Tuning Stories

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Problem: Excessive CPU used by a test IMS subsystem

Environment description

A production system (PROD) running 6 IMS subsystems:

- IMS1, IMS3 and IMS6 for production;
- IMS2, IMS4 and IMS5 for applications test.

PROD is hosted on IBM 2097-722.

Problem Analysis:

Figure 1 shows the total amount of CPU seconds used by each IMS system in April 2012.

IMS TOTAL CPU TIME BY IMSID - PROD								
DATE	DAY	SUSEC	IMS1	IMS2	IMS3	IMS4	IMS5	IMS6
04/30/2012	MON	34.188	2.252	19.306	6.559	518	1.002	5.685
04/27/2012	FRI	34.188	2.180	18.217	6.904	575	148	5.685
04/26/2012	THU	34.188	2.312	19.760	7.592	565	364	6.374
04/24/2012	TUE	34.188	2.243	19.417	7.720	547	717	6.873
04/23/2012	MON	34.188	1.749	17.912	7.057	531	1.826	3.176
04/18/2012	WED	34.188	2.415	18.963	7.090	525	5.032	6.323
04/17/2012	TUE	34.188	2.474	18.545	6.898	525	3.718	5.354
04/16/2012	MON	34.188	2.182	16.732	6.745	491	1.947	5.611
04/13/2012	FRI	34.188	2.456	19.137	6.783	499	2.238	6.873
04/12/2012	THU	34.188	1.502	18.545	3.061	505	462	5.215
04/11/2012	WED	34.188	2.452	18.714	7.502	545	782	5.618
04/10/2012	TUE	34.188	2.372	17.952	6.672	510	5.535	5.891
04/06/2012	FRI	34.188	2.237	16.765	6.304	489	1.104	5.232
04/05/2012	THU	34.188	2.217	17.419	6.745	482	301	5.562
04/04/2012	WED	34.188	2.422	19.098	6.918	515	218	5.397
04/03/2012	TUE	34.188	2.437	17.996	6.698	472	171	6.046
04/02/2012	MON	34.188	2.294	18.719	6.980	479	2.744	4.960

Figure 1

The consumption on IMS2 appeared to be abnormal: it was very high; much higher even than the production subsystems. It also looked to be very stable, which is unusual in a test environment.

The hourly profile – calculated by averaging the prime shift hours of the last week – confirmed this "strange" workload stability.

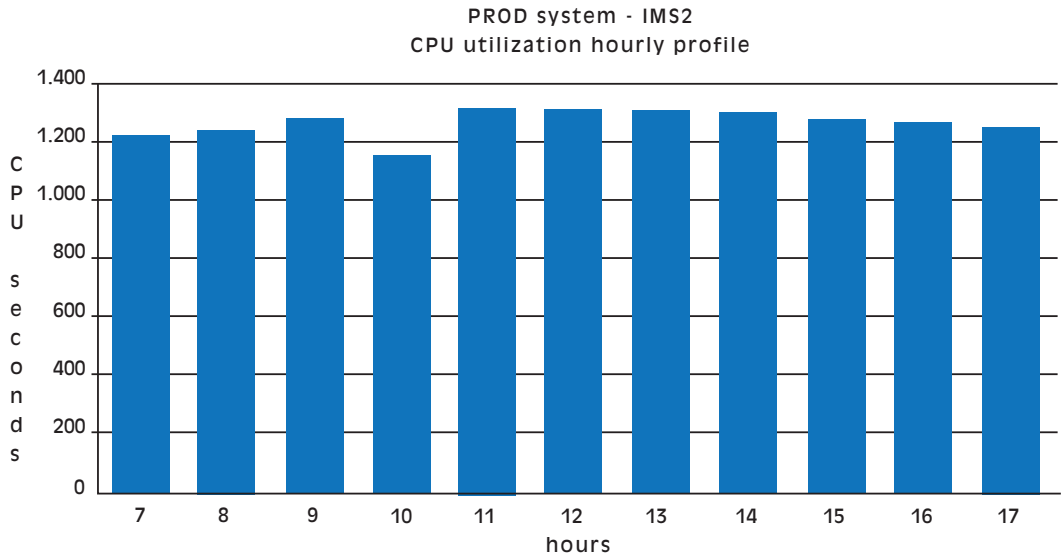PROD system - IMS2
CPU utilization hourly profile

