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Identification

User Log
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Purpose

The user log contains an entry for every login and logout occurring at a Multics installation. A login occurs whenever a user explicitly requests and receives admission to the system and a successful login implies positive identification of the user and validation of his right to use the system. A logout implies that a user, who is currently logged in and is using the system, formally ceases to use the system and must log in again in order to use the system at a later time. (The terms logout and login do not refer to such an occurrence as suspending and restarting an absentee process-group, since this occurs without the user's knowledge and restarting the group does not require the user's intervention.)

The user log records all logins and logouts occurring at an installation. Reference to the log can help to clarify questions which arise concerning computer usage. For example, John Doe may claim that his bill for the preceding month is excessive, since he did not use the computer at all that month. A shuffle through the user log will determine if and when he logged in and aid in solving the dispute.

In addition a record is kept in the user log of unsuccessful attempts to log in. This record may be useful in detecting attempted violations of system privacy.

Discussion

The user log is kept in a segment in the Log Directory and has path name

```
>log_dir>user_log
```

When the user_log segment becomes full, it is renamed "user_log_n" where n is the (3-digit) number of user log segments which have become full. Then a new current log segment is created, named >log_dir>user_log. Thus at some time the log directory may contain user_log_001,

user_log_002, and so on to, say, user_log_010. The first entry in each log segment records the date and time of its creation. Old log segments are available to the system administrator or to the locksmith for all eternity (the duration of eternity being determined by the system administrator).

The user log is accessible to the system control process-group (includes the user control processes, see BQ.0) for appending from the administrative ring. To append an entry to the user log, user control processes execute the user_log_keeper procedure (see below). (Because of hardware limitations it is expensive to implement the append attribute without read and write attributes, and therefore the system control process-group will initially possess all three attributes with respect to the User Log. In a later version of Multics this will hopefully be unnecessary.) The User Log is accessible to the system administrator and to the system locksmith for reading but not for writing or appending.

User Log Keeper

To place an entry in the User Log, the user control module or absentee monitor makes the call to the ring 1 procedure (callable from ring 1):

```
call user_log_keeper (type, entry);
```

where entry is a character string containing the information to be placed in the user log, and type indicates the general nature of the entry:

```
type = 1 indicates login  
type = 2 indicates attempted login  
type = 3 indicates logout  
type = 4 indicates automatic logout
```

The log keeper formats each entry and writes the following information into the log:

- 1) the date and time
- 2) the type of entry
- 3) the entry

The log keeper uses the techniques described in BY.3.01 for appending to the User Log. Then the `user_log_keeper` attempts to write the entry into the output stream (indirect frame) "`user_log_typewriter`". If the system control process has attached an operations typewriter to this frame then the user log entry is also written out at the typewriter. Otherwise, the call to write is unsuccessful and abandoned. The installation controls printing of the user log by controlling attachment of the "`user_log_typewriter`" frame in the system control procedure (see BQ.1.01).

The user log segments are in the form of ascii text such as can be produced or printed by the editor or print commands. For convenience, an administrative command is available to enable the system administrator to print out relevant sections of the log:

```
print_user_log time1 time2 sw
```

`Print_user_log` causes that portion of the log written between `time1` and `time2` to be printed. If `sw = 1`, `print_user_log` requests a printout on the offline printer. Note that since the average user does not have access to the User Log, `print_user_log` will not function for him. Instead it will signal an error, using the Multics command system standard error handling mechanism (see BY.11.00).