



Group Capacity (Easier savings with WLC ?)

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1 Introduction

The VWLC policy is the real innovation of the WLC software pricing policy proposed by IBM in the mainframe environments. This policy is applicable to their major software products when they run on z/OS on a zSeries (or later) machine.

VWLC allows you to pay software license fees based on the CPU usage (in MSUs) instead of the CPC capacity.

The “good news” is that the CPU usage is calculated based on a 4-hour rolling average¹; depending on the workload characteristics this value can be much lower than the power of the machine, which is normally sized to guarantee the service levels during a few peak hours.

The “bad news” is that the VWLC software license fee is a monthly fee based on the **maximum** value of the measured 4-hour rolling average. The complexity of today systems and workloads together with human errors makes it very probable that a company will pay for the full capacity of the CPC most of the time.

To guarantee the expected savings IBM introduced since the beginning the possibility to set a “defined capacity” limit at the LPAR level, which was not a real solution for most customers.

Finally, in z/OS 1.8, IBM introduced the “group capacity” concept and the possibility to set a limit at the CPC level which seems to be a much more effective option.

2 Defined Capacity

Defined capacity is a limit to the number of MSUs an LPAR can use during the 4-hour rolling average, but during the peaks the LPAR can still use all the MSUs assigned to it in the PRSM definitions. Unfortunately this is not a real solution for customers running more than one LPAR in the same machine.

¹ The sum of the measured 4-hour rolling MSU averages for all the LPARs in the CPC.



Let's consider a very simple situation:

- *CPC 123 has a capacity of 100 MSUs but management puts in the budget a software cost based on a 90 MSU 4-hour rolling average so the technical team decides to set defined capacity limits to guarantee this goal;*
- *Only two LPARs run in the CPC: PROD (production) and DEV (development);*
- *The technical team decides to set PROD and DEV capacity limits to 60 and 30 MSUs respectively.*

In an ideal world PROD will need 60 MSUs, DEV will need 30 MSUs and both the management and the technical team will be happy.

Unfortunately we don't live in such a world so the situation shown below will probably be the real one.

The first column represents the LPAR needs: DEV is very lightly loaded (10 MSUs) while PROD needs 70 MSUs more than its defined capacity limit. The second column represents the MSUs allowed by the define capacity limits. The third column is what each LPAR gets. At the top of each column there is the White Space (WS) representing the MSUs usable in the peaks but not in the 4-hour rolling average. No license fee will be paid for these MSUs.

WLM enforces the define capacity limits by "soft capping" PROD; this causes part of PROD MSU needs to become "unmatched demand" with likely impacts on the applications. At the same time there are a lot of MSUs available in the machine (20 in this example).

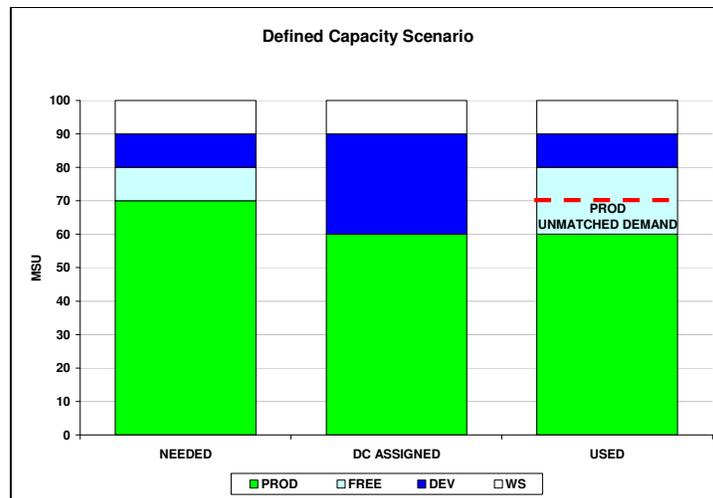


Figure 1

CPC configurations are normally much more complicated than in the previous example; so the lack of flexibility, and the possibility to waste resources, introduced by setting defined capacity limits to guarantee money savings to the management makes this approach unusable.



