



VWLC

Part I: Introduction to VWLC

Introduction to VWLC: Agenda

- What is VWLC?
 - Origins and Terminology
- How does VWLC work?
 - The R4H (Rolling 4 Hours)
 - The SCRT (Sub Capacity Reporting Tool)
- IBM Soft-capping feature
 - The rules of Soft-capping
 - Invoicing with Soft-capping



VWLC – Origins and Terminology

- VWLC (Variable Workload License Charge) is an invoicing system for IBM z/OS based on the consumption.
“Pay for what you use” :
 - It is in line with IBM’s Mainframe Charter (created at the beginning of the 2000’s).
 - The goal was to increase the attractiveness of the System z platform.
- In VWLC each *Logical Partition* (LPAR) is represented by:
 - A Processing Weight (for its guarantee of power in MIPS).
 - A quantity of consumed MSU, used for the billing.
- VWLC terminology :
 - MSU (Million Service Units) : reference unit for Software
 - IMSU (or ACTMSU) : instantaneous MSU consumption
 - R4H: Rolling Four Hours
 - DC: Defined Capacity
 - Capacity: The CPC Full capacity
 - Billing space: MSU value of consumption used for the bill
 - White Space: $WS = Capacity - Billing\ Space$



How does VWLC work?

Introduction to VWLC

VWLC - the R4H

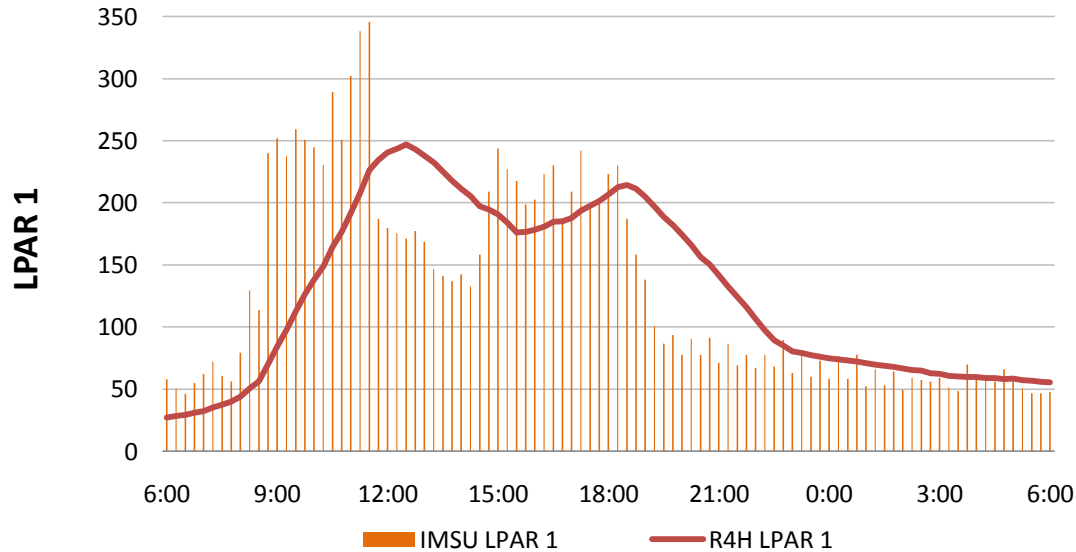
The R4H represents **the average consumption (in MSU)** of the LPAR during the last 4 hours
 = Average of the last 48 IMSU metrics.

6:00							... 8:00	... 9:00		10:00	
99	98	100	105	119	110	115		135	138	145

R4H
118

6:05							... 8:00	... 9:00		10:05		
98	100	105	119	110	115			135	138	145	147

R4H
119



VWLC – IBM Sub Capacity Reporting Tool

- SCRT (Sub Capacity Reporting Tool) is a tool used by IBM for z/OS billing.
- It uses the following SMF records : SMF 70-1 and SMF 89-1 / 89-2
- The SCRT is computed on a monthly basis :
 - During the month (from the second day of the month at 0h00 to the first day at 24h00 of the following month),

$$\text{SCRT} = \underset{\text{1 month}}{\text{MAX}} \left(\underset{\text{LPARS}}{\text{SUM}} \left(\underset{\text{in 1 hour}}{\text{Average R4Hs}} \right) \right)$$

→ That means that the billing is based on peaks of consumption, so any higher peak of consumption will increase the software bill.

