To: MTB Distribution

From: F. C. Smith

Date: November 18, 1974

Subject: estimate_bill command.

A new command, estimate_bill, is proposed to enable users to obtain information about resources consumed during a session and their cost. A draft MPM writeup is included.

It will be necessary to extend the Process Initialization Table (PIT) to include the total memory units and terminal I/O operations for previous processes in the current session, as well as the total virtual CPU time, which is already included. This will be needed for any application in which figures for resource consumption in the current session are desired, as well as for implementation of the estimate_bill command. It will then be possible to obtain the usage for previous processes from the PIT, and the usage for the current process can be obtained from the supervisor.

Name: estimate_bill, eb

The estimate_bill command prints a report about the CPU time, memory usage, terminal I/O, and connect time for the current console session and their cost. Arguments allow the user to specify various parts of the available information to be printed, or to specify that initialization is to be performed.

Although Multics keeps very accurate records of the total resources that a user has consumed on each shift during the current month, a breakdown by shifts of usage for the current session is not kept. It is therefore necessary to record information about usage on different shifts if a shift change has occurred during the current session, and accurate cost figures are desired. This information will be recorded at the time the shift changes if the estimate_bill command (with any argument) has been given during the current process. The purpose of the argument "-init" is to set a timer for the next shift change, without producing output, so that the usage for the shift that ends at that time can be recorded. If usage information is recorded, a segment will be created for this purpose in the user's login directory. It will have the name username.eb_data, where username is the user's login name, and will be created only if the shift changes.

If the information requested cannot be computed accurately,

---

i.e. a shift change has occurred during the session and the usage
for that shift was not recorded because the user did not set up
the estimate_bill command to do so, the breakdown by shift will
be estimated. The first time estimate_bill is invoked after a
shift change at which usage was not recorded, the missing values
will be estimated by assuming that the amounts of CPU time,
memory usage, and terminal I/O per unit of real time are constant
for the whole session. The estimates for past shifts will then
be recorded and used in future invocations of estimate_bill.

Usage

        estimate_bill -control_arg-

1) -control_arg-   Provides the ability to select various
                        portions of the available information to be
                        printed, or to initialize the command.

    -init   This argument initializes the command for a
                        process. A timer is set to go off next time
                        a shift change occurs. When this timer goes
                        off, the usage for the shift that ends at
                        that time will be recorded, as described
                        above. Any use of the estimate_bill command
                        will set this timer; the -init argument
                        suppresses the printing of information. If a
                        user is interested in obtaining accurate
                        usage values for a session that may include a
                        shift change, this command should be given at
                        the beginning of each process in the session,
                        or be included in the user's start up
                        exec_com.

    -long, -lg   Prints the most detailed information about
                        the resources used during the current
                        session. The display includes a report of the
                        total virtual CPU time, memory usage,
                        terminal I/O operations, and costs, broken
                        down by shift.

    -brief, -bf   Prints only the total cost of the current
                        session.

    If no argument is given, the dollar cost of the current
session is printed, broken down by shift. If usage has to be
estimated, this fact will be indicated.

    If the estimate_bill command is given during an absentee
session, the output will be placed in the output segment. For
absentee processes, shifts have no significance, and giving the
command "estimate_bill -init" will have no effect.