MPM133
8/30/71
users = 47
MFTN3
15.17e

384 K core
2 CPUs
2 DS270 channels
interlaced memory

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

USER NO	COMMAND	TIME	CPU TIME	NO OF P.F.
0	login	1547	2.263	0 + 69
	edm	1556	4.478	58 + 249
	fortran	1557	4.590	2 + 210
	edm	1602	1.703	57 + 80
	fortran	1602	4.445	1 + 182
	rename	1603	.622	5 + 38
	print	1603	.671	5 + 28
	a_prime&prime	1605	1.[illegible]	20 + 61
	list	1606	.616	6 + 30
	df	1606	1.329	6 + 41
	edm	1615	3.492	124 + 172
	fortran	1616	3.106	7 + 152
	edm	1621	2.215	69 + 97
	fortran	1621	1.349	6 + 251
	rename	1622	.701	4 + 18
	print	1623	.716	5 + 31
	b_prime&prime	1624	1.650	20 + 49
	list	1625	.442	6 + 25
	df	1625	.874	5 + 33
	logout			+

********** SUMMARY **********

USER NO	TOTAL CPU TIME	TOTAL REAL TIME	TOTAL NO OF P.F.	NO OF INTER-ACTIONS	AVERAGE CPU TIME	AVERAGE RESPONSE TIME	AVERAG NO OF P.F.
[illegible]	37.028	2242	400 + 1747	66	.671	3.1 (2.0)	8+ 32

********** # users

20.789	1106	160 + 919	33	.630	3.2 (2.4)	4 + 27	46 first half
17.137	1103	248 + 828	33	.519	2.9 (1.7)	7 + 25	47 second half

↑ except "fortran"

Note: The CPU usage of each command was significantly smaller than the values observed before presumably because of the lesser degree of thrashing [illegible]

tom -all

Total metering time 0:70:40

Ave queue length	3.17 *+1 = 4.17*	*← very short*
Ave eligible	3.83	
Working-set factor	.50	
Working-set addend	0	
Te first (seconds)	2	
Te last (seconds)	2	
Ti max (seconds)	8	

IDLE TYPE	TIME	%	
Total idle	0:22:09	36.10	
Multi-prog idle	0:03:21	5.47	
Loading idle	0:00:11	*(*.31*)*	
Non-multi-prog idle	0:16:06	26.24	*← not saturated*
Zero idle	0:02:30	4.08	

COUNTER	TOTAL	ATB	#/INT
Interactions	1253	1.469 sec	
Loadings	3937	.468 sec	3.142
Blocks	3329	.553 sec	
Wakeups	3415	.539 sec	
Waits	69342	26.540 msec	55.341
Notifies	225595	8.161 msec	
Schedulings	3772	.488 sec	3.010
Pre-empts	95448	19.289 msec	76.176

Time	%Int	%Cum	Ave	%T	%CumT
0.0	67	67	.175	79	79
.5	8	75	.731	40	119
1.0	3	78	1.283	27	146
1.5	2	79	1.860	20	167
2.0	1	80	2.310	9	175
2.5	1	80	2.856	11	186
3.0	0	81	3.449	9	195
3.5	0	81	3.979	6	201
4.0	0	81	4.446	8	209
4.5	0	81	4.986	7	216
5.0	0	82	5.430	6	222
5.5	0	82	5.895	2	225
6.0	0	82	6.760	1	226
6.5	0	82	6.[illegible]	3	229
7.0	18	99	7.343	884	1112
7.5	1	100	8.134	-1043	100

DEPTH	%PF	TRPF	%CTW	TBS	%CPU
1	30.4	37.5	29.3	24.0	33.5
2	22.1	38.4	26.6	24.7	31.6
3	18.5	33.6	19.7	19.0	18.3
4	13.0	26.0	14.0	14.7	10.1
5	9.2	25.2	8.9	14.0	6.2
6	4.9	21.0	5.0	12.3	3.2
7	.5	0.0	.5	0.0	.5

hmu

Multics 15.17e, load 49.0/54.0; 48 users
Absentee users = 0; Max absentee users = 1

r 1624 .539 1+23

fsm -all

Total metering time   0:33:01

	#	ATB
Deactivations	4306	.460 sec.
Seg Faults	6502	.305 sec.
Bound Faults	221	8.967 sec.
Setfaults (all)	13470	147.119 msec.
Setfaults (acc)	244	8.122 sec.
Updates	5788	342.380 msec.
Steps	11931	166.096 msec.
Skips (ehs)	2663	.744 sec.
Skips (inf)	2986	.664 sec.
Skips (level)	1656	1.197 sec.
Skips (init)	0	0.000 sec.
Skips (ring)	6	330.283 sec.
Skips (lock)	31	63.926 sec.
Skips (pc)	5	396.339 sec.

AST Sizes	4	16	64	64
Number	1408	160	90	0
Need	3537	721	256	0
Steps	9457	1326	525	0
Ave Steps	2.7	1.7	2.1	0.0
Grace (sec)	185.5	239.1	339.7	0.0

	#	ATB
Needs	101871	19.453 msec.
Ceiling	8	4.129 min.
Laps	792	→ 2.502 sec.
Steps	318888	6.214 msec.
Skip wired	7779	254.749 msec.
Skip used	171553	11.551 msec.
Skip mod	31364	63.184 msec.
Skip os	6316	313.759 msec.

