

TO: MTB Distribution
FROM: Roger A. Roach
DATE: March 17, 1975
SUBJECT: Multics Performance Test Results

Attached is a summary of the results from the performance tests done between November 3, 1974 and March 13, 1975. Note that the conversion to the faster processors with cache took place during this period (CPU C was renamed to CPU B before the February 10th test). Also the goals have been revised to allow for a 10% improvement due to changes in the dumper.

	revised goal	25.2 values	% to goal
Elapsed Time:	65.2 min.	68.0 min.	94.8%
Virtual CPU:	2318 sec.	2321 sec.	99.8%
Total CPU:	3717 sec.	3609 sec.	103.6%
Page Faults:	362855	461868	66.6%
Memory Units:	25065	38576	34.1%

Related MTB's:

MTB-126 Revision of Multics Performance Tests
MTB-132 Multics Performance Test Results
MTB-146 Backup Performance Gains

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Metering Comparisons for 24.1c, 24.2, 24.3, 24.7

System:	24.1c	24.2	24.2	24.2	24.3	24.3	24.3	24.7	24.7
Date:	11/03/74	11/10/74	11/16/74	11/25/74	11/30/74	12/09/74	12/16/74	02/01/75	02/03/75
Script:	script2	script2	script2	script2	script2	script2	script2	script2	script2
Write-through status:	none	none	none	none	none	none	none	none	none
Device Checking:	1	1	1	1	1	1	1	1	1
SYST:	2	2	2	2	2	2	2	2	2
CPU:	B	A	B	B	B	A	C	C	A
Cache:	none	none	none	none	none	none	on	on	on
Memories:	A,B	A,C	B,C	C,B	A,B	A,C	A,B	A,B	A,B
External Interlace:	off	off	off	off	off	off	off	off	off
Paging Device Size:	2048K	2048K	2048K	2048K	2048K	2048K	2048K	2048K	2048K
Disk Channels:	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8
Elapsed Time:	92.0 min	89.7 min	90.4 min	90.2 min	89.7 min	88.3 min	71.1 min	70.3 min	67.5 min
Costs (shift 1):	\$943.19	\$919.19	\$929.96	\$925.99	\$943.23	\$911.29	\$863.08	\$934.00	\$926.54
Costs (shift 2):	\$776.57	\$756.98	\$765.87	\$762.65	\$777.01	\$750.55	\$712.31	\$769.87	\$763.85
Costs (shift 3):	\$406.64	\$396.52	\$401.19	\$399.54	\$407.19	\$393.20	\$374.36	\$403.82	\$400.78
CPU, total:	5156 sec	4987 sec	5009 sec	4995 sec	5020 sec	4898 sec	3940 sec	3915 sec	3778 sec
CPU, virtual:	3392 sec	3243 sec	3274 sec	3243 sec	3246 sec	3190 sec	2492 sec	2440 sec	2380 sec
CPU, good (1):	3284 sec	3167 sec	3166 sec	3154 sec	3160 sec	3130 sec	2462 sec	2380 sec	2324 sec
Memory Units:	36698	36054	36508	36428	37372	35858	36414	37770	37703
Page Faults:	508680	505394	496869	510575	511696	497047	484905	500118	492098
tfm meters:									
Page Faults:	26.85%	27.39%	26.98%	27.40%	27.76%	27.43%	29.47%	30.35%	30.00%
Getwork:	2.91%	2.87%	2.89%	2.93%	2.93%	2.94%	2.75%	2.90%	2.78%
Seg Faults:	2.82%	2.69%	2.76%	2.69%	2.67%	2.57%	2.31%	2.63%	2.58%
Bound Faults:	0.50%	0.47%	0.46%	0.46%	0.47%	0.47%	0.44%	0.44%	0.46%
Interrupts:	4.05%	4.16%	4.27%	4.15%	4.21%	3.99%	3.98%	3.96%	3.88%
Idle, zero:	0.32%	0.15%	0.33%	0.11%	0.00%	0.21%	0.20%	0.10%	0.20%
Idle, MP:	2.79%	3.18%	3.66%	3.73%	3.04%	3.07%	2.93%	3.00%	2.49%
Idle, NMP:	0.03%	0.02%	0.01%	0.03%	0.00%	0.04%	0.04%	0.01%	0.08%
Idle, Loading:	0.22%	0.25%	0.24%	0.24%	0.22%	0.19%	0.17%	0.17%	0.17%
Idle, total:	3.36%	3.60%	4.24%	4.11%	3.26%	3.54%	3.34%	3.28%	2.94%
Other (good):	59.51%	58.82%	58.40%	58.27%	58.71%	59.10%	57.71%	56.43%	57.36%
dvm meters:									
Bulk Reads:	512102	512313	499611	514747	515768	502558	492914	508012	498584
Bulk Writes:	288574	287760	283477	289628	287468	282344	263217	271116	265084
Bulk ATB I/O:	6.897	6.732	6.924	6.735	6.706	6.750	5.646	5.418	5.309
Bulk Avg. Page Wait:	0.567	0.565	0.565	0.568	0.567	0.566	0.549	0.548	0.543
D191 Reads:	53676	53951	52653	55150	55029	51941	45087	44359	42593
D191 Writes:	49605	49704	47726	49852	49995	47693	41062	41164	38979
D191 ATB I/O:	53.475	51.963	54.021	51.601	51.289	53.177	49.562	49.365	49.705
D191 Avg. Page Wait:	40.857	42.997	42.595	44.009	39.760	40.543	41.276	45.819	43.020

