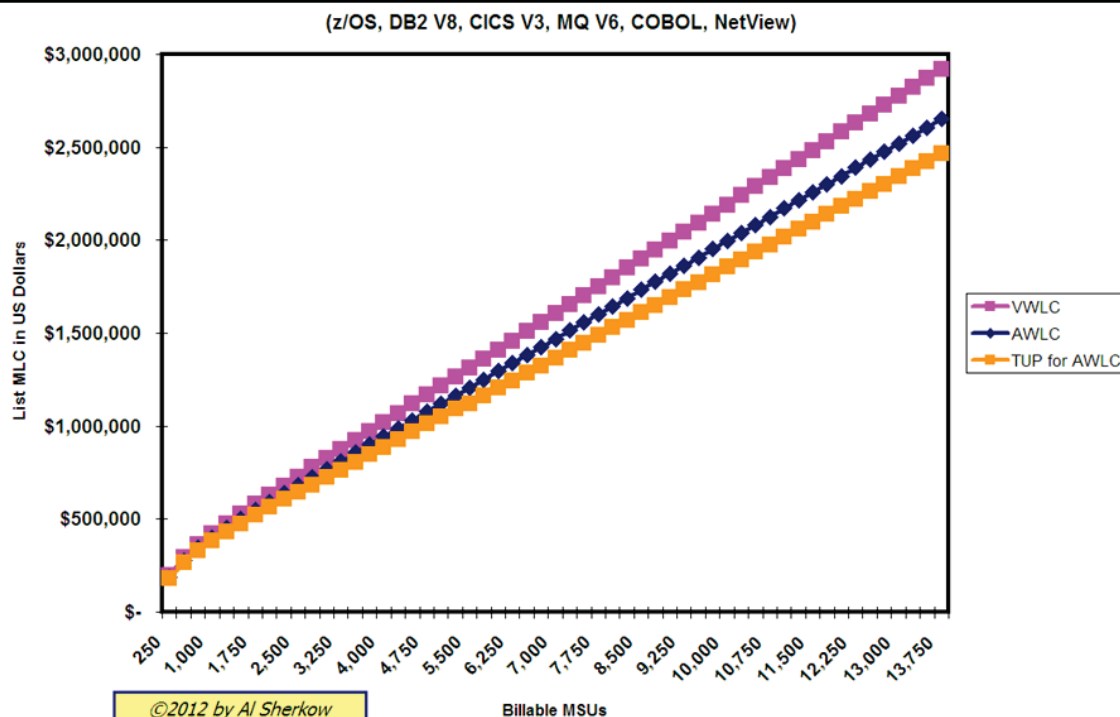
Remember this chart is for this "sample" software stack,
your charges may be higher or lower

My New Term: "Virtual" Tiers of Pricing for z/OS Base

5694-A01 S00T4FR z/OS V1 Base	PSLC PERMSU	Early VWLC PERMSU	Current VWLC PERMSU	AWLC PERMSU	TUP 316+ 4.5%	TUP 1,316+ 5.0%	TUP 2,677+ 6.0%	TUP 5,477+ 7.0%
Base Charge 3 MSUs	3,921	3,735	3,921	3,921	3,744.56	3,724.95	3,685.74	3,646.53
4 - 45	865	800	383	368	351.44	349.60	345.92	342.24
46 - 175	277	255	320	301	287.46	285.95	282.94	279.93
176 - 315	207	110	226	216	206.28	205.20	203.04	200.88
316 - 575	159	110	120	115	109.83	109.25	108.10	106.95
576 - 875	159	85	93	88	84.04	83.60	82.72	81.84
876 - 1,315	159	60	65	62	59.21	58.90	58.28	57.66
1,316 - 1,975	159	45	49	47	44.89	44.65	44.18	43.71
1,976 - 99,999,992	159	36	39	38	36.29	36.10	35.72	35.34

- **The light blue columns are additional levels of discounting not available previously**

