PROGRAMMING STAFF NOTE 63

TO: CTSS Maintenance and Development Staff

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SUBJ: Current Restrictions to DAEMON Operation

Currently, the CTSS DAEMON(s) do not operate exactly as the original specifications stated. This memo explains the deviations and the limitations. It is to be noted that some of the restrictions (e.g. those involving links) are "philosophically profound" and their removal will require changes to the file system. On the other hand, the removal of other restrictions is quite reasonable and could easily be attempted on a two or three week basis.

Original references may be found in CC-258 or MAC-M-289, and CC-252-2 or MAC-M-232-2.

Reloading Under CTSS

Currently, reloading under CTSS is not feasible for the following reasons. Until **further notice,** Disk/Drum reloading will not take place under CTSS.

1. Suppose reloading is in process under CTSS and a director entry for a user by the name $\alpha\ \beta$ has not been made yet because the Daemon has not yet encountered the latest U.F.D. for the user. $\alpha\ \beta$ is a file that should be loaded to reinstate accurately this users director to its pre-crash status. This user may login and inadvertently create a new file by the name $\alpha\ \beta$ of a completely different nature than the file $\alpha\ \beta$ on tape. When the true file $\alpha\ \beta$ is encountered it will not be loaded because it already exists on the disk with a date-last-modified later than the file on tape. The Daemon thinks it has already loaded a more recent version of the same file and therefore disregards the version on tape. In this way, a file that should be loaded is missed because the user did not remember that he formerly had a file of the same name as the one he created anew.

A possible solution to this dilemma would be the following Daemon procedures:

1. Have the Daemon remember the date and time reloading began.
2. When a check is made to see if a disk version of a file is later than a tape version of the same name, check the date and time reloading began to see if this file deserves **exceptional** consideration.

3. If there is a possibility of a file not being loaded when it should be, the file from tape can be loaded under a different name specifiec by the Daemon. An URGENT MAIL can then be left for the user stating what has happened, the name of the conflict file and the new name of the loaded file.

2. If reloading is taking place under CTSS all files loaded are left with the Mick's Mode bit on (200 octal) until such time as the most recent U.F.D. dumped for a user is read from tape. Before an actual file is read a skelton entry of zero length is made in the users directory of mode 200. Normally, when the actual file is read later the file length is other than zero except when there existed at some time in the past a file whose actual length was zero. In this case, after the file itself (of zero length) is read from tape the net result is indistinguishable from a temporary skeleton made previously by the Daemon. If, because of tape reading errors, the latest U.F.D. for a user is never read, the Micks Mode bit will not disappear. Then, when loading is finished this entry is examined. The Daemon believes that the zero length, Mick's Mode file is one which was not read correctly (it would be non-zero length otherwise) and deltes the file, leaving a message to this effect for the user. In this way, a legitimate directory entry is not restored as it should be and a file is missed.

   This dilemma seems to be irresoluble unless weird gyrations are made by the Daemon to leave sufficient clues in the directory entry to flag a true zero length file.

Consolation

If reloading does not take place during CTSS, the complete dump need not be done by dumping the user's files in successive backward increments according to date-last-used. Complete dumping can be a straight forward copying of all users files into tape without consideration of the date-last used of the files Since successive passes over the M.F.D. are not required, considerable time is eliminated for the execution of the complete dump (30 - 40 percent of the total time now required). In this way, less tape is generated for the dump and considerable time is also eliminated for execution of the complete reload.