

J. N. Salzer

TO: Multics Performance Log
 FROM: A. Sekino
 SUBJECT: Results of Multics Performance Measurements
 DATE: March 12, 1970

The recent results of Multics performance measurements are summarized below.

The modified version of the PDP-8 measurement system made it possible to measure a system response time and a total real time of the simulation accurately. One of the results is the average response time of the 5.9 system as a function of the number of users on the system, shown in Figure 1. This figure should be compared with Figure 3 of MPL-41 or Figure 1 of MPL-39.

1. Summary of Performance Measurement Results

Time unit: second

Average: per interaction

Date	Run No.	No. of Users	System	Total CPU time	Total No. of P. F.	Total Real Time	Average CPU Time	Average No. of P. F.	Average Response Time
2/9	MPM87	22	5.6F2	50.483	2936	2342	.765	44	7.9*
2/18	MPM88	26	5.7	--	--	--	--	--	--
2/20	MPM89**	20	5.7A	63.160	3055	2316	.957	46	7.1*
3/4	MPM90	18	5.9	44.182	2718	2319	.670	41	7.3*
3/7	MPM91	11	5.9	32.809	1987	2183	.497	30	2.2
3/9	MPM92	23	5.9	49.813	3031	2347	.755	45	7.1
3/9	MPM93	19	5.9	46.271	2812	2299	.701	42	5.8
3/9	MPM94	13	5.9	33.032	1889	2184	.500	28	2.
3/10	MPM95	25	5.9	50.557	2967	2363	.767	44	7.8

* The average response time measured in MPM87 through MPM90 includes the command transmission time of about one second. Therefore, one second must be subtracted from the above values to compare with those of the recent measurements.

**During the measurement of MPM89, the system had a dual processor configuration, eligible time, t_e , was a variable (t_e first = 1, t_e last = 2), and the maximum number of eligible processes, e_{max} , was changed from 3 to 2 in the middle of the measurement run.

second half of the script	edm	17	1.8	1.7	7.2	3.5	4.4	
		18	0.5	1.0	1.3	6.4	3.1	
		19	1.9	1.0	3.1	6.4	4.4	
	fortran	20	6.1	6.5	16.2	23.2	11.9	
	edm	21	2.5	1.8	5.1	3.8	4.1	
		22	1.0	0.6	4.1	2.5	7.2	
		23	0.2	0.1	2.8	8.6	5.4	
		24	0.6	0.7	1.8	4.1	9.0	
		25	4.5	1.4	3.7	2.2	5.0	
		26	0.6	1.2	2.0	6.3	4.5	
	fortran	27	7.2	7.1	20.3	15.7	27.7	
	rename	28	1.8	1.8	3.0	4.6	5.4	
	print	29	0.7	3.3	4.3	6.0	7.8	
	b-prime prime	30	1.5	1.6	1.8	4.6	4.7	
	List	31	1.1	1.1	5.1	2.7	7.7	
	df	32	2.0	1.5	5.0	5.0	5.0	
	Sum	1st half		37.2	40.3	101.1	124.0	132.9
		2nd half		34.0	32.4	86.8	105.6	117.3
		total		71.2	72.7	187.9	229.6	250.2
	Average Response Time	1st half		2.3	2.5	6.3	7.7	8.3
		2nd half		2.1	2.0	5.4	6.6	7.3
		total (all)		2.2	2.2	5.8	7.1	7.8
		total (except fortran)		1.4	1.5	3.8	5.1	5.4

