

MPM131
 7/14/71
 # users = 52
 MFTN3
 15.14

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

USER NO	COMMAND	TIME	CPU TIME	NO OF P.F.
0	login	1501	11.627	37 + 366
	edm	1510	5.370	67 + 315
	fortran	1511	5.744	6 + 262
	edm	1516	2.662	45 + 141
	fortran	1517	4.418	9 + 222
	rename	1518	.841	5 + 39
	rprint	1519	1.258	1 + 51
	a_prime\$prime	1520	3.090	9 + 142
	list	1520	.792	1 + 31
	df	1521	1.625	2 + 58
	edm	1530	4.773	77 + 285
	fortran	1531	3.814	4 + 190
	edm	1536	2.428	41 + 131
	fortran	1537	3.832	5 + 191
	rename	1537	.508	1 + 32
	rprint	1538	.674	2 + 23
	b_prime\$prime	1539	2.064	4 + 84
	list	1540	.537	2 + 29
	df	1541	1.052	3 + 38
	logout			+

384 K core
 2 CPUs
 2 DS270 channels
 interleaved memory

***** 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	45.273	2341	284 + 2264	66	.685	6.7 (3.5)	4 + 34

*****#users

(25.700	1167	145 + 1261	33	.778	7.5 (3.7)	4 + 38	52 first half
	19.573	1142	139 + 1003	33	.593	5.9 (3.3)	4 + 31	52 second half

↑ except "fortran"

The result is very similar to that of MPM130.

tcn -all

Total metering time 0:36:05

Ave queue length	10.27	} ←
Ave eligible	5.72	
Working-set factor	.50	
Working-set addend	0	
Tc first (seconds)	2	
Tc last (seconds)	2	
Ti max (seconds)	8	

IDLE TYPE	TIME	%	
Total idle	0:11:35	16.05	
Multi-prog idle	0:10:10	14.09	← larger than usual
Loading idle	0:01:13	1.89	
Non-multi-prog idle	0:00:11	.27	← almost saturated
Zero idle	0:00:00	0.00	

COUNTER	TOTAL	ATB	#/INT
Interactions	631	3.432 sec	
Loadings	4512	.430 sec	7.151
Blocks	3329	.651 sec	
Wakeups	3330	.650 sec	
Waits	141072	15.353 msec	223.569
Notifies	379056	5.714 msec	
Schedulings	4054	.534 sec	6.425
Pre-empts	147849	14.649 msec	234.309

Time	%Int	%Cum	Ave	%T	%CumT
0.0	43	43	.270	32	32
.5	13	56	.742	27	59
1.0	5	62	1.291	19	78
1.5	3	65	1.650	17	95
2.0	2	67	2.387	12	107
2.5	1	67	2.922	6	113
3.0	0	68	3.360	4	116
3.5	0	68	3.927	2	118
4.0	0	68	4.400	2	120
4.5	0	68	5.012	2	122
5.0	0	69	5.406	3	124
5.5	0	69	5.917	2	126
6.0	0	69	6.759	0	126
6.5	0	69	7.056	1	128
7.0	31	100	7.341	624	752
7.5	0	100	8.113	-662	100

DEPTH	%PF	TBRF	%TW	TBS	%CPU
1	18.7	29.9	17.1	19.3	21.6
2	19.0	32.6	17.9	20.9	23.9
3	18.6	27.7	19.5	16.0	20.0
4	17.5	22.9	18.6	12.9	15.6
5	15.3	20.4	16.9	11.5	12.6
6	13.4	17.6	13.2	10.7	9.3
7	.5	0.0	.5	0.0	.5

r 1536 2.548 22+21

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Multics 15.14, load 53.5/54.0: 52 users

r 1538 .321 1+25

psw -all

Total metering time 0:38:07

	#	ATB		
Deactivations	9305	.246	sec.	
Sec Faults	11947	.191	sec.	
Bound Faults	305	7.500	sec.	
Secfaults (all)	24398	93.763	msec.	
Secfaults (acc)	236	9.593	sec.	
Updates	11597	197.245	msec.	
Steps	30097	76.002	msec.	
Skips (ens)	7841	.292	sec.	
Skips (inf)	7944	.228	sec.	
Skips (level)	4491	.509	sec.	
Skips (init)	0	0.000	sec.	
Skips (ring)	30	76.248	sec.	
Skips (lock)	131	17.461	sec.	
Skips (no)	13	175.957	sec.	
ASZ Sizes	4	16	64	64
Number	408	160	90	0
Need	6998	1910	739	0
Steps	22971	3970	2518	0
Ave Steps	3.3	2.0	3.4	0.0
Grace (sec)	40.6	94.6	31.8	0.0

	#	ATB		
Needs	186520	12.264	msec.	
Ceiling	1146	.033	min.	
Lans	1861	1.229	sec.	
Steps	685951	3.335	msec.	
Skip wired	6852	333.836	msec.	
Skip used	402972	5.676	msec.	
Skip mod	74575	30.673	msec.	
Skip os	15032	152.172	msec.	