"Virtual" Tiers for Sub-Capacity Products

5605-DB2 S015SW2 DB2 V10	PSLC PERMSU	Early VWLC PERMSU	Current VWLC PERMSU	AWLC PERMSU	TUP 316+ 4.5%	TUP 1,316+ 5.0%	TUP 2,677+ 6.0%	TUP 5,477+ 7.0%
Base Charge 3 MSUs	5,560	N/A	5,259	5,259	5,022.35	4,996.05	4,943.46	4,890.87
4 - 45	300	N/A	292	281	268.36	266.95	264.14	261.33
46 - 175	127	N/A	145	137	130.84	130.15	128.78	127.41
176 - 315	95	N/A	108	104	99.32	98.80	97.76	96.72
316 - 575	71	N/A	82	78	74.49	74.10	73.32	72.54
576 - 875	71	N/A	61	59	56.35	56.05	55.46	54.87
876 - 1,315	71	N/A	61	56	53.48	53.20	52.64	52.08
1,316 - 1,975	71	N/A	61	54	51.57	51.30	50.76	50.22
1,976 - 99,999,992	71	N/A	61	54	51.57	51.30	50.76	50.22

- **DB2 V10 in this example**
- **The green is highlighting tiers that are not being used in each column**
- **The light blue columns are additional levels of discounting not available previously**

Other Recent WLC Changes

- ## Integrated Workload Pricing (IWP) in 2011
  - 4 Hour Rolling Average MSUs of some WebSphere products are Subtracted From the LPAR's Full 4 Hour Rolling Average MSUs before computing Simultaneous 4 Hour Rolling Averages for CICS and IMS
    - This is 4HRA of some WebSphere product's actual CPU time is subtracted from the LPAR's (the container's) 4HRA
  - Provides less incremental MLC software increase when adding WebSphere products into existing LPARs
    - *Reducing a "barrier" to further use of WebSphere products on z*
    - May help current customers also

Wearing My "analyst" Hat: IWP

- ## IBM would like more sites to use WebSphere products on z
  - Evidence: "Getting Started Sub-Capacity Pricing" for WebSphere Products from 2008, revised in April 2009
  - Sites choose building new LPARs for WebSphere or adding WebSphere to current LPARs
    - Pros and Cons both technically and culturally
- ## IWP removes the actual 4HRA of Some WebSphere Products from the 4HRA of IMS and CICS in WebSphere LPARs
  - So … … If you add WebSphere to an existing LPAR the 4HRA of z/OS, DB2, MQSeries and other products probably increases as WebSphere grows in the container. CICS and IMS should not have the same 4HRA increase due to IWP
    - Disconnects WebSphere Products from IMS/CICS MSUs

IWP Requirements

```
Unique Machine Identifier: 2817#RRRR
              z196 Machine: Pass
     IWP Control Statement: YES
```

			LPAR Has	LPAR Has
	LPAR Has	LPAR Has	IWP	IWP
	APAR	z/OS 1.10	Defining	Adjusting
LPARNAME	OA31615	or Later	Programs	Programs
TST1	Fail	Pass	Yes	Yes
PRDD	Mixed	Pass	Yes	Yes
PRDM	Mixed	Pass	Yes	Yes
PRDS	Fail	Pass	No	No

IWP Highest Simultaneous 4HRA Before & After

```
Unique Machine Identifier: 2817#RRRR
            Product ID: 5655-M15 CICS TS V3
```

| | Original | | IWP | MSUs |
| Timestamp | Simult'n's| Timestamp | Simult'n's| Saved |
Before IWP	4HRA	After IWP	4HRA	With IWP
03FEB2011:12	1193	05FEB2011:02	979	214
03FEB2011:13	1186	05FEB2011:03	970	216
23FEB2011:13	1147	12FEB2011:00	899	248
23FEB2011:12	1139	05FEB2011:01	878	261
07FEB2011:13	1134	11FEB2011:23	875	259
08FEB2011:12	1133	25FEB2011:23	854	279

- "manufactured" test data for this example
- IWP reduces CICS Charges by changing the billable MSUs from 1,193 to 979, a savings of 214 MSUs
  - In This Range with AWLC CICS is 51USD/MSU savings $10,914/mo
- How is that peak hour 979 MSUs determined?

IWP Math by LPAR by Hour

Start of the Hour	LPAR	LPAR Orig 4HRA	IWP Defining Products 5655-M74 Subtract Product 4HRA MSUs	5655-N02 Subtract Product 4HRA MSUs	Total Subtrac-tions	LPAR IWP 4HRA
03FEB11:12	TST1	5		0.0	0	5
	PRDD	907	0.1	298.9	299	608
	PRDM	286	0.1	218.7	219	67
03FEB11:12		1198	0.2	517.6	518	680
05FEB11:02	TST1	4		0.0	0	4
	PRDD	527	0.1	28.2	28	499
	PRDM	483	0.0	2.9	3	480
05FEB11:02		1014	0.1	31.2	31	983

