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IT Cost  
Under Control

# EPV Technologies

## Newsletter

June 2021

### THIS MONTH HIGHLIGHTS

- Planning disk storage - Part 1
- EPV User Group 2021
- Important IBM corrections

### Planning disk storage - Part 1

The capacity planning methodology for disk storage is conceptually about the same as for other resources such as CPU, zIIP, etc.

The basic steps are:

- 1) define the “horizon” of the CP study,
- 2) estimate current machine capacity,
- 3) evaluate the baseline,
- 4) estimate natural and planned growth,
- 5) forecast future needs,

6) estimate the additional capacity needed in Disaster Recovery scenarios.

Steps 1, 2 and 6 are very customer dependent, so they will not be covered in this paper.

After a short discussion about which input measurements are most relevant and what you must care about when collecting them in a performance database, we will focus on steps 3, 4, and 5 which are the “core” topics of the methodology.

All the graphs and report in this paper refer to a real capacity planning study.

All the system, sysplex and storage group names have been changed so as not to disclose any customer information.

If you want to receive the paper you can reply to this e-mail writing **"Planning disk storage – Part 1"** in the subject

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## EPV User Group 2021

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The XIX EPV User Group will be a “virtual” user group.

It will be spread across two days and, to allow the widest possible participation, all presentations will be repeated in two sessions:

- Session 1: 11-12 October 2021
- Session 2: 13-14 October 2021

The EPV User Group is a "not to miss" event for all Performance Analysts; it will give you the opportunity to share ideas with qualified experts and to listen to some of the EPV customers experiences. The most interesting features provided by the latest versions of all EPV products will also be presented.

The EPV User Group is free of charge and reserved to EPV customers. If you are not a customer yet but you are interested in participating, please answer to this e-mail asking for an invitation.

Mark these dates in your agenda to avoid missing this event.

More details in next newsletters.

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## Important IBM corrections

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OA60641: GROUP CAPACITY LIMIT IS NOT PROPERLY ENFORCED WHEN THE SYSTEM HAS ABSMSUCAPPING ACTIVE AND THERE IS NO DEFINED CAPACITY LIMIT

Group Capacity limit not properly enforced at z/OS 2.3 when Group Capping and Absolute MSU Capping are both active and there is no defined capacity limit.

When ABSMSUCAPPING is active each group member should always enforce capping at its share of the group capacity. The error is in the case that the group 4 hour consumption is still below the group limit each member may be capped at the Group Limit instead of the share of the Group Limit.

More details at: <https://www.ibm.com/support/pages/apar/OA60641>

OA60394: AFTER OA59122 MAY SEE HIGH RATE OF FALSE CONTENTION FOR LOCK STR

With the PTF for OA59122, there may be performance impact due to a higher false contention rate for a lock structure. This higher rate of contention will drive a higher rate of XCF signalling requests to the locking group members (group name IXCLOxxx).

In the case of the GRS ISGLOCK structure, this also cause a performance impact to ENQ/DEQ processing resulting in higher rate of real ENQ contention due to higher rate of GRS local lock contention.

More details at: <https://www.ibm.com/support/pages/apar/OA60394>




Where can I find information about system soft capping in EPV for z/OS?  
Can you also provide some screenshots and explanations of the most relevant metrics?

***EPV Technical Support answer***

The best approach is starting from SYSTEM DAILY TRENDS and then choose the system you want to analyze.



In the page menu you need then to select the SYSTEM SOFT CAPPING view.

It will provide you the percentage of the time the system has been soft capped in the last 60 days (by default) hour by hour.

SYSTEM SOFT CAPPING 

SYSTEM SOFT CAPPING - PROD - %																										
SYSTEM	DATE	DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PROD	2021-05-26	Wed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROD	2021-05-25	Tue	76	31	0	0	0	0	0	0	0	0	0	0	87	61	0	0	0	0	0	0	0	0	0	0
PROD	2021-05-24	Mon	0	0	0	0	0	0	0	0	0	0	0	0	73	51	38	16	46	0	0	0	0	0	0	0
PROD	2021-05-21	Fri	0	0	0	6	8	0	0	0	0	0	0	0	36	54	4	0	0	0	0	0	0	0	0	0
PROD	2021-05-20	Thu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROD	2021-05-19	Wed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROD	2021-05-18	Tue	0	0	0	0	0	0	0	0	0	24	98	82	83	2	0	0	0	0	0	0	0	0	4	35
PROD	2021-05-17	Mon	0	0	0	0	0	0	0	0	0	0	26	48	69	0	0	0	0	0	0	0	0	0	0	0

From the above view you can select a date and go to the SYSTEM WLC USAGE view for a more detailed analysis. We selected 2021-05-25 in this example.