Notes:

(1) Based on Elapsed Time * percentage good (tfm meters)

Timing Comparisons for 24.7, 24.8, 24.8a, 25.0, 25.1, 25.2

System:	24.7	24.8	24.8	24.8a	25.0	25.0	25.1a	25.1a	25.2
Date:	02/03/75	02/10/75	02/15/75	02/27/75	03/06/75	03/06/75	03/08/75	03/10/75	03/13/75
Script:	script2	script2	script2	script2	script2	script2	script2	script2	script2
Write-through status:	none	none	none	none	none	none	none	none	none
Device Checking:	1	1	1	1	1	1	1	1	1
SYST:	2	2	2	2	2	2	2	2	2
CPU:	A	B*	A	B	B	A	A	B	A
Cache	on	on	on	on	on	on	on	on	on
Memories:	A,B	A,B	A,B	A,B	A,B	A,B	A,B	A,B	A,B
External Interlace:	off	off	off	off	off	off	off	off	off
Paging Device Size:	2048K	2048K	2048K	2048K	2048K	2048K	2048K	2048K	2048K
Disk Channels:	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8
Elapsed Time:	67.5 min	69.2 min	70.3 min	69.3 min	68.7 min	69.6 min	68.5 min	68.8 min	68.0 min
Costs (shift 1):	\$926.54	\$361.56	\$956.10	\$938.12	\$929.60	\$941.21	\$937.85	\$937.81	\$936.12
Costs (shift 2):	\$763.85	\$793.02	\$788.47	\$773.51	\$766.58	\$776.27	\$773.48	\$773.44	\$772.04
Costs (shift 3):	\$400.78	\$16.32	\$413.90	\$405.94	\$402.38	\$407.54	\$406.08	\$406.04	\$405.31
CPU, total:	3778 sec	3829 sec	3879 sec	3668 sec	3642 sec	3668 sec	3619 sec	3647 sec	3609 sec
CPU, virtual:	2380 sec	2385 sec	2385 sec	2375 sec	2328 sec	2327 sec	2321 sec	2324 sec	2321 sec
CPU, good (1):	2324 sec	2327 sec	2340 sec	2298 sec	2251 sec	2253 sec	2226 sec	2234 sec	2236 sec
Memory Units:	37703	33621	39317	38371	38172	38825	38673	38649	38576
Page Faults:	492098	508187	525374	466547	462846	466703	463635	466746	461868
t/m meters:									
Page Faults:	30.00%	30.56%	31.04%	27.66%	28.63%	28.80%	28.12%	28.52%	27.96%
Getwork:	2.78%	2.77%	2.83%	2.62%	2.55%	2.60%	2.59%	2.61%	2.59%
Seg Faults:	2.58%	2.56%	2.51%	2.51%	2.46%	2.48%	2.51%	2.54%	2.54%
Bound Faults:	0.46%	0.46%	0.43%	0.46%	0.44%	0.44%	0.46%	0.44%	0.45%
Interrupts:	3.88%	3.88%	3.99%	3.59%	3.52%	3.75%	3.71%	3.66%	3.64%
Idle, zero:	0.20%	0.19%	0.14%	0.13%	0.11%	0.32%	0.66%	0.25%	0.38%
Idle, MP:	2.49%	3.32%	3.33%	7.37%	7.18%	7.25%	7.41%	7.41%	7.15%
Idle, NMP:	0.08%	0.02%	0.04%	0.05%	0.08%	0.06%	0.05%	0.09%	0.07%
Idle, Loading:	0.17%	0.20%	0.22%	0.34%	0.44%	0.30%	0.31%	0.33%	0.43%
Idle, total:	2.94%	3.73%	3.73%	7.61%	7.81%	7.93%	8.43%	8.08%	8.03%
Other (good):	57.36%	56.06%	55.47%	55.28%	54.58%	54.00%	54.18%	54.15%	54.80%
dvm meters:									
Bulk Reads:	498584	515820	535249	472452	467743	472844	466794	469529	464995
Bulk Writes:	265084	272145	281733	250886	240961	243076	243540	243639	238646
Bulk ATB I/O:	5.309	5.274	5.167	5.752	5.825	5.833	5.790	5.790	5.802
Bulk Avg. Page Wait:	0.543	0.544	0.544	0.544	0.551	0.550	0.550	0.551	0.549
D191 Reads:	42593	44414	47510	44923	41698	44149	44621	44428	42397
D191 Writes:	38979	40552	43156	41754	38540	40837	40623	40555	39749
D191 ATB I/O:	49.705	48.917	46.563	48.002	51.449	49.144	48.249	48.589	49.701
D191 Avg. Page Wait:	43.020	43.694	45.935	42.929	40.593	41.388	41.084	42.589	40.331

Notes:

(1) Based on Elapsed Time * percentage good (t/m meters)

(2) Note that runs made after 02/15/75 were done with new scheduling parameters:
 wsf=.7; tfmax=4; ocore=.25; steh=1; tforce=1; atws=on; post_purge=on; telast=2