

MPM123

4/28/71

users = 40

MFTN3

15.4x

384 K core

1 CPU

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

| USER NO | COMMAND | TIME | CPU TIME | NO OF P.F. |
|---------|----------------|------|----------|------------|
| 0 | login | 1354 | 2.683 | 0 + 71 |
| | edm | 1403 | 3.797 | 169 + 143 |
| | fortran | 1404 | 4.504 | 57 + 197 |
| | edm | 1409 | 2.005 | 86 + 94 |
| | fortran | 1410 | 3.764 | 4 + 218 |
| | rename | 1411 | .828 | 6 + 28 |
| | print | 1411 | .912 | 4 + 47 |
| | a_prime\$prime | 1413 | 2.486 | 48 + 75 |
| | list | 1413 | .532 | 6 + 19 |
| | df | 1414 | 1.133 | 4 + 39 |
| | edm | 1423 | 2.719 | 175 + 95 |
| | fortran | 1424 | 3.222 | 21 + 180 |
| | edm | 1429 | 1.817 | 91 + 80 |
| | fortran | 1430 | 3.268 | 24 + 212 |
| | rename | 1431 | .543 | 6 + 30 |
| | print | 1432 | .615 | 6 + 23 |
| | b_prime\$prime | 1433 | 1.587 | 50 + 69 |
| | list | 1434 | .456 | 6 + 15 |
| | df | 1435 | .997 | 6 + 42 |
| | 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 | AVERAGE NO OF P.F. |
|---------|----------------|-----------------|------------------|---------------------|------------------|-----------------------|--------------------|
| USER 0 | 35.185 | 2414 | 769 + 1606 | 66 | .533 | 9.0 (5.6) | 11 + 24 |

| ***** #users | | | | | | | |
|--------------|--------|------|-----------|----|------|-----------|------------------------|
| (| 19.961 | 1183 | 384 + 860 | 33 | .605 | 8.6 (5.4) | 11 + 26 41 first half |
| | 15.224 | 1199 | 385 + 746 | 33 | .461 | 9.5 (5.9) | 11 + 22 39 second half |

↑
except "fortran"

This result should be compared with that of MPM115 (14.4x system). The differences between two results are found in the reduced CPU time and response time.

Total metering time 0:17:56

| | |
|--------------------|-------|
| Ave queue length | 12.54 |
| Ave eligible | 5.254 |
| 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 | 0:00:26 | 2.43 |
| Multi-prog idle | 0:00:19 | 1.83 |
| Loading idle | 0:00:06 | .60 |
| Non-multi-prog idle | 0:00:00 | 0.00 |
| Zero idle | 0:00:00 | 0.00 |

← very little idle time
(very similar to the result of MPM115)

| COUNTER | TOTAL | ATB | #/INT |
|--------------|--------|-------------|---------|
| Interactions | 167 | 6.448 sec | |
| Loadings | 1363 | .790 sec | 8.162 |
| Flocks | 1238 | .870 sec | |
| Wakeups | 1277 | .843 sec | |
| Waits | 31829 | 33.833 msec | 190.593 |
| Notifies | 108316 | 9.942 msec | |
| Schedulings | 1390 | .775 sec | 8.323 |
| Pre-empts | 21000 | 51.280 msec | 125.749 |

| Time | %Int | %Cum | Ave | %T | %CumT |
|------|------|------|-------|----|-------|
| 0.0 | 66 | 66 | .234 | 15 | 15 |
| .5 | 19 | 85 | .731 | 13 | 28 |
| 1.0 | 6 | 91 | 1.296 | 7 | 35 |
| 1.5 | 5 | 96 | 1.839 | 8 | 43 |
| 2.0 | 2 | 98 | 2.436 | 4 | 48 |
| 2.5 | 1 | 99 | 2.845 | 4 | 52 |
| 3.0 | 0 | 99 | 3.508 | 1 | 52 |
| 3.5 | 0 | 100 | 3.936 | 1 | 54 |
| 4.0 | 0 | 100 | 4.491 | 0 | 54 |
| 4.5 | 0 | 100 | 5.009 | 0 | 55 |
| 5.0 | 0 | 100 | 5.281 | 1 | 55 |
| 5.5 | 0 | 100 | 6.002 | 1 | 56 |
| 6.0 | 0 | 100 | 6.291 | 0 | 56 |
| 6.5 | 0 | 100 | 6.816 | 0 | 56 |
| 7.0 | 0 | 100 | 7.340 | 0 | 56 |
| 7.5 | 0 | 100 | 7.864 | 44 | 100 |