Figure 2

Drilling down at the transaction level, we realized that most of the CPU consumption could be attributed to the execution of two particular transactions: F5B4 and F515.

TOTAL CPU SECS BY HOUR – PROD – MON, 30 APR 2012												
IMSID	TRANSACT	7	8	9	10	11	12	13	14	15	16	17
IMS2	F5B4	443	467	524	545	542	543	528	502	534	511	483
IMS2	F515	431	452	509	532	532	532	514	489	522	491	467
IMS2	MOTM	22	22	24	24	24	26	25	24	25	23	22
IMS2	FOXT	17	17	19	20	20	20	20	19	20	19	18
IMS2	M5U3	11	11	11	12	12	12	11	11	12	11	11
IMS2	M5S3	11	11	11	11	11	11	11	11	11	11	11
IMS2	M5U2	7	7	8	8	8	8	8	7	8	7	7
IMS2	M5U4	7	7	7	7	7	7	7	7	7	7	7
IMS2	M5S2	6	6	6	6	6	6	6	6	6	6	6

Figure 3

Why were these transactions using so much CPU at every hour of the day?

Solution:

After some phone calls and a short meeting with the application developers, the problem was solved by simply cleaning up some archives.

Results:

The result is presented in Figure 4.
After cleaning the archives on the morning of May 2, the CPU used by F515 and F5B4 has become almost negligible.

TOTAL CPU SECS BY HOUR – PROD – MON, 30 APR 2012											
IMSID	TRANSACT	7	8	9	10	11	12	13	14	15	16	17
IMS2	F5B4	491	505	67	5	6	7	5	6	6	7	5
IMS2	F515	512	519	80	0	0	0	0	0	0	0	0
IMS2	MOTM	22	24	24	26	26	26	25	25	26	25	24
IMS2	FOXT	18	19	22	21	21	21	20	21	21	20	20
IMS2	M5U3	11	11	12	12	12	12	12	12	12	11	11
IMS2	M5S3	11	11	11	11	12	11	11	11	11	11	11
IMS2	M5U2	7	7	8	8	8	8	8	8	8	8	8
IMS2	M5U4	7	7	7	7	8	7	7	7	7	7	7
IMS2	M5S2	6	6	6	6	6	6	6	6	6	6	6

