

12/11/21

### Why track about performance?

1. A prime issue is whether all of Multics can be achieved in a general (scalable, secure) system.
2. Current performance (8-10 users) is clearly not ~~enough~~ <sup>enough</sup>. Other systems (e.g. IBM) have more than 100 users. How do we do more, (TOS, hardware, software) why do we believe in this or different?

Ans:

- A. We have a set of tools which give a lot of help.
- B. Help is provided through the following: what can we do now. (Target: 32-64 users (60 is good))

Basic answer: it is slow now, but we know why and how to fix

The fact: We do not see yet any hard (intrinsic) storage, and we do see → 32 users.

### Discussion

- a. tools
- b. performance objectives April
- c. Technical improvements coming
- ~~d. partial state of Multics~~

RECEIVED,  
F. J. CORBATO  
DEC 10 1968

(P. 1) Saltzer

Meeting 12/9/68

Structure & resources }  
↑  
What will flip chart work

Orientalis: Documentation (bibliography); 3 organizations people  
across the area; backbone  
Mol Donor can help. produce list of people & what they do.

Can also help construct holdings, <sup>across</sup> institutions.

Get copies of CTBS Comprovis to the group

Goals

What we are trying to do: (ACS FCC C.F. CTBS <sup>not</sup> want pay to)

Focus: what we are not trying to do

five general multiprogramming (automated) first dynamic reconfiguration

3 major <sup>dynamic</sup> aspects:

- a. privacy / control of access to info.
- Donor expand scope for decision of control rings
- b. foundation aspects

Donor enter bureau example

Donor: ~~can~~ review price that special mechanisms chosen on hand on goals, not goals themselves.

Restrictions ~~evolve~~ characterize class of system which can be based on this system (e.g., mobility, data base, etc.)

n.b. changing the mechanism does not

Donor → emphasize evolvability of M.H.C.s.  
c. breaking the <sup>cost</sup> mechanism for system ideas

includes changing the

Mechanisms: ~~fast~~ parallel processing, homogeneous, long names, dynamic linking, hierarchical file system.

Few: Multiple test bed aspects. for future research.

Wierzbom: Users will contain ability to ~~and~~ modify the system.

Minsky: Real problem is to describe a problem that this system is trying to solve.

a.g., why is access control a problem?

no obvious answer is found

Wierzbom: Forget to emphasize ability to share + distributed control of responsibility.

Part of agenda: 1h. history  
2h. status  
1h. future

Technical level  
organizational level  
Schedules  
1-2h. performance

Timeline  
a. 1/2h structure  
b. 1h goals  
c. 1h reviews

d.  
e.  
f.

} reasons } This action is puzzling (Fors)  
 } goals } (c/w CTBS)  
 } objective }  
 } problems }

Mackay / Weinbaum (Consensus)

STATE CTBS view, give examples of problems CTBS did not handle well.

build up from that point of view.

(See Weinbaum when) ←

Fors test groups of people who found CTBS not perfect.

(Why did we decide not to re-implement CTBS on modern hardware.) (Use historical approach)

Weinbaum Emphasize: acknowledge debt to CTBS. It was a good system, we helped the good ideas.

Wick Keep organization flexible.

Other topics

Performance

Longevity

Future problems

expert ability

of ideas

(What are your contributions)

← Weinbaum

Davis → PC/I effect on performance

(from Weinbaum + Hinkley)

- ① Some unresolved problems
- ② Our ideas for attacking some of them.  
(also what we are not attacking and perhaps why not)
- ③ The emerging implementation of our ideas.  
How they meet the problems given in ①  
Additional fallout (if any)  
Where we're stuck and how we're going to get on.  
mechanisms etc.

Tomorrow (fast)

Needs the intro? No

Go on to last main topic.

F.S. Time

10  
9  
8  
2

46 P.F.

18 S.F.

15 A.F.

5 Comp.

$\sim 80\%$  of time in F.S.

+ 20% idle time.

$$\frac{38}{58} = \frac{2}{3} \rightarrow \frac{13}{19} = \frac{1}{3}$$

1. Reduction of F.S. size will reduce P.F. (Assume no new time)

2. Reduction of F.S. size will reduce running time.

Presume P.F. time =  $\frac{1}{3}$  power

SC/D.C size/time =  $\frac{1}{2}$  power.

