

MPM122
 4/23/71
 # users = 49
 MFTN3
 15.2x

***** MULTICS PERFORMANCE ANALYSIS *****

USER NO	COMMAND	TIME	CPU TIME	NO OF P.F.
0	login	1429	3.281	4 + 33
	edm	1433	4.363	108 + 189
	fortran	1440	5.321	11 + 233
	edm	1444	2.520	47 + 130
	fortran	1445	4.630	7 + 225
	rename	1446	1.262	2 + 43
	print	1446	1.157	2 + 46
	a_prime\$prime	1448	2.968	3 + 137
	list	1448	.742	2 + 32
	df	1449	1.420	2 + 64
	edm	1458	4.996	94 + 281
	fortran	1459	4.426	6 + 215
	edm	1504	2.776	27 + 171
	fortran	1505	3.829	2 + 243
	rename	1506	.592	1 + 26
	print	1506	.843	2 + 36
	b_prime\$prime	1508	1.990	12 + 82
	list	1508	.664	2 + 41
	df	1509	1.128	3 + 40
	logout			+

384 K core
 2 CPUs

***** SUMMARY *****

USER NO	TOTAL CPU TIME	TOTAL REAL TIME	TOTAL NO OF P.F.	NO OF INTER-ACTIONS	AVERAGE CPU TIME	AVERAGE RESPONSE TIME	AVERAGE NO OF P.F.
USER 0	45.532	2336	333 + 2224	66	.689	6.6 (3.5)	5 + 33

***** #users

(24.383	1146	184 + 1089	33	.737	6.3 (3.4)	5 + 33	48 first half
	21.149	1157	149 + 1135	33	.641	6.9 (3.5)	4 + 34	49 second half

↑
except fortran

The total CPU time required to run the script and the response time have become noticeably shortened.

Total metering time 0:18:37

Ave queue length	10.49	}
Ave eligible	5.90	
Working-set factor	.50	
Working-set addend	0	
Te first (seconds)	2	
Te last (seconds)	2	
Ti max (seconds)	3	

IDLE TYPE	TIME	%	
Total idle	0:03:52	10.42	} ← <u>less idle time</u>
Multi-prog idle	0:03:08	8.43	
Loading idle	0:00:23	1.26	
Non-multi-prog idle	0:00:16	.73	
Zero idle	0:00:00	0.00	

COUNTER	TOTAL	ATB	#/INT
Interactions	293	3.813 sec	
Loadings	2437	.458 sec	8.317
Blocks	1636	.683 sec	
Wakeups	1633	.684 sec	
Waits	70327	15.887 msec	240.024
Notifies	179965	6.209 msec	
Schedulings	2209	.506 sec	7.539
Pre-empts	67940	16.446 msec	231.977

Time	%Int	%Cum	Ave	%T	%CumT
0.0	68	68	.235	26	26
.5	17	85	.721	20	46
1.0	6	91	1.265	12	58
1.5	3	94	1.842	9	67
2.0	2	96	2.317	7	74
2.5	1	97	2.854	4	78
3.0	1	98	3.415	3	81
3.5	0	98	3.851	3	84
4.0	0	99	4.506	3	87
4.5	0	99	5.034	1	88
5.0	0	99	5.277	1	88
5.5	0	99	5.887	1	89
6.0	0	99	6.667	2	90
6.5	0	99	6.816	0	90
7.0	0	99	7.626	2	92
7.5	1	100	8.088	-1	100

DEPTH	%PF	TBPF	%GTW	TBS	%CPU
1	19.0	32.4	16.7	21.9	21.5
2	19.8	38.3	17.6	25.6	26.4
3	19.4	31.1	19.9	17.9	21.2
4	17.8	24.1	19.3	13.1	15.1
5	15.3	20.0	16.7	10.8	10.9
6	11.7	18.6	12.8	10.0	7.8
7	.5	0.0	.5	0.0	.5

MTBPF = 30.1 msec

The 14. system of the same configuration gave 27.3 msec MTBPF. Therefore, the MTBPF was lengthened by about 10%. This actually caused less idle time.

hau

Multics 15.2x, load 51.5/51.0; 50 users

r 1453 .224 4+5

fsm -all

Total metering time 0:23:10

	#	ATB		
Deactivations	3484	.399	sec.	
Seg Faults	4996	.273	sec.	
Bound Faults	253	5.495	sec.	
Setfaults (all)	9640	144.216	msec.	
Setfaults (acc)	160	8.689	sec.	
Updates	5027	276.555	msec.	
Steps	13800	100.742	msec.	
Skips (ehs)	5426	.256	sec.	
Skips (inf)	1077	1.291	sec.	
Skips (level)	3481	.399	sec.	
Skips (init)	0	0.000	sec.	
Skips (ring)	40	34.756	sec.	
Skips (lock)	27	51.490	sec.	
Skips (rc)	5	278.048	sec.	
AST Sizes	4	16	64	64
Number	539	140	75	0
Need	1412	1599	733	0
Steps	2329	5077	5959	0
Ave Steps	1.6	3.2	8.1	0.0
Grace (sec)	321.7	38.3	17.5	0.0

new data

	#	ATB	
Needs	110732	12.555	msec.
Ceiling	2065	.011	min.
Laps	1132	1.228	sec.
Steps	412918	3.367	msec.
Skip wired	4209	330.302	msec.
Skip used	241522	5.756	msec.
Skip mod	44849	30.998	msec.
Skip os	11606	119.786	msec.

