DRAFT

TO: Distribution

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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 adminis-

trative 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 ques-

tions 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 amoung 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 Manager 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, courtesy of the "Answering Service write-

around" which allows special casing of Network Logins "for free".*

In the area of <u>rates</u>, it is proposed that per-user "line charges"

for the Network be treated initially on the same basis as teletypewriters.
It is felt that the lower costs of the Network's adapter and the fact

that no modems are involved should offset the additional wired-down

core necessitated when the Network is in use. If operational experience

suggests that this rate is too low (or, for that matter, too high) 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 <u>consulting</u>, the Resource Notebook draft encourages con-

tacting 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 pro-

posed division seems to conform most closely to "normal" practices.)

The final proposal in this area has to do with the furnishing of

<u>Multics Programmers' Manuals</u>. One copy per Network site will, as offered

* A hidden assumption here is that the Network software will be run all
  the time. This is actually a proposal, and is subject to modification.

in the Resource Notebook draft, be furnished (on request) by MAC.

It is assumed that additional copies -- and updates for all 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 cus-

tomers" (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.

At the most, perhaps a change to the access control mechanism which does

not permit "anonymous" to match "*" should be considered.

A final common issue is that of bulk I/O. Unless Operations strongly

disapproves, 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 pass-

word will be required, and that a one-CPU-minute time limit per login

will be established), 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. If needed, the

login responder would be coded and checked out by MAC personnel.

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 (and perhaps for direct-charge customers as well) 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, although there are certainly no Network-related technical objections to lumping all direct-charge customers together onto a single "project" if this were to prove administratively convenient in the alloting of disk and time quotas. (It would probably complicate billing, however.) Another argument in favor of separate projects is the consideration that the concept of projects is quite central to the Multics view of access control.

2. Issues to be Resolved

The questions 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 "party-group" mechanism.

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* The _total_ number of users over the Network (both direct- and indirect-charge) is governed by the number of pseudo-teletype "channels" the Loggers's 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.

A final point to be raised is that of <u>competition</u> <u>for</u> <u>secondary</u>
<u>storage</u>. 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.