| DEPTH | %PF | TBPF | %GTW | TBS | %CPU |
|-------|------|------|------|------|------|
| 1 | 34.7 | 44.1 | 27.7 | 33.1 | 46.2 |
| 2 | 25.2 | 33.0 | 26.1 | 19.0 | 25.2 |
| 3 | 18.5 | 24.7 | 19.9 | 13.7 | 14.0 |
| 4 | 12.3 | 22.3 | 14.2 | 11.4 | 9.5 |
| 5 | 7.6 | 22.5 | 9.4 | 10.7 | 5.4 |
| 6 | 4.6 | 26.3 | 5.6 | 12.7 | 3.8 |
| 7 | .5 | 0.0 | .5 | 0.0 | .5 |

MTBPF = 35.1 msec.

r 1412 2.189 13+17

mmu

Multics 15.4x, load 41.5/41.0; 40 users

r 1416 .180 6+3

fsm -all

Total metering time 0:23:12

| | # | ATB | | |
|-----------------|-------|---------|-------|-----|
| Deactivations | 2150 | .648 | sec. | |
| Seg Faults | 2957 | .471 | sec. | |
| Bound Faults | 140 | 9.948 | sec. | |
| Setfaults (all) | 5862 | 237.595 | msec. | |
| Setfaults (acc) | 104 | 13.392 | sec. | |
| Updates | 2989 | 465.970 | msec. | |
| Steps | 5324 | 261.605 | msec. | |
| Skips (ehs) | 963 | 1.446 | sec. | |
| Skips (inf) | 1261 | 1.105 | sec. | |
| Skips (level) | 773 | 1.802 | sec. | |
| Skips (init) | 0 | 0.000 | sec. | |
| Skips (ring) | 8 | 174.098 | sec. | |
| Skips (lock) | 19 | 73.304 | sec. | |
| Skips (pc) | 6 | 232.131 | sec. | |
| AST Sizes | 4 | 16 | 64 | 64 |
| Number | 408 | 160 | 90 | 0 |
| Need | 1508 | 613 | 173 | 0 |
| Steps | 3580 | 1124 | 353 | 0 |
| Ave Steps | 2.4 | 1.8 | 2.0 | 0.0 |
| Grace (sec) | 158.7 | 198.3 | 355.1 | 0.0 |

| | # | ATB | |
|------------|--------|----------|-------|
| Needc | 67324 | 20.688 | msec. |
| Ceiling | 97 | .239 | min. |
| Laps | 296 | 4.705 | sec. |
| Steps | 139577 | 9.979 | msec. |
| Skip wired | 1024 | 1360.140 | msec. |
| Skip used | 59708 | 23.327 | msec. |
| Skip mod | 9035 | 154.154 | msec. |
| Skip os | 2486 | 560.251 | msec. |

316 pages, 27 wired.

Average steps 2.073

| | DRUM | DSU270 | DSU170 |
|-------------|--------|---------|----------|
| Left | 710 | 8129 | 8737 |
| Reads | 56478 | 7821 | 697 |
| ATB | 24.661 | 178.083 | 1998.255 |
| Writes | 36154 | 4688 | 281 |
| ATB | 38.524 | 297.095 | 4956.525 |
| ATB I/O | 15.036 | 111.343 | 1424.114 |
| % Cpctv | 13 | 47 | 6 |
| Ave Latency | 22.920 | 86.887 | 100.987 |
| N Errors | 0 | 0 | 4 |