315 pages, 38 wired.
Average steps 3.678

	DRUM	DSU270	DSU170
Left	727	6981	5775
Reads	152893	27395	1146
ATB	14.962	83.529	19;6.026
Writes	99979	17500	252
ATB	22.879	130.711	9077.166
ATR I/O	9.046	50.962	1636.227
% Cncty	23	103	5
Ave Latency	23.098	87.878	87.432
W Errors	0	0	2

r 1538 2.576 9+31

hmu;ttm -all

Multics 15.14, load 54.5/54.0; 53 users

Total metering time 0:41:30

	%	AVN
Page Faults	11.50	3610.039
Drum interrupts	5.29	2056.377
Network	7.78	1119.157
Sec. Faults	5.34	20151.428
Round Faults	.33	47783.065
Interrupts	7.23	3665.897
Gate faults	3.24	3670.000
MP Idle	13.19	
Loading idle	1.60	
MP Idle	1.88	
Zero idle	.04	
Other	42.61	

$$\rightarrow \text{mtbpf (in process time)} = \frac{3.610}{0.115} \times 0.8329 = 26.2 \text{ msec}$$
This number is shorter than usual.

16.71 %

r 1540 1.804 7+53

ppat -all:intw2 -all

Total metering time 0:41:59

Working-set factor	.50
Working-set addend	0
Min-eligible	2
Max-eligible	6
% had pre-paging	22.75
Drum faults/pre-paging	1.93
% drum priority moves	15.18
% misses	6.58
Ave post size	24.65
Ave purge size	10.00
% purged	40.56
Ave pre size	14.45
Ave pre-pagings	7.38
% pre-paged	51.07
Thrashing percentage	4.18
Ave post in core	19.16
Ave working-set size	9.43
Ave used in quantum	21.38
Pre-page time	18.21
Post-purge time	17.21
Calls	4732

Total metering time 0:42:35

	ATB lock	loop %	loop time
ntl	6.0 ms.	3.97	.478 ms.
tcl	3.0 ms.	.41	.025 ms.

all locks 4.38 ← out of 100 % CPU capacity

r 1541 1.966 10+65

ncd

```

cpu a 4
cpu b 5
}
nice a 2 0 7 11 13 } 2 CPUs 4 384 Kmem
mem c 200 on
mem d 200 on
mem e 200 on

```

```

clock a 0 25 edt 4
drum c 2700 1 4 5 6
d170 0 105340 a 37 8. 102030405 607
d270 0 60850 a 27 10. 401130214 3151216
part mult 0 7700 0 57650 0 104340 0 0
part saly 0 0 57650 1000 0 0 0 0
part dump 0 0 0 104340 1000 0 0
schd 400000 20 20 100
set 16. 408. 160. 90. 0.
int 27 30 31 32 37
prio 9. 250. 1000.
ttvb 5
tty a 60 3 1200.
tty e 20 3 1200.
tty a 100 32. 133.
tty a 200 32. 133.
tty a 400 14. 110.
tty a 300 24. 150.
tcd 5 75. 150. 130.
inrk 77 mult

```

r 1542 1.731 5+30

hmu

Multics 15.14, load 53.5/54.0; 52 users

r 1542 .188 2+7

TPM

```

total metering time 3.77 hr, .16773972e+03 terminal hr
min output buffer 401 chars, 26 sec.
ave output buffer 915 chars, 61 sec.
ATB output blocks 23 1048 sec.
ATB status .154 6.834 sec.
% status queued 3.6%
ATP quit 16.5 734.6 sec.
ATP dialups 50.2 2236.5 sec.
ATP cycle 1.3 56.7 sec.
output buffer eff. 97%
ave interrupt time 4.386 ms. 3.0%
max interrupt time 321.602 ms.

```

	total	1050	2741	*37	T300	ARDS	2741	M35
cur # dialed	54	1	39	11	0	3	0	0
ave # dialed	44.5	1.5	31.1	9.8	.1	1.4	.1	.6
input rate	2.3	.2	.3	.1	.2	.5	.8	.1
output rate	83.6	3.7	4.0	3.5	14.3	8.5	48.1	1.5
r 1543	1.431	6+46						

hmu

Multics 15.14, load 52.5/54.0; 51 users

r 1543 .270 4+13

rzd scs 245
245 000001100110
r 1544 .331 5+19

interlaced memory

rzd scs 201
201 000000000002
r 1544 .300 6+16

da -d270

Connects = 156732, 44608.

P RW D CORE

O W 1 13760
O W 1 4420

r 1544 .429 5+13

da -d270

Connects = 156916, 44654.

P RW D CORE

1 P 1 2700
O W 1 13420
O W 1 4000

r 1544 .416 5+11

*Two DS270 channels
are in operation*

top

avg = 6, elapsed time = 887 sec, 18 active last 15 sec.

flags	tu	dtu	te	ts	ti	tssc	event	d	ws	process
VLRI	82	125	504	0	0	.105	0 0		3	Sekino
LRI	108	20	215	0	0	-.013	0 0		18	Sorrentino
LRI	29	29	270	2000	2000	.004	24175 2		23	Frost
LRI	180	37	403	0	2000	-.012	0 0		3	WCarlson
LRI	28	19	81	2004	6205	.114	0 0		10	Harrington
W	50	10	0	0	0	.509	0 0		8	Veza
W	834	95	0	0	0	.384	0 0		9	IO
	21	21	13	2001	8000	11.626	0 0		4	Green

r 1545 1.569 3+58

logout

Sekino Multics logged out 07/14/71 1545.9 edt Wed
CPU usage 1 min 24 sec
hangup