38 sec  $\rightarrow$  19 sec.

inc comp

58  $\rightarrow$  39 sec.

\* P.F.  $\rightarrow$   $\frac{2}{3}$  of power \*

$$46 \times \frac{1}{3} \times \frac{2}{3} = \sim 10 \text{ sec.}$$

$\uparrow$   $\uparrow$

speed up fewer

wind up

Conservative

10

19

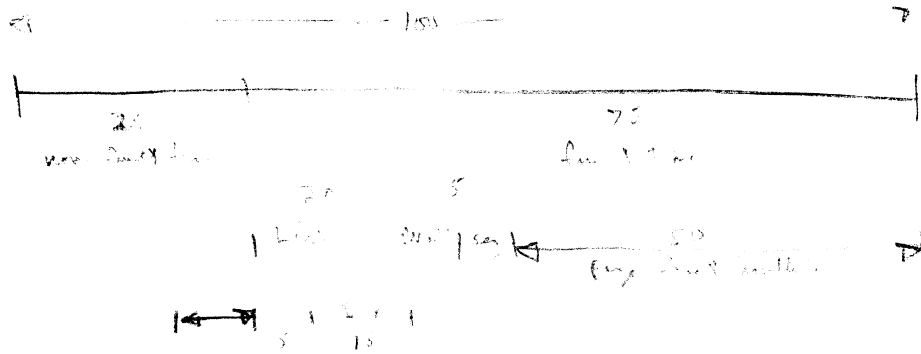
5

15

6

100 } sec

(54) sec.



File system size

$$50 + 15 + 2 \geq \frac{2}{3} \cdot 100$$



- a. total size
- b. probability of orange
- c. var. file size smaller total volume  $\neq$  avg. size smaller



# Multi-System Planning

Dec. 11, 1961

1. Empty copies (see form?) - Graham + M. Jones
2. Documentation (collection by Graham;
  - a. annotated bibliography of KWIC, Saltzer) - Saltzer
  - b. personal copies of: Cont. Conferences; <sup>+ reports, thesis</sup> reprint; cf. SS notes; MUM TOS.

etc. Room copy: MSPM  
MPN  
MCB's  
Repository Doc.  
Listings  
MSS - checked listings (?)

3. Console sessions: Van Vleck + K. Martin
4. PDP-8 demo, (ARDS banner as field) - Grochow
5. People list (functional org.} - activity leaders) + helpful people - Daley
6. Operations Summary: - Saltzer + Corbale
  - a. Meetings: MPM, Staff mtg, oper. mtg., (proj. interrupt driven)
  - b. ~~Systems~~ Systems: CTSS, 6036, Cecos, Multics booth, Console sessions, BES
  - c. Operators
  - d. ~~Documentation~~ Internal doc. groups:
  - e. ~~Specific~~ <sup>oper.</sup> team: MST + library generation; debug + analysis; console sessions.

Dec. 11, 1965

### Background info:

1. Checker listings
2. Bar graphs
3. Console session results
4. Hdw. config. list (w/ prices) + graph
5. All MPN's

### Internal Doc. (distinguish <sup>technical</sup> ~~use~~ from <sup>project control</sup> ~~policy~~ paper)

1. Checker listings
2. Operations log daily reports
3. Weekly Task Report summary
4. Bootload log (obs.)
5. MPN
6. Task notebook (predecessor of MPN, now obs.)
7. Moposting staff notes
8. MSIM
9. MCB's
10. Reportaries
11. Muller's operators Manual (draft)
12. MUM (now very early draft)
13. Cuts of Cond. guide (draft)
14. Organich notes (ch 1-6)
15. Design notebook (obsolete)
16. MCB Progress reports

Dec  
20 11, 1962

1. Introduction  
2. History (1950-60)

3. The state of the matter development

4. Summary of the state of the matter - All

5. The organization

1. Introduction & project structure
2. Scope & objectives (including development)
3. Technical objectives, progress & accomplishments
4. Value of system improvements & results
5. System reliability & availability (impact)
6. Services in future, maintenance & support (MOS, MIS, etc.)
7. File system & future needs
8. Performance analysis & tools
9. Summary of language & command requirements