Memo to: V. A. Vyssotsky (BTL)
From: Robert R. Fenichel
Date: October 7, 1966
Subject: Interface between Transactor and I/O System

There may be some confusion about the interface in question. This memorandum explains my current understanding of the matter.

(1) General Nature of the Transactor

MULTICS hopes that the modal user will be satisfied by that share of the hardware that chance allots to him (There are also cumulative bounds, but these are not at issue here.). MULTICS hopes, for example, that the modal user will be satisfied with

a) an average chance of capturing n tapes

b) average response

c) ordinary look-behind multilevel treatment

In addition, MULTICS hopes that transients in individual behavior will average out so as never to degrade general system performance. In general, the Transactor exists to correct for inadequacies of the simple stochastic approach. In particular, the Transactor

a) provides a facility for reserving certain system resources (the reserver),

b) provides a facility for improving response (the responder),

c) provides advice ports to the multilevel storage management system, porter?

d) provides predictions of the performance of the system, primarily for users who wonder about the utility of purchasing other transactor services (the estimator), and

e) performs dynamic load-leveling (nice name for automatic logout) to correct for extreme transients in offered load (the load-leveler).

The transactor really doesn't do anything else. Really.

(2) Interface with I/Ø System

a) Suppose that I have reserved tape drive #6 from 1400 to 1500 today. What does the transactor do for me?

1) The transactor is aware of two device-dependent parameters: Suppose that the Smallest Probable Useful Tape Attachment Time is 10 minutes, and suppose that the maximum Reasonable Tape Set-up Time is 3 minutes.

2) At 1347, the Transactor will try to attach the drive in my name. If you are using it, the Transactor will arrange to attach the drive as soon as you release it.

3) At 1357, the Transactor will attach the drive in my name. If you are using it, the Transactor will have you kicked off.

This accounts for calls by the Reserver on the I/Ø System. Calls from the I/Ø System to the Transactor do not arise in connection with the normal reservation procedures.

Suppose, for example, that I ask the I/Ø System for a scratch tape on drive #6. If my request is denied, the reason must lie with

1) me, or

2) the drive

It might be, for example, that I am not entitled to use the drive, or to use tapes at all. Such restrictions might be contained in a sort of concealed--that is, protected from me--user profile.

On the other hand, the drive might have a label on it saying

1) "Fenichel keep off," or

2) "Down or otherwise non-existent," or

3) "Attached to Saltzer."

There are no other sorts of labels. One might think in terms of a Transactor-ish label, such as

4) "About to be used. If you get on, you will be bounced at 1357."

But such labels will not appear. If this drive is subject to reservation, the way I should use it is to reserve it. In any event, the information in label (4) can always be obtained by an explicit call to the estimator.

b) The load-leveler will make occasional calls to the I/Ø System to obtain a parameter (mean GIOC queue length?) which will serve as a crude measure of I/Ø load.

c) In order to improve a given user's response, the Transactor might conceivably want to ask the I/Ø System to give preferential treatment to that user. In fact, we will almost certainly not want to do this; the complexity/utility ratio is probably too high.

d) The transactor and I/Ø System interact in no other ways known to me.

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