

TO: Multics Performance Log
FROM: R. J. Feiertag
DATE: August 5, 1969
SUBJECT: 30 User Certification of 3.1.1

The enclosed 30 user certification run on system 3.1.1 uses files for output. The most noticeable statistic is the 43.3 sec. average CPU time per process to run the fortran script. This time is much smaller than the PDP-8 simulator runs of the equivalent script with less than 20 users. Three reasons for this discrepancy are the lack of io in the certifier, the PDP-8 simulator having to compete with system programmers and the high degree of sharing by the certifier scripts.

When compared to the four user run this run shows increase in page faults, segment faults, wall crossing faults, and interrupts on a per process basis with the highest increase occurring in segment faults due to the fixed SST size.

As in the four user run the idle time due to eligibility is very high being greater than a third of the total real time. Page faults are still the dominant fault comprising approximately one quarter of the total processing time.

TO: Multics Performance Log

DATE: 8/5/69

FROM: R. J. Feiertag

SUBJECT: Multics System Performance Certification Record

I Variable settings: operating system

System being certified: 3.1.1

Certifier used: multics_test_h Script used: cert3

Number of processes used: 30

Typewriter output: Yes No Number of lines output:

System Segment Table Size: 30K

Number of permanently wired pages:

Maximum number of processes eligible for multiprogramming: 2

Maximum number of processes which may be loaded: 2

Scheduling Quanta, starting with highest-priority queue:

1. 8 2. 8 3. 16 4. 32 5. 6.

II Hardware configuration

Amount of Core Memory: 256K

Number of processors: 1

Firehose Drum: Yes No

Disk: Yes No

Installation used: MAC

Date of Certification run: 8/3/69

Time of Certification run: 545 EDT

III Other factors expected to influence measurements:

This run produces output to a file.

Certification of System: 3.1.1

IV Measurements

a. CPU time breakdown	during process creation	during command sequence	total
1. Time used by subject processes	320.3	1300.3	1620.6
2. Time spent loading processes	3.6	10.7	14.3
3. Time spent in file system daemon	12.4	53.2	65.6
4. Idle time due to eligibility control	134.5	883.2	1017.7
5. Idle time during page waits	4.7	9.2	13.9
6. True idle time	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total CPU time charged	475.5	2256.6	2732.1

b. Breakdown of CPU times used by subject processes

1. Missing-page fault time	59.1	366.1	425.2
2. Missing-segment fault time	30.9	170.5	201.4
3. Linkage fault time	11.8	130.0	141.8
4. Wall crossing fault time	11.7	38.7	50.4
5. Interrupt handling time	10.2	49.9	60.1
6. Non-fault time	<u>182.6</u>	<u>609.0</u>	<u>791.6</u>
Total	306.3	1364.2	1670.5

Certification of System:

c. Fault times and number

Process Creation	missing page	missing segment	Linkage	wall crossing	Interrupt
average fault time	7.0 ms	14.4	43.9	1.6	0.7
number of faults	8427	2145	3000	7200	14612
command sequence					
average fault time	7.3 ms	21.4	29.3	1.4	0.8
number of faults	50113	7957	4440	27510	65951

d. Average times seen by a process

1. Average real time for completion of a process: 2049 sec.
2. Average process creation time: 10.7 sec.
3. Average time for execution of command sequence: 43.3 sec.
4. Time for CTSS to execute same command sequence.
5. Performance relative to CTSS (#4/#3).

V Output of original run may be found in file labeled:

VI Comments: