

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

MPM 134  
11/17/71  
# users = 49  
MFTN3  
15.25b

USER NO	COMMAND	TIME	CPU TIME	NO OF P.F.
0	login	1613	3.562	3 + 112
	edm	1622	5.301	130 + 218
	fortran	1625	5.573	25 + 207
	edm	1628	2.787	33 + 127
	fortran	1629	7.295	35 + 287
	rename	1630	1.084	16 + 38
	print	1630	1.189	15 + 19
	a_prime@prime	1632	3.355	6 + 92
	list	1632	1.103	2 + 34
	if	1633	2.320	3 + 92
	edm	1642	5.389	40 + 297
	fortran	1644	4.306	34 + 218
	edm	1649	3.285	25 + 167
	fortran	1649	5.060	4 + 259
	rename	1650	.927	1 + 35
	print	1651	.860	1 + 29
	b_prime@prime	1652	2.348	15 + 78
	list	1653	.693	1 + 30
	df	1654	1.202	14 + 49
	logout			+

384 k core  
2 CPUs  
1 DS 270 channel  
non-interlaced 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	53.607	2384	308 + 2259	33	.812	6.0(3.9)	6 + 34

\*\*\*\*\* #users

(	29.547	1159	264 + 1044	33	.895	6.0(3.6)	8 + 33	49 first half
	24.060	1193	135 + 1165	33	.729	5.9(4.2)	4 + 35	50 second half

Because only one DS 270 channel is being used, the performance observed is very poor.

tcn -all

Total metering time 0:24:09

Ave queue length	14.08	← very long
Ave eligible	5.91	
Working-set factor	.50	
Working-set addend	0	
Te first (seconds)	1	
Te last (seconds)	2	
Ti max (seconds)	8	

IDLE TYPE	TIME	%	
Total idle	0:07:46	16.08	} heavily loaded
Multi-prog idle	0:06:59	14.49	
Loading idle	0:00:45	1.56	
Non-multi-prog idle	0:00:00	.03	
Zero idle	0:00:00	0.00	

COUNTER	TOTAL	4TP	#/INT
Interactions	470	3.087 sec	
Loadings	3242	.447 sec	6.898
Blocks	1937	.729 sec	
Wakeups	1966	.737 sec	
Waits	83311	17.333 msec	177.896
Notifies	218373	6.636 msec	
Schedulings	2339	.502 sec	6.147
Pre-empts	91752	15.794 msec	195.232

Time	%Int	%Cum	Ave	%T	%CumT	
0.0	46	46	.269	31	31	
.5	13	59	.761	25	56	
1.0	4	62	1.292	12	67	
1.5	3	65	1.628	13	80	
2.0	2	66	2.346	9	89	
2.5	1	67	2.953	4	93	
3.0	0	67	3.393	1	95	
3.5	0	67	3.920	3	98	
4.0	0	67	4.436	2	100	
4.5	0	67	4.981	3	103	
5.0	0	68	5.518	4	107	
5.5	0	68	6.022	6	112	
6.0	0	68	6.561	1	114	
6.5	0	68	7.157	2	116	
7.0	31	99	7.341	577	693	← screwy
7.5	1	100	8.155	-600	100	

DEPRN	%PF	%RPF	%CTM	TBS	%CPU
1	13.4	24.1	17.4	15.2	15.7
2	12.2	34.4	16.9	22.3	21.5
3	13.2	35.5	13.2	21.1	22.1
4	17.3	29.4	13.9	13.4	17.3
5	13.4	25.1	17.2	14.3	14.2
6	14.2	24.6	14.5	14.4	12.1
7	.5	0.0	.5	0.0	.5

r 1335 2.963 10+43

mm

Multics 15.25h, load 50.5/54.0; 49 users  
Absence users 1/1

r 1637 1.025 1+20

fsm -all

Total metering time 0:26:35

	#	ATB		
Reactivations	4022		.307	sec.
Sec Faults	5505		.200	sec.
Found Faults	160		3.072	sec.
Setfaults (all)	11152		143.064	msec.
Setfaults (acc)	122		13.077	sec.
Updates	5165		302.207	msec.
Steps	11057		144.204	msec.
Skins (chs)	3272		.437	sec.
Skins (inf)	1732		.021	sec.
Skins (level)	1762		.005	sec.
Skins (init)	0		0.000	sec.
Skins (ring)	20		70.773	sec.
Skins (lock)	45		35.455	sec.
Skins (no)	4		302.933	sec.
ASB Sizes				
Number	4	16	64	64
Need	412	130	40	0
Step	2113	1070	421	0
Steps	3054	6184	647	0
Ave Steps	1.8	3.7	1.5	0.0
Grace (sec)	170.6	46.4	98.0	0.0

	#	ATB		
Needs	123137		13.053	msec.
Ceilings	8649		.003	min.
Leas	1132		1.409	sec.
Steps	421055		3.709	msec.
Skin wired	5305		295.729	msec.
Skin used	233046		6.220	msec.
Skin mod	30030		40.216	msec.
Skin os	20429		79.101	msec.

310 pages, 37 wired.