r 1418 2.115 15+31

↑ increased

Multics 15.4x, load 40.5/41.0; 39 users

r 1418 .229 6+10

ttm -all

Total metering time 0:25:39

| | % | AVE |
|-----------------|-------|-----------|
| Page Faults | 6.29 | 2183.603 |
| Drum interrupts | 3.19 | 1348.114 |
| Getwork | 7.51 | 1471.443 |
| Seg Faults | 3.51 | 16734.816 |
| Round Faults | .43 | 43480.686 |
| Interrupts | 7.56 | 4084.115 |
| Gate faults | 4.15 | 3670.000 |
| MP Idle | 1.52 | |
| Loading idle | .54 | |
| NMP Idle | 0.00 | |
| Zero idle | 0.00 | |
| Other | 65.28 | |

very similar to the result of MPM115

r 1419 1.438 6+51

about 2/3

ppmt -all

Total metering time 0:25:52

| | |
|------------------------|-------|
| Working-set factor | .50 |
| Working-set addend | 0 |
| Min-eligible | 2 |
| Max-eligible | 6 |
| % bad pre-paging | 43.65 |
| Drum faults/pre-paging | .73 |
| % drum priority moves | 12.95 |
| % misses | 7.16 |
| Ave post size | 48.69 |
| Ave purge size | 18.14 |
| % purged | 37.26 |
| Ave pre size | 25.35 |
| Ave pre-pagings | 13.98 |
| % pre-paged | 55.13 |
| Thrashing percentage | 5.25 |
| Ave post in core | 39.70 |
| Ave working-set size | 16.81 |
| Ave used in quantum | 37.66 |
| Pre-page time | 21.77 |
| Post-purge time | 29.40 |
| Calls | 1972 |

much higher than the value observed in the case of dual processor configuration.

r 1419 1.099 4+19

hnu

Multics 15.4x, load 40.5/41.0; 39 users

r 1420 .246 6+11

pad

cpu b 5
gioc a 2 0 7 11 13
mem c 200 on
mem e 200 on
mem d 200 on

— 1 CPU
} 384 K core

clock b 1 25 edt 4
drum 0 7700 1 4 5 6
d270 0 60650 a 27 10. 501060207 3100411
d170 0 105340 a 37 8. 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
ppds 11 1000.
sched 400000 20 20 100
sst 16. 408. 160. 90. 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

r 1438 1.429 6+16

hmu

Multics 15.4x, load 41.5/41.0; 40 users

r 1439 .326 2+17

tcq

avn = 13, elapsed time = 0 sec, 22 active last 15 sec.

| flags | tu | dtu | te | ts | ti | tssc | event | d | ws | process |
|-------|-----|-----|------|------|------|---------|-------|---|----|-------------|
| LEI | 99 | 100 | 1483 | 0 | 0 | .001 | 20336 | 2 | 5 | Chang |
| NLERI | 8 | 9 | 812 | 0 | 0 | -.001 | 0 | 0 | 3 | Sekino |
| WLETI | 336 | 337 | 274 | 0 | 0 | .349 | 0 | 0 | 25 | initializer |
| LEI | 74 | 74 | 61 | 0 | 0 | .616 | 0 | 0 | 16 | Dixon |
| W | 3 | 4 | 0 | 0 | 0 | 5.022 | 0 | 0 | 3 | Willis |
| W | 73 | 74 | 0 | 0 | 0 | 3.000 | 0 | 0 | 13 | Wolman |
| W | 178 | 179 | 0 | 0 | 0 | 2.095 | 0 | 0 | 16 | IO |
| W | 30 | 31 | 0 | 0 | 0 | .058 | 0 | 0 | 30 | VanVleck |
| W | 100 | 101 | 136 | 2000 | 2000 | 8.391 | 0 | 0 | 53 | Stafford |
| W | 30 | 30 | 18 | 0 | 2000 | 11.330 | 0 | 0 | 17 | Fenichel |
| W | 140 | 141 | 106 | 0 | 8000 | 212.405 | 0 | 0 | 64 | Translator |
| | 89 | 89 | 52 | 0 | 8000 | 108.032 | 0 | 0 | 59 | Backup |
| W | 185 | 185 | 45 | 0 | 8000 | 29.053 | 0 | 0 | 25 | Snyder |
| W | 89 | 90 | 25 | 0 | 8000 | 2.567 | 0 | 0 | 22 | Retriever |

r 1439 2.015 6+67