3 Group Capacity

Group Capacity is an extension of the defined capacity concept that allows Capacity Groups to be created by putting together a set of LPARs running on the same CPC and assigning a group limit to the amount of MSUs the group of LPARs can use in the 4-hour rolling average.

Capacity groups have to be defined in the HMC by setting the Group Name and the Group Limit to the LPARs that belong to the group.

The following rules apply when creating a Capacity Group:

- LPARs have to be on the same CPC
- CPC has to be a z9-EC or a z9-BC
- LPARs must run z/OS 1.8
- an LPAR can only belong to one group
- LPARs must be assigned shared CPs and wait completion equal to NO.

It's important to note that a capacity group is independent of a sysplex and an LPAR cluster

Capacity Groups can be used to guarantee the expected savings to the management when adopting VWLC while maintaining the needed flexibility to maximize resource utilization.

Let's consider a slightly different scenario:

- *CPC 123 has a capacity of 100 MSUs but management puts in the budget a software cost based on a 90 MSU 4-hour rolling average so the technical team **decides to create a capacity group named GROUP123 and to set the group limit to 90 MSUs;***
- *Only two LPARs run in the CPC: PROD (production) and DEV (development); **they both are assigned to GROUP123.***

WLM uses the weight definitions to set the target MSU value of each partition.²

The following table shows the target MSU values calculated for the PROD and DEV LPAR.

LPAR	GROUP NAME	GROUP LIMIT	WEIGHT	TARGET MSU
PROD	GROUP123	90	666	60
DEV	GROUP123		334	30

Table 1

Target MSU is the maximum amount of MSUs an LPAR can use if all the partitions of the group want to use as much CPU resources as possible. If one or more LPARs do not use their share or have a defined capacity³ less than the target MSU value, the unused capacity will be distributed over the LPARs which need additional capacity.

In the following picture a much more effective scenario is presented. Thanks to Group Capacity, WLM can get MSUs not used (donated) by DEV to help PROD.

² This value is also called minimum entitled capacity.

³ Group Capacity can coexist with Defined Capacity.

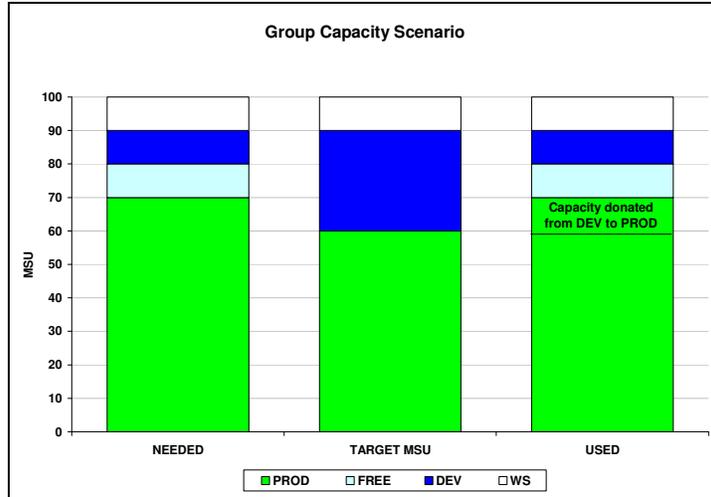


Figure 2

Group Capacity works together with IRD supporting both Weight and Vary CPU Management.

4 Conclusions

Group Capacity is a new function available in z/OS 1.8 that greatly improves the effectiveness of VWLC.

By creating a Capacity Group that includes all the LPARs hosted on a CPC, it will be possible to decide the MSUs to be used in the 4-hour rolling average from all the LPARs in the group considered as a whole, and consequently the amount of money saved for VWLC products license fees can be guaranteed.