Average steps 3.446

	DRUM	DSU270	DSU170
Left	535	9190	9270
Reads	22779	19070	1800
ATB	18.152	87.328	961.117
Writes	63327	8487	817
ATB	25.104	137.000	1052.320
ATB I/O	2.042	57.036	644.107
Crcty	21	90	13
Ave Latency	22.930	123.482	77.554
N Errors	6	0	2

r 1638 3.720 22+44

← very big!

intm2 -all

Multics 15.25h, load 49.5/54.0; 49 users  
Absentee users 1/1

Total metering time 0:22:47

	#	AVE
Page Faults	19.23	6270.555
Drum interrupts	7.17	3120.221
Getwork	8.46	1334.726
Sec Faults	2.06	17124.270
Bound Faults	.23	43762.424
Interrupts	6.60	3227.202
Gate faults	2.37	3670.000
MP Idle	14.24	
loading idle	1.64	
MP Idle	.02	
Zero idle	0.00	
Other	37.36	

← exceptionally long due to the unavailability of two DS270 channels

← very small

r 1630 2.216 2+22

intm2 -all;intm2 -all

Total metering time 0:29:33

Working-set factor	.50
Working-set addend	0
Min-eligible	2
Max-eligible	6
Bad pre-raging	28.12
True faults/pre-raging	1.50
Drum priority moves	11.07
Misses	6.42
Ave post size	29.42
Ave surge size	10.50
Surged	35.22
Ave pre size	15.65
Ave pre-ragings	7.20
Pre-raged	42.23
Thrashing percentage	5.04
Ave post in core	21.26
Ave working-set size	11.22
Ave used in quantum	25.42
Pre-rage time	26.39
Post-surge time	21.56
Calls	3528

Total metering time 0:29:32

ATR lock loop # loop time

tbl	6.8 ms.	8.93	1.221 ms.
tbl	3.4 ms.	.47	.032 ms.

← exceptionally big because of the above reason.

all locks 9.40

← twice bigger than usual

r 1641 1.987 3+66

hnu

Multics 15.25h, load 51.5/54.0; 50 users  
Absentee users 1/1

r 1641 .346 1+15

rcd

```

cpu b 7
cpu a 3
ploc 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 4032. 1 4 5 6
d170 0 48824. a 37 11. 101112130405 607030201
d270 0 25000. a 27 10. 51206130714 10151116
rart mult 0 4032. 0 24488. 0 48372. 0 0
rart saly 0 0 24488. 512. 0 0 0 0
rart durn 0 0 0 0 48372. 512. 0 0
set 13. 412. 190. 40. 0.
schd 400000 10 20 100
int 227 230 231 232 37
onds 8. 350. 1000.
ttyb 5
tty a 50 3 1200.
tty a 70 3 1200.
tty a 100 32. 133.
tty a 200 32. 133.
tty a 400 14. 110.
tty a 300 24. 150.
sed 5 75. 150. 130.
inlh 77 mult

```

} 2 CPUs & 384 kare

r 1642 2.831 15+41

ttvm

Segment ttvm not found.

r 1642 .619 2+31

ls -l

links= 9.

ttvm

>udd>n>w>install>ttvm

TTT

r 1643 1.275 15+40

hnu

Multics 15.25h, load 50.5/54.0; 49 users  
Absentee users 1/1

r 1643 .859 4+36

rzd ses 315

315 000001100100

r 1644 .616 1+30

↓ memory is not interleaved.

ds -d270

Connects = 325842, 0.

P	FW	T	CORN
1	R	3	11320
0	W	2	11720
0	W	2	6640
0	W	3	11260
0	W	2	10440
0	W	2	12360
0	W	2	12220
0	W	3	3740
0	W	3	12120
0	W	3	13040
0	W	3	10200
0	W	2	12020
0	W	2	11020

↑ we have only one DS270 channel.  
 This is degrading the system performance  
 very much.

r 1644 1.003 1+29

lcc

avg = 19, elapsed time = 0 sec, 19 active last 15 sec.

flags	tu	dtu	te	ts	ti	tssc	event	d	ws	process
LNRI	148	148	318	0	6457	.017	0	0	3	Tavares
PNLRTI	1544	1545	1559	0	0	-.004	0	0	24	initializer
PNLRTI	58	58	959	0	0	-.001	0	0	2	Sekino
PLFI	1749	1749	108	0	0	-.006	0	0	14	IO
IMI	22	23	61	0	1900	.004	0	0	1	Stone
NIPI	764	764	69	4002	3027	.018	0	0	17	Chanr
W	311	312	0	0	0	.191	0	0	8	Franklin
	72	72	46	6079	5215	.797	0	0	19	DRubin
	64	65	23	2000	7075	.584	0	0	10	Vellenga
	40	41	23	0	7240	17.972	0	0	12	Hill
W	920	921	20	2000	8000	196.760	0	0	12	Packup
W	22	23	48	0	8000	561.206	0	0	24	Peskin
	94	94	13	0	8000	314.960	0	0	10	Veza
	83	84	9	0	8000	303.554	0	0	4	Retriever
W	467	467	0	0	0	.13595228e+04	0	0	23	Translator
W	39	39	0	0	0	193.725	0	0	1	MSmith
W	328	329	5	0	8000	39.413	0	0	2	Godsell
W	133	134	14	0	8000	20.639	0	0	3	Garmen
	53	53	35	0	8000	5.694	0	0	24	Webber

r 1646 3.619 20+142

hmu

Multics 15.25h, load 53.5/54.0; 52 users  
Absentee users, 1/1

r 1648 .366 3+14