Figure 4

Figure 5 compares the total CPU used by IMS2 in the last 3 days before the tuning action (red lines) and in the following 3 days (green lines).
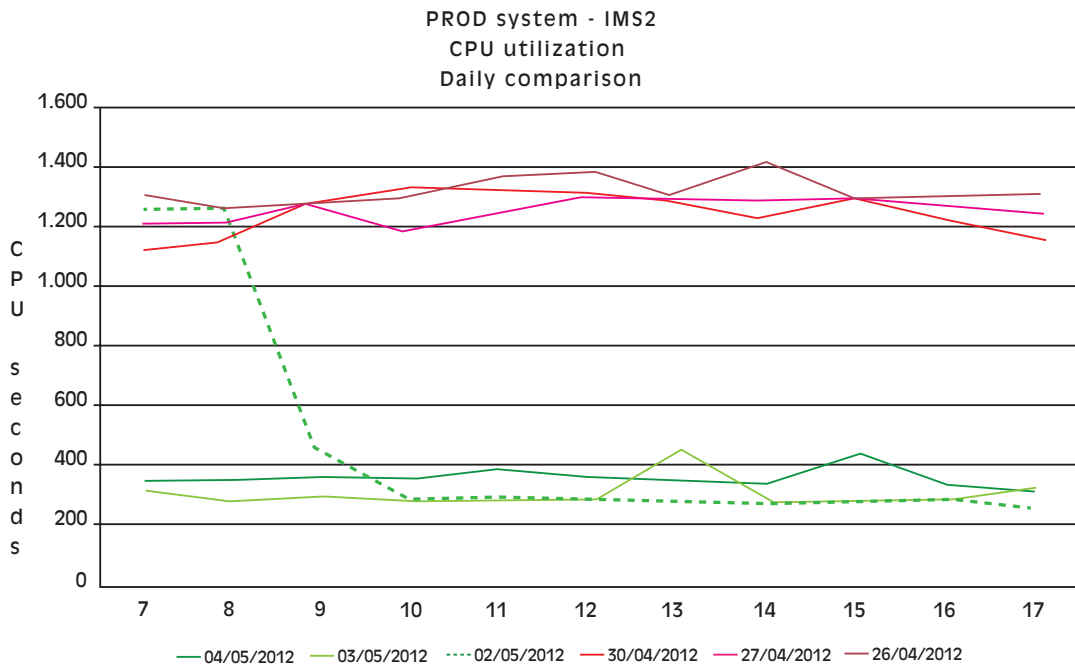

Figure 5

What does this mean in terms of MIPS?

PROD system - IMS2
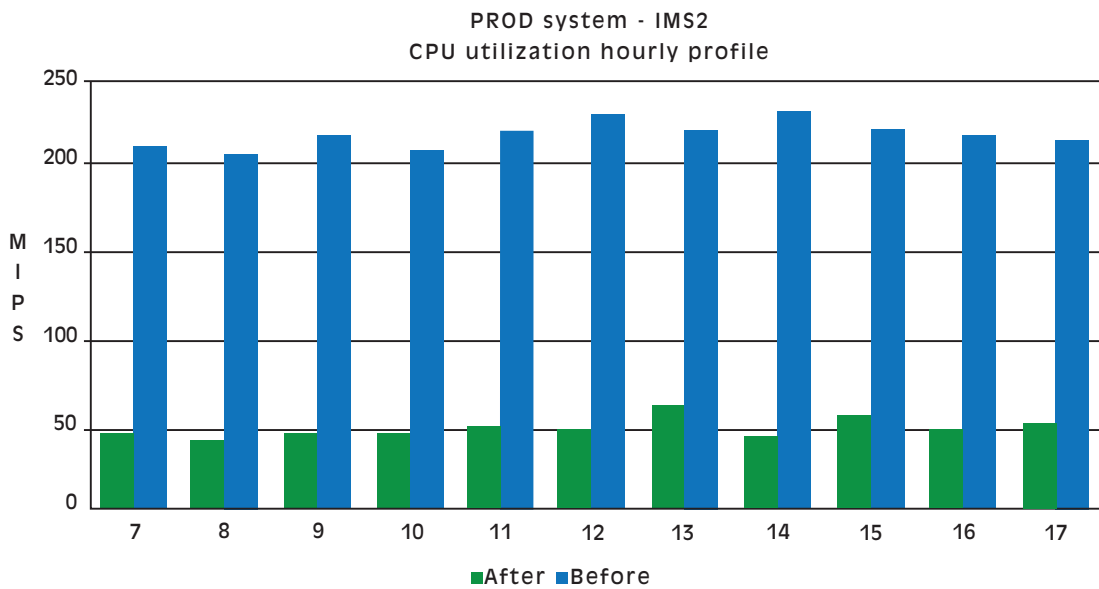### CPU utilization hourly profile

Figure 6

Figure 6 compares the average MIPS used in April and the average MIPS used in May (up to May 25) by the IMS2 subsystems.

More than 150 MIPS were saved.