- Highest original hour was 1,193. TST1 was not running CICS during the hour
- IWP Highest hour also did not have CICS in TST1, resulting in 979 MSUs

IWP Review

- IWP may help IBM with new deployments of WAS, Processor Server, Message Broker, Enterprise Service Bus and other WebSphere Products on z
- ***You may already have these configurations in your shop and IWP may reduce your CICS and IMS monthly charges***
- If your site meets all the requirements including the hardware you can use SCRT to study the potential
- Before you satisfy the requirements there is only one tool I'm aware of that can do the analysis …

WebSphere Products With DB2 type 2 Connectors

- SCRT V19.2.0 User Guide: "SCRT subtracts the four-hour rolling average utilization of the DB2 time, which is used by the GSSP eligible product via the DB2 type 2 connector, from that GSSP product"
    - This further reduces the GSSP product's billable MSUs, but does not change DB2

WebSphere Products With DB2 type 2 Connectors

- This enhancement in SCRT V19.2.0 was not "announced", it was published in the SCRT User Guide
- z/OS 1.10+ and SMF APAR OA31615 are required (but not a z196)
- DB2 APARs and other requirements are in the SCRT V19.2.0 User Guide

- *GSSP is already **automatically** computed by SCRT and when the requirements for this enhancement are met*

WebSphere Products With DB2 type 2 Connectors

- If this applies at your shop there is an interesting twist:

  – The GSSP MSUs if you have DB2 type 2 Connectors for WAS, Process Server, Msg Broker or Enterprise Service Bus are

    SMALLER

    Than the IWP MSUs for the same products. IWP does not subtract the DB2 type 2 connector CPU time

One More Page on IWP

- Once your site has met all the requirements of IWP and

  if you have the IWP Defining Programs (products) in LPARs with CICS and IMS

  then IWP will not raise your software charges and IWP may lower your software charges

- However from the announcement letter "Your agreement to IWP terms and conditions is required for the receipt of IWP benefits."
  – The Addendum for Integrated Workload Pricing to Attachment for IBM System z Advanced Workload License Charges (Z125-8702)

Are the Number of IBM Audits Increasing?

- **Parallel Sysplex Audits**
  - For PricingPlex Validation
    - i.e. IBM is auditing that multiple machine aggregation is satisfying their rules
  - Requires the Customer to Use IBM's PlexCalc tool
- **Software Usage Audits**
  - May Install a Tivoli Audit Tool (based on Isogon's Softaudit)
  - May Required Your SMF Data for SCRT verification
  - Stopped accepting Standard Month SCRT input
    - i.e. You Must Include the 1st of the Month
  - IBM has even questioned a site's NO89 parameters, insisting for example is COBOL must be charged based on the entire machine

- **Can You Share Your Experience?**


What Are the Size Limits of an LPAR?

1. The "True Limit on Capacity" is the number of Logical Engines allocated to the LPAR Running at 100% Busy
2. Relative weight (now initial processing weight) is only a factor when contention exists for CP resource
3. Defined Capacity sets the limit that the rolling 4-hour average is held to by WLM
4. IRD Clusters, The Cluster Shares the Weight
   - Distributed Within the Cluster on Initial Processing Weight
   - Cluster Members Must Be on the Same Machine & on the Same Sysplex
5. LPAR Group Capacity Limits
   - MSU limit for a Group of LPARs on a Single Machine

What Are LPAR "Sizes" for WLC?

1. SCRT's "Highest" MSUs from Section N5: Detail LPAR Data
2. SCRT's Group MSUs for z/OS from Section P5 "Product Max Contributors"
3. The LPAR's 4HRA as reduced by WebSphere Products for IWP

Discussion, Questions?   Session Evaluations: 12997
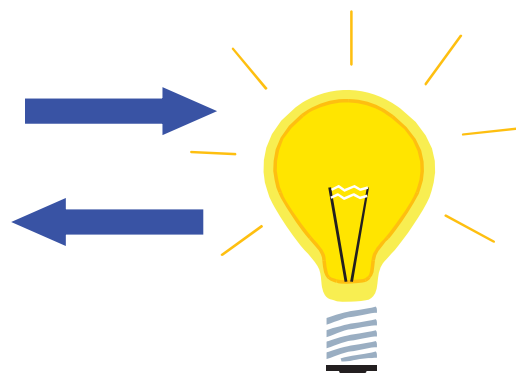
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