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MPL 46

TO: Multics Performance Log
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SUBJECT: Results of Multics Performance Measurements
and Some System Operational Statistics
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The recent results of Multics performance measurements are summarized below in 1. Some of the operational statistics collected during the measurement period are shown in 2.

Recently the user simulator program with a real time clock came into operation. It records a clock time when each line of information is transmitted to and from the simulator. Therefore, an accurate measurement of a system response time and a total real time of the experiment will be possible. In fact, MPM86 was exercised by this new simulator program which is under additional modification.

1. Results of Performance Measurements

time unit: second
average: per interaction

Date	Run #	# of users	system	Total CPU time	Total # of P.F.	Total real time	Average CPU time	Average # of P.F.
12/12	MPM77	25	4.9F	52.717	2624	2670	.798	39
12/15	MPM78	26	4.9F	52.370	2506	2790	.793	37
12/16	MPM79	26	4.9F	46.615	2434	2610	.706	36
12/16	MPM80	26	4.9F	55.531	2776	3030	.841	42
12/30	MPM81	16	5.1	46.874	2674	2310	.710	40
12/30	MPM82	15	5.1	42.774	2459	2250	.648	37
1/2/70	MPM83	19	5.1g	54.046	2869	2370	.818	43
1/6	MPM84	17	5.1g	51.558	2597	2370	.781	39
1/26	MPM85	21	5.5	50.136	2804	2370	.759	42
1/31	MPM86	11	5.6F	42.091	2577	2240	.637	39

Note that the total real time required to complete the measurement has been drastically shortened after MPM80 on account of the installation of the DS-270 disk units.

2. Typical System Statistics

Some operational statistics collected in MPM81 and MPM85 (after the DS-270 disk installation) are shown in Table I. These data can be directly compared with Table I of MPL-45 (before the DS-270 disk installation).

Table I Typical System Statistics

System	5.1	5.5
No. of users obtained from:	16 MPM81	21 MPM85
PDP8 user		
total CPU time	46.8 sec.	50.1 sec.
total no. of P.F.	2674	2804
total real time	2310 sec.	2370 sec.
paging rate	42.8%	41.9%
tcm		
ave. queue length	4.4	6.1
total idle time	20%	13%
multi-prog. idle time	6%	13%
non-multi-prog. idle time	7%	0%
zero idle time	7%	0%
M.T.B. Interactions	1.6 sec.	2.3 sec.
fsm		
drum reads	28.2 /sec.	37.1 /sec.
drum writes	13.2 /sec.	18.6 /sec.
total drum access	41.4 /sec.	55.7 /sec.
DS270 reads	1.48 /sec.	2.64 /sec.
DS270 writes	.93 /sec.	1.91 /sec.
total DS270 access	2.41 /sec.	4.55 /sec.
DS10 reads	.48 /sec.	.54 /sec.
DS10 writes	.24 /sec.	.17 /sec.
total DS10 access	.72 /sec.	.71 /sec.

Before the DS-270 disk installation, the total CPU idle time was about 32% when the system is loaded with 21 users (See Fig. I of MPL-45). Therefore, the total CPU idle time has decreased from 32% to 13% on account of the faster disk installation (21 user case). It is also seen that the drum access rate has increased by about 50%. As a result, the users now have much faster system response.

3. System Response Time

The implementation of a real time clock on the PDP-8 user simulator has enabled an accurate measurement of the system response time (= time during which a user has to wait for the first response line from the system after issuing the input line). The histogram of the system response times observed in MPM86 is shown in Figure 1.

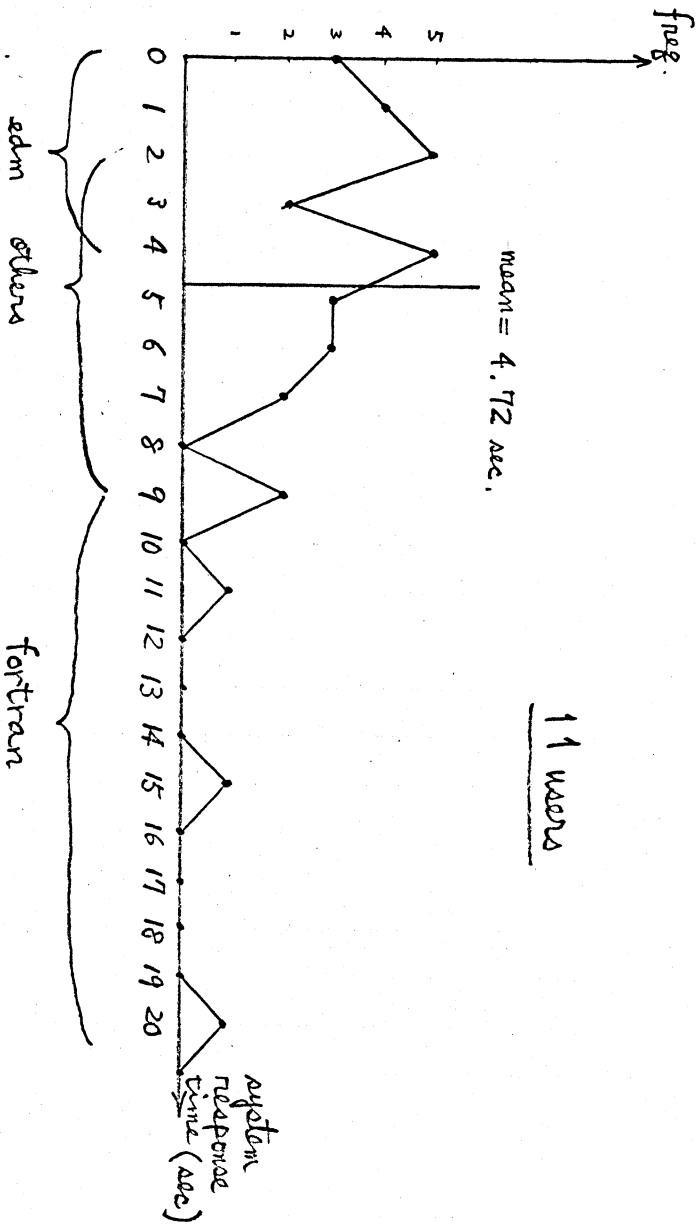


Figure 1. Histogram of System Response Times (MPM86)