315 pages, 41 wired.
Average steps   3.130

	DRUM	DSU270	DSU170
Left	1869	1317	7889
Reads	91344	15488	1783
ATB	24.362	127.950	1111.439
Writes	66277	7802	230
ATB	29.900	253.928	8616.068
ATB I/O	13.424	85.088	934.449
# Qncty	15	(61)	8 ← low traffic density
→ Ave Latency	22.959	75.561	66.562
# Errors	-1	-6	0

(2)

r 1625 2.403 4+36

hmu

Multics 15.17e, load 45.0/54.0; 44 users
Absentee users = 0; Max absentee users = 1

r 1626 .383 2+17

itm -all;prmt -all;intm2 -all

Total metering time 0:35:39

	%	AVE
Page Faults	5.91	3210.524
Drum interrupts	2.08	1981.634
Network	5.54	1193.100
Seg Faults	2.24	13782.239
Bound Faults	.22	42502.204
Interrupts	5.41	3801.319
Gate faults	2.68	3670.000
MP Idle	5.06	
Loading idle	.30	38.34
RCP Idle	28.57	
Zero idle	4.41	
Other	36.77	

→ mtbpf (in process time) = $\frac{3,210}{0.0581} \times 0.6166 = 34.1$ msec.

Total metering time 0:35:33

Working-set factor	.50
Working-set addend	0
Min-eligible	2
Max-eligible	6
# bad pre-reqins	19.60
Drum faults/pre-reqins	.06
# drum priority moves	11.79
# misses	2.94
Ave post size	23.16
Ave purge size	10.80
# purged	46.64
Ave pre size	14.99
Ave pre-reqins	6.40
# pre-reqed	42.69
Thrashing percentage	3.10
Ave post in core	19.84
Ave working-set size	9.01
Ave used in quantum	20.23
Pre-purge time	13.64
Post-purge time	17.46
Calls	4166

Total metering time 0:36:46

	ATT lock	loop %	loop time
ntl	9.6 ms.	2.22	.426 ms.
tal	4.4 ms.	.23	.020 ms.
all locks		2.45	

← lower than usual

```
hmu

Multics 15.17a, load 46.0/54.0; 45 users
Absentee users = 0; Max absentee users = 1

r 1629 .301 4+17

pcd

cpu b 7
cpu a 6
iom a 2 6 7 11 13
drum 0 7700 1 4 5 6
mem c 200 on
mem d 200 on
mem e 200 on
clok b 1 25 alt 4
d170 0 105340 a 37 8. 100102030405 607
d270 0 60650 a 27 10. 1201130214 3150416
part mult 0 7700 0 57650 0 104340 0 0
part salv 0 0 57650 1000 0 0 0 0
part dump 0 0 0 0 104340 1000 0 0
sst 17. 408. 160. 90. 0.
schd 400000 20 20 100
intr 27 30 31 32 37
rnds 9. 350. 1000.
ttyb 5
tty a 60 3 1200.
tty c 70 3 1200.
tty a 100 32. 133.
tty c 200 32. 133.
tty a 400 14. 110.
tty a 300 24. 150.
tcd 5 75. 150. 130.
intk 77 mult
```

2 CPUs + 384 Kcore

```
r 1629 1.654 5+12

ttym
total metering time 7.46 hr, .27906194e+03 terminal hr
min output buffer 384 chars, 25 sec.
ave output buffer 1060 chars, 70 sec.
ATT output blocks 29 1111 sec.
ATT status .188 7.051 sec.
# status queued 2.7%
ATT quit 34.4 1288.0 sec.
ATT dialups 111.4 4169.6 sec.
ATT cycle 1.7 64.0 sec.
output buffer eff. 85%
ave interrupt time 4.680 ms. 2.8%
max interrupt time 252.204 ms.
```

	total	1050	2741	M37	T300	ARDS	2741	M35
cur # dialed	48	3	27	11	1	1	4	1
ave # dialed	37.4	2.7	23.1	8.3	.4	1.2	1.0	.6
input rate	2.6	.4	.3	.2	.2	.7	.4	.2
output rate	45.7	3.7	4.2	4.1	11.1	14.0	5.0	3.6

```
r 1629 1.704 3+35
```

```
r26 sca 245
   245  000001100110
r 1630  .394  3+22

r26 sca 201
   201  000000000002
r 1630  .313  5+15

da -d270

Connects = 255607, 84573.

P  SW  P  CORE

0  M   3   11060
0  S   3   10120

r 1631  .648  5+40

da -d270

Connects = 255767, 84719.

P  SW  P  CORE

1  S   1    7220
1  S   3    4100
0  M   1    4200
0  S   1    6200
0  M   1   10100

r 1631  .436  6+15

tan
svc = 0, elapsed time = 836 sec, 18 active last 15 sec.
flags     tu dtu   te    ts    ti     tssc event d  ws process
XLDSI     71  19  640     0     0   -.001     0 0   7 Sekino
LDSI       8   8 1322     0     0    .536     0 0   9 RDavis
XLSI      19   9  847     0     0    .086     0 0  16 Sorrentino
XLSOI     56  27  411  2000  6006    .076     0 0  24 Wraning
XSI       25   9 1158  4002  8000    .119     0 0   9 Vezza
XSDI      52  52  653  6002  8000    .567     0 0  25 Zona
X       1348  60    0     0     0   2.086     0 0  15 initializer
        2868  30   55     0  8000   4.854     0 0  50 Backup
X         72  72   22     0 16000   5.878     0 0  18 Translator
r 1631  1.601  6+81

hnu

Multics 15.17e, load 49.0/54.0; 48 users
Absentee users = 0; Max absentee users = 1

r 1632  .491  5+13
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interlaced memory

← Two DS270 channels