327
3.6
6.7

316 pages, 34 wired.

Average steps 3.729

	DRUM	DSU270	DSU170
Left	346	11586	6407
Reads	94393	11725	942
ATB	14.723	118.571	1475.840
Writes	58874	8626	235
ATB	23.614	161.169	5915.920
ATB I/O	9.071	68.313	1181.174
% Cccty	22	77	7
Ave Latency	22.981	97.771	103.545
N Errors	0	0	2

← pretty long

r 1454 2.112 7+30

hnu

Multics 15.2x, load 51.5/51.0; 50 users

r 1455 .449 4+30

ttm -all

Total metering time 0:25:25

	%	AVE	
Page Faults	12.43	3904.395	
Drum interrupts	5.98	2216.813	} decreased
Getwork	7.08	1083.051	
Ser Faults	3.50	19417.817	
Bound Faults	.45	49085.795	
Interrupts	5.19	4152.484	
Gate faults	3.37	3670.000	
MP Idle	8.61		} decreased
Loading idle	1.34		
MMP Idle	.54		
Zero idle	0.00		
Other	51.51		← increased

r 1456 1.643 5+60

From Multics: Standby user preemption.
You will be logged out in three minutes.

ppmt -all

Total metering time 0:25:55

Working-set factor	.50	
Working-set addend	0	
Min-eligible	2	
Max-eligible	6	
% bad pre-paging	26.06	
Drum faults/pre-paging	2.61	
% drum priority moves	13.86	
% misses	9.44	
Ave post size	19.15	
Ave purge size	8.24	
% purged	45.38	
Ave pre size	10.98	
Ave pre-pagings	6.38	
% pre-paged	58.07	
Thrashing percentage	2.75	← very low
Ave post in core	14.29	
Ave working-set size	6.64	
Ave used in quantum	15.30	
Pre-page time	18.56	
Post-purge time	15.51	
Calls	3047	

r 1457 1.027 2+24

pcd

```

cru b 5
cru a 4
aioc a 2 0 7 11 13
mem c 200 on
mem e 200 on
mem d 200 on
clock b 1 25 est 5
drum 0 7700 1 4 5 6
d270 0 60650 a 27 10. 50607101112 13141516
d170 0 105340 a 37 9. 102030405 607
part mult 0 7700 0 57650 0 104540 0 0
part dump 0 0 0 0 104540 577 0 0
part salv 0 0 57650 1000 0 0 0 0
int 27 30 31 32 37
opds 11 1000.
schd 400000 20 20 100
sst 16. 539. 140. 75. 0.
ttyb 5
tty a 60 3 1200.
tty a 70 3 1200.
tty a 100 32. 133.
tty a 200 32. 133.
tty a 300 24. 150.
tty a 400 14. 110.
intk 77 mult

```

} 2 CPU's
 } 384 K core

r 1458 2.051 6+37

hmu
tcq

Multics 15.2x, load 52.5/51.0; 51 users

r 1459 .442 4+22

tcq -albad x[|+5

avg = 11, elapsed time = 1 sec, 23 active last 15 sec.

flags	tu	dtu	te	ts	ti	tssc	event	d	ws	process
MLERI	55	55	704	0	2167	.207	0 0	6		Sekino
WLETI	1013	1018	899	0	0	-.003	0 0	1		initializer
LEI	77	77	800	0	0	.036	32747 2	10		Schell
WLEI	189	190	340	2003	2000	.062	30336 2	4		Abramson
LEI	186	186	261	0	0	.001	24767 2	5		Thurber
PLERI	373	374	133	0	0	-.001	0 0	11		Bruce
W	172	173	0	0	0	.908	0 0	1		Snyder
	157	158	21	2019	2000	.699	0 0	9		Lema
	20	21	16	0	2017	1.303	0 0	6		Barnes

Automatic logout

Sekino Multics logged out 04/23/71 1459.8 est Fri

CPU usage 56 sec

hangup

Data Base Lockout Metering

(seg 5 = sst --- page table lock)
(seg 72 = tc-data --- traffic controller lock)

rzd 5 161 2
161 000005733716 000347274402
r 1432 1.120 4+63

rzd 72 36 2
36 000013602540 000026067422
r 1433 .359 7+19

rzd 5 161 2
161 000006235617 000370513506
r 1442 .470 2+34

rzd 72 36 2
36 000014352365 000030303022
r 1443 .435 3+23

rzd 5 161 2
161 000006511302 000415721373
r 1452 .489 2+34

rzd 72 36 2
36 000015137353 000032676432
r 1453 .395 3+24

rzd 5 161 2
161 000006770374 000444760243
r 1502 1.333 5+65

rzd 72 36 2
36 000015715761 000035304333
r 1503 .501 2+28

rzd 5 161 2
161 000007252634 000466746717
r 1512 .577 5+44

rzd 72 36 2
36 000016521271 000040031144
r 1513 .366 5+25

Roughly speaking, 100 msec. out of
1 second is lost because of page table
lockout. This means 10% of
one processor's capacity (5% of
the system). The loss due to
traffic controller lockout is very
small (~6 msec out of 1 second).