< SYSTEM WLC USAGE >  

SYSTEM WLC USAGE - Tue, 25 May 2021 - PROD															
METRIC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CEC MSU	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0
IMAGE MSU	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0
GROUP MSU	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0
DEF MSU	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
MIN ENT	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9	403,9
ROLLING 4*HOUR	437,5	438,2	391,0	340,5	291,7	235,5	175,0	185,2	228,3	305,3	401,8	439,3	460,5	456,5	443,8
MAX ENT	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0
% ACT SOFTCAPP	75,8	31,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	86,9	61,8	0,0
% WLM SOFTCAPP	76,2	61,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	90,9	63,3	0,0
GROUP MSU AVA	-32,2	-9,3	52,0	127,0	189,7	246,7	306,0	285,7	230,8	143,5	41,5	7,7	-9,7	-1,0	13,5
ABS MSU CAPP															

In this view:

- % ACT SOFTCAPP is the percentage of the hour the system has been capped and corresponds to what you saw in the system daily trends (source metric is SMF70NCA);
- % WLM SOFTCAPP is the percentage of the hour WLM selected the system for capping (source metric is SMF70NCA); it is normally higher than % ACT SOFTCAPP because it may have happened that WLM was ready to cap the system, but the system was not using more than its minimum entitlement (MIN ENT) in that moment.

In this case, you can also understand that the system is capped because the group capacity limit has been reached. You know that because the defined capacity limit in DEF MSU (source metric is SMF70MSU) is not set and the MSUs available to the group in GROUP MSU AVA (source metric is SMF70GAU) are negative.

You can analyze soft capping also at the RMF interval (10 minutes in the example below).

In the example below, which refers to a different day and system, the system is capped because the defined capacity limit has been reached.

You know that because:

- the defined capacity limit in DEF MSU is set to 51,

- in the first two intervals the system used more than 51 MSUs as you can see in ROLLING 4\*HOUR,
- the MSUs available to the group in GROUP MSU AVA are not negative.

< RMFINT SYSTEM WLC USAGE >  

 RMFINT SYSTEM WLC USAGE - Thu, 20 May 2021 - TEST

METRIC	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00
CEC MSU	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0	6.050,0
IMAGE MSU	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0
GROUP MSU	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0	545,0
DEF MSU	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0
MIN ENT	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5
ROLLING 4*HOUR	60,0	53,0	45,0	40,0	36,0	32,0	27,0	25,0	24,0	22,0	20,0	19,0	18,0
MAX ENT	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0
% ACT SOFTCAPP	23,9	0,9	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
% WLM SOFTCAPP	100,0	100,0	30,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
GROUP MSU AVA	97,0	99,0	93,0	82,0	71,0	65,0	61,0	62,0	66,0	70,0	81,0	92,0	89,0
ABS MSU CAPP													



## Other read I/O suspensions

Other read I/O suspensions occur when get page operations have to wait because the needed pages are already involved in prefetch operations (sequential prefetch, list prefetch, dynamic prefetch) or in synchronous read I/Os performed by other threads.

High number of other read I/Os can be mostly due to:

- excessive get pages; you should check the application access path;
- buffer pools to be tuned; you should check the VPSEQT parameter and the buffer pool size.

In case the average suspension time is too long, disk I/O performance should be investigated.

All prefetch operations are managed by DBM1 running on zIIP. So, you should also check that zIIP capacity is not severely constrained.



Metrics about other read I/O suspensions are provided, both at plan (IFCID 003) and package (239) level, in the following fields of SMF 101 records:

- QWACAWTR, accumulated waiting time due to other read I/O (IFCID 003);
- QWACARNR, number of suspensions due to other read I/O (IFCID 003);
- QPACAWTR, accumulated waiting time due to other read I/O during the execution of this package (IFCID 239);
- QPACARNR, number of suspensions due to other read I/O during the execution of this package (IFCID 239).

## Quotes



*"You don't have to see the whole staircase, just take the first step."*

**Martin Luther King**

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