- [Sub-Capacity Eligible Monthly License Charge Software](#)
- [IBM System z Software Pricing](#)



IBM Soft-Capping feature

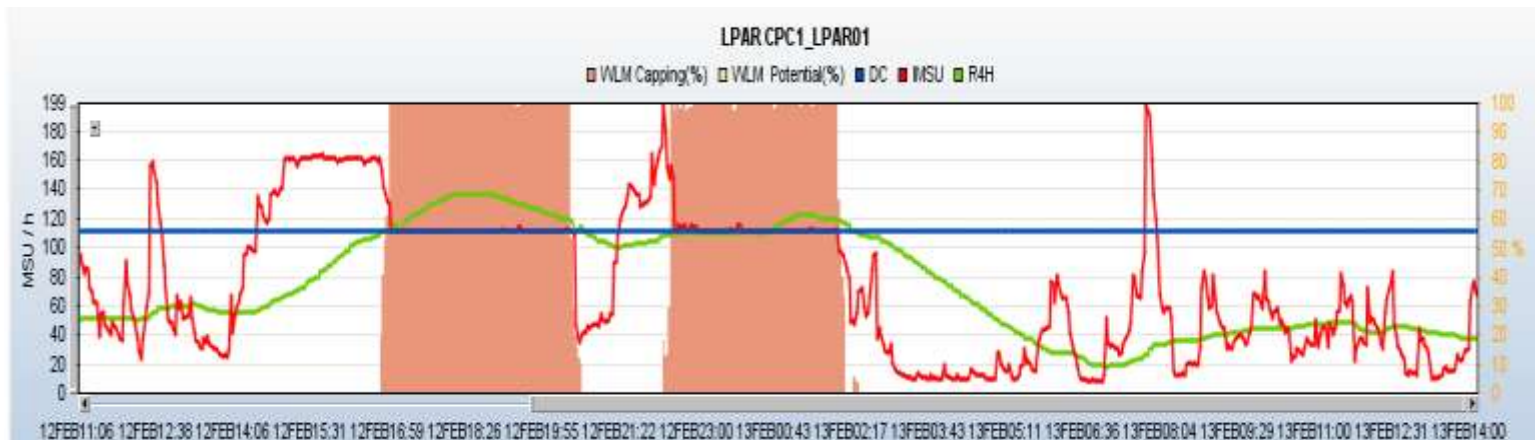
Introduction to VWLC

IBM Soft-Capping feature

- IBM Soft-Capping is a feature which allows the control of z/OS bill by defining for each LPAR a MAXIMUM for the average consumption of MSU (R4H)
 - This limit is called Defined Capacity (DC)
- The Soft-Capping rule:
 - When Rolling 4 Hours (R4H) becomes superior or equal to DC then the LPAR is capped. That means that the IMSU consumption will not be able to exceed DC anymore until the R4H becomes lower than the DC.

When $R4H > DC$, IMSU is limited to DC, until $R4H < DC$.

- Example of an LPAR which is capped:



Soft-Capping Feature – Invoicing

- How does IBM Soft-Capping feature allow you to control the Software bill?
 - When using the IBM Soft-Capping feature, SCRT is computed as follows:

$$\text{SCRT} = \underset{\text{in 1 month}}{\text{MAX}} \left(\underset{\text{LPARs}}{\text{SUM}} \left(\underset{\text{in 1 hour}}{\text{min}} \left(\text{Average R4Hs}, \text{DC} \right) \right) \right)$$

- So it takes into account *either* the peak of R4H *or* the DC.

Soft-Capping feature – Invoicing (Example)

Without Soft-Capping

With Soft-Capping

Hour/ LPAR	Hour 1	Hour 2	...	H 720	Hour/ LPAR	Hour 1	Hour 2	...	H 720
LP1	51/53/52/49 Av = 51,25	48/53/52/55 Av = 52	...	50/48/46/45 Av = 47,25	LP1 DC=50	51/53/52/49 Av = 51,25 > DC	48/53/52/55 Av = 52 > DC	...	50/48/46/45 Av = 47,25 < DC
	→ 51.25 Value retained to compute SCRT	→ 52		→ 47.25		→ 50 Value retained to compute SCRT	→ 50		→ 47.25
LP2	70/68/69/74	72/68/69/74	...	75/72/67/71	LP2 DC=69	70/68/69/74	72/68/69/74	...	75/72/67/71
	→ 70.25	→ 70.75		→ 71.25		→ 69	→ 69		→ 69
LP3	81/83/82/79	80/84/84/82	...	82/79/80/81	LP3 DC=81	81/83/82/79	80/84/84/82	...	82/79/80/81
	→ 81.25	→ 82.5		→ 80.5		→ 81	→ 81		→ 80.5
LP4	11/13/12/15	11/13/12/11	...	13/11/13/12	LP4 DC=12	11/13/12/ 15	11/13/12/11	...	13/11/13/12
	→ 12.75	→ 11.75		→ 12.25		→ 12	→ 11.75		→ 12
Total	215.5	217	...	211.25	Total	212	211.75	...	208.75