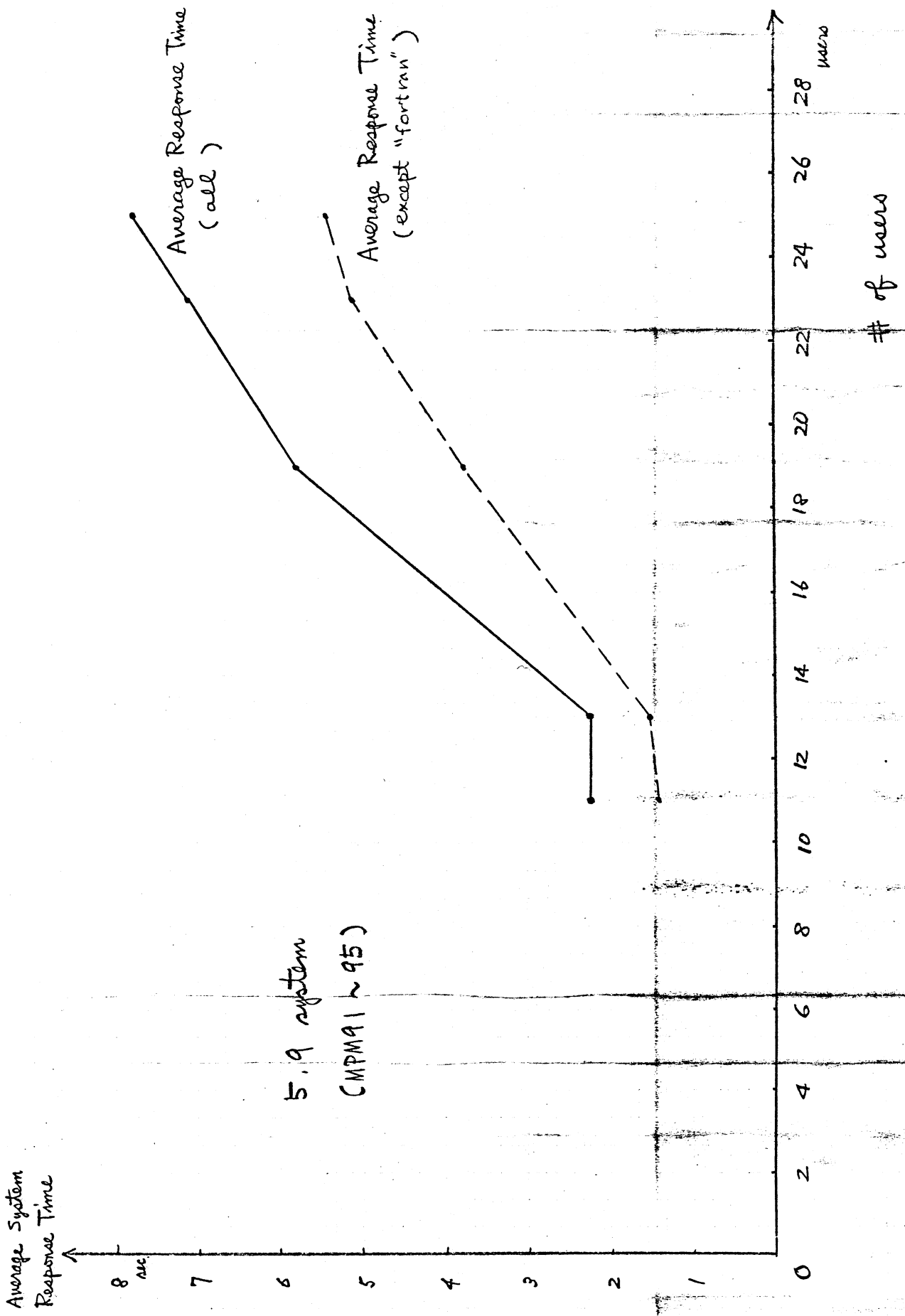


Figure 1 Effect of the number of users on the average system response time

2. System Response Time (5.9)

Table 1

Run #		MPM91	MPM94	MPM93	MPM92	MPM95
System #		5.9	5.9	5.9	5.9	5.9
System Parameters	# users	11	13	19	23	25
	# processors	1	1	1	1	1
	e max	3	3	3	3	3
	te	2	2	2	2	2
first half of the script	edm 1	3.0	2.0	5.2	12.0	8.7
	2	0.5	0.5	2.4	1.2	7.4
	3	2.0	1.6	6.0	4.3	9.5
	fortran 4	8.3	6.8	20.7	21.7	25.0
	edm 5	1.6	1.4	4.7	4.5	4.9
	6	0.4	2.0	4.8	3.9	2.4
	7	1.1	0.6	1.6	3.5	6.4
	8	0.6	1.1	2.7	3.7	3.9
	9	0.3	0.6	3.6	7.2	1.2
	10	0.1	2.1	6.0	3.0	1.6
	fortran 11	8.4	9.9	21.9	24.8	33.9
	rename 12	3.0	3.5	4.4	7.6	6.6
	print 13	0.8	1.9	4.4	10.0	5.3
	a prime & prime 4	1.8	2.5	2.8	4.2	4.3
	List 15	2.0	2.2	4.0	3.2	4.6
	df 16	3.3	1.6	5.9	9.2	7.2

2. System Response Time (5.9)

Table 1

Run #		MPM91	MPM94	MPM93	MPM92	MPM95
System #		5.9	5.9	5.9	5.9	5.9
System Parameters	# users	11	13	19	23	25
	# processors	1	1	1	1	1
	E _{max}	3	3	3	3	3
	t _e	2	2	2	2	2
first half of the script	edm 1	3.0	2.0	5.2	12.0	8.7
	2	0.5	0.5	2.4	1.2	7.4
	3	2.0	1.6	6.0	4.3	9.5
	fortran 4	8.3	6.8	20.7	21.7	25.0
	edm 5	1.6	1.4	4.7	4.5	4.9
	6	0.4	2.0	4.8	3.9	2.4
	7	1.1	0.6	1.6	3.5	6.4
	8	0.6	1.1	2.7	3.7	3.9
	9	0.3	0.6	3.6	7.2	1.2
	10	0.1	2.1	6.0	3.0	1.6
	fortran 11	8.4	9.9	21.9	24.8	33.9
	rename 12	3.0	3.5	4.4	7.6	6.6
	print 13	0.8	1.9	4.4	10.0	5.3
	a _{prime} &prime ₄ 14	1.8	2.5	2.8	4.2	4.3
	List 15	2.0	2.2	4.0	3.2	4.6
	df 16	3.3	1.6	5.9	9.2	7.2