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TO: **Administrative Distribution**
FROM: M. A. Padlipsky, F. J. Corbató
DATE: June 17, 1971
SUBJECT: Multics Administration for ARPA Network Users

BACKGROUND

With the imminence of Multics' becoming a regularly-functioning node of the ARPA Network, certain considerations which require administrative resolution are brought to light. This document deals with those considerations in two ways, making proposals for the resolution of some and citing others as issues to be resolved. For the most part, the intent has been to fit Network issues into the "normal" Multics apparatus; however, this view has occasionally led only to an underlining of the need to complete a projected normal apparatus.

Much of the thinking reported on here grew out of the necessity to prepare a section on Multics for the Network Resource Notebook. (Although some of the proposals here are embodied in an already-submitted draft, the commitments were deliberately kept minimal and the compiler of Resource Notebook is aware of the possible need for alteration of some of the details of the draft before it is published.) As a result of this, and because they are the more compelling in some absolute sense, only questions involving the use of Multics by Network users -- as opposed to the use of the other Network systems by Multics users -- will be addressed here.

The categories in which the forthcoming proposals and issues are treated differ according to the different bases on which Multics will be used over the Network. Project MAC's contract with ARPA directly provides for the support of a certain amount of Multics Network usage; this leads to the first basis, which from the M.I.T. Information Processing Center's point of view can perhaps be thought of as "indirect-charge customers". That is, the charges will be dealt with in the same manner as are those for other MAC users and will be paid for by Project MAC. The other basis is that of "direct-charge customers", which are billed directly by IPC. The final category of the discussion, of course, deals with considerations which are common among both indirect- and direct-charge customers.

COMMON CONSIDERATIONS

1. Proposals

Two system software modules must be installed for the Network. One is a Network Daemon process, which will manage the ARPA supplied Interface Message Processor (IMP) through which all Network traffic passes. It is proposed that this Daemon -- which can probably be consoleless when the absentee user facility is complete -- be administratively dealt with as if it were a "SysDaemon" in that no direct charge be made for its existence. (Note that this is not a suggestion that it be given SysDaemon access privileges, however.) If the Network Daemon becomes involved in file transfer operations later, it can make per-user accounting calls along the line of the I/O Daemon. The other module, the Network "Logger",

exists within the Answering Service, where it should introduce no greater overhead than for a local login.

In the area of rates, it is proposed that per-user "line charges" for the Network be treated initially on the same basis as teletypewriters. To a first approximation, the lower costs of the Network's adapter and the fact that no modems are involved should offset the relatively small amount of additional wired-down core necessitated when the Network is in use. If operational experience suggests that this rate is incorrect it can, of course, easily be changed. Note that the Resource Notebook draft does not specify a rate structure at all; rather, it refers interested parties directly to the information Processing Center.

For user consulting, the Resource Notebook draft encourages contacting a member of the MAC Computer Network Group (T. P. Skinner) for both initial Multics use and all Network-related questions. The IPC Programming Assistance and Information (PAI) office is the advertised source of consultation for the Multics-oriented questions of non-brand new users. A briefing on the Network for PAI office personnel can be furnished if desired. (The Resource Notebook could be altered to channel all consultation through MAC if the PAI office prefers, but the proposed division seems to conform most closely to "normal" practices.)

The final proposal in this area has to do with the furnishing of Multics Programmers' Manuals. One copy per Network site will, as offered in the Resource Notebook draft, be furnished (on request) by the Computer Network Group at MAC. It is assumed that additional copies will be purchased from IPC.

2. Issues to be Resolved

With the presence of distant users on the system, the notion of "limit stops" (i.e., enforced cutoffs on CPU time usage) seems to become even more desirable, as billing problems vis a vis over-runs are likely to worsen. Although special-casing can cope with "indirect-charge customers" (as discussed below), direct-charge customers both local and distant would doubtless be better served by a general solution -- and it would be nice to avoid even the former special-casing, if only on principle.

Another local issue which the presence of distant users makes more noticeable is the possibility that "*.*.*" file access might be viewed as too permissive for users not registered by name. As it is planned that a portion of the indirect-charge customers' use of the system will be given out on an "anonymous user" basis, at the least the existence of both Network and local anonymous users should be well publicized. In addition, an improvement to the access control mechanism is proposed which would permit easy specification of whether or not "*.*.*" applies to unregistered users.

A final common issue is that of bulk I/O. It is proposed that printer and punch output should be mailed to distant users for mailing costs -- and perhaps a "small handling charge".

INDIRECT-CHARGE CUSTOMERS

Although the broad class of indirect-charge customers, as a kind

of subset of local MAC Multics users, should not "get in the way" administratively, a few points might be of interest here.

1. Proposals

A "Network" project is proposed to cover both anonymous users (provided to allow sampling of Multics without necessitating a more or less elaborate registration procedure) and those Network users who are given their own passwords and named subdirectories. As with other MAC use of the system, this project would be administered by MAC personnel (A. Vezza).

A login responder will be furnished by the Computer Networks Group. It will manage anonymous logins (for which it is planned that no password will be required), and, if necessary, limit the "number of lines" (i. e., users).

The login responder could also (employing existing machinery) impose a command subset on anonymous users, in order to keep their demands or system resources low. This step would not be taken unless "sampling: use of Multics threatens to devour the MAC allotment.

2. Issue to be Resolved

Unless system-wide lines limitation/rationing comes to pass before Multics goes on the Network, the exact number of lines for the "Network" project must be agreed on. Three or four seems to be a good level on which to start a discussion.

DIRECT-CHARGE CUSTOMERS

(The intention in this last category is for handling to be as unexceptional as possible.)

1. Proposal

The administration of direct-charge customers over the Network is proposed to be handled by IPC in its normal fashion, with billing worked out as appropriate. Separate projects are assumed to be part of the normal procedure. (It should be noted that the concept of projects is quite central to the Multics view of access control.)

2. Issues to be Resolved

The question of competition for lines is really separable from the indirect-charge customers' case. If it be decided not to allow free competition for Network paying customers, the enforcement mechanism must be considered. The "Logger" could handle this*, but perhaps the time is ripe for a system-wide rationing mechanism.

A final point to be raised is that of use of secondary storage. In this case, it seems that the added demand brought about by the Network might well be the spur needed to get a "user archive tape facility" off the ground.

* The total number of users over the Network (both direct- and indirect-charge) is governed by the number of pseudo-teletype "channels" the Loggers' data base contains. The number of indirect-charge "Network" project users will be governed by that project's login responder until and unless a party-group mechanism comes into being.