

FROM: Howard Greenbaum

DATE: February 14, 1968

SUBJECT: Some performance statistics for Multics  
as of 2/13/68

The attached writeup describes a controlled experiment to determine change in system activity due to changes in hyperpage size (small pages only). Three bootloads were made, changing only the hyperpage size and stopping the system immediately after receiving an answer from "echo".

Some of the statistics found are baffling (note run times) and it would be appreciated if the reader would return his comments, conclusions, and philosophy to me.

Howard Greenbaum & Gerry Clancy  
2/13/68

To determine the effects of different hyperpage sizes on system initialization times the runs listed on the next page were made. They were run on a 256 K system. Included in this group of papers you will find Karolyn Martin's run of 2/11/68. Percentage of paging time seems lots lower ( she was using a hyperpage size of 2). This is only because our three runs were terminated after one short echo command and response, and hers exercised the command system more. Consequently time spent in px and master\_mode\_ut segments was higher for her and lowered the percentage of paging time. Subtracting the time spent in these segments from the total time and taking the percentage for paging using this new total yields the following percentages:

Karolyn's: 47.4%

Our hyp=2 run: 51%

Our hyp=4 run: 42.8%

Our hyp=8 run: 46.1%

Adding percentages for/page and/segment times together yields  
the total percentage of fault overhead:

Karolyn's: 60.8%

Our hyp=2 run: 60.5%

Our hyp=4 run: ~~64.1%~~ 54.1%

Our hyp=8 run: 62.1%

Howard Greenbaum & Gerry Clancy  
2/13/68

Hyperpage size:	2	4	8
Total run time:	1246.25 secs	1252.34 secs	1265.00 secs
# page faults:	4472 <sup>156ms</sup>	3398 <sup>141ms</sup>	3564 <sup>156ms</sup>
page fault time:	609.170 secs	487.623 secs	556.461 secs
% time for p.f.:	48.89%	38.94%	43.99%
# Seg. Faults:	1110 <sup>168ms</sup>	1185 <sup>110ms</sup>	1534 <sup>129ms</sup>
seg. fault time:	118.635 secs	128.670 secs	196.534 secs
% time for s.f.:	9.52%	10.27%	15.54%
assign:	32.86	21.93	47.86
misc:	167.22	147.13	168.09
bug:	109.14	91.92	100.35
dev_ctl:	206.02 <sup>32ms</sup> -67 = 147	179.79 <sup>37ms</sup> -61 = 118	208.02 <sup>40ms</sup> -63 = 145
<b>**total**</b>	515.24 secs	440.77 secs	524.32 secs
tdope_	21.76	21.82	27.29
ptr	43.37	40.48	44.52
movstr	43.48	40.32	42.83
ilock	29.39	37.47	29.18
px	26.23	76.71	23.73
master_mode_ut:	23.54	36.50	17.24
Run date	2/12/68	2/13/68	2/13/68

→ whatever is missing depends on # page size.

Why so many decimal places?