

PROBLEM DESCRIPTION

Develop a multi-process program that determines the amount of time necessary to run a command from the command line.

LOW LEVEL DESIGN

- t0 and t1 are pointers of datatype timeval which includes
 1. time_t
 2. tv_sec
 3. seconds
 4. suseconds_t
 5. tv_usec
 6. microseconds
- Inter Process Communication mechanism is used in the program using POSIX shared memory
- fork system calls a new child process which runs concurrently with the parent process
- t0 and t1 are shared between child and parent process using mmap function which is a POSIX-compliant Unix system call that maps the memory .This means that writes to a mapped area in one process are immediately visible in all related processes hence mmap is used for inter process communication
- gettimeofday() function records the current time stamp.
- t0 stores the time just before the command is called in the child process.
- execlp() function is called to run the command in terminal and exit the child process.
- Wait() function-This command can be useful where part of a script can execute in parallel to implement a barrier where an upcoming section depends on the successful completion of the preceding sections.
- The parent process contains wait command for the child process to get completed successfully.
- t1 stores the time just after the command gets executed in the terminal.
- The variable "elapsed" stores the time difference between t1 and t0.
- Munmap() system call deletes the mappings for the specified address range .

ANALYSIS OF OUTPUT

The default search path for execlp() function (used when the environment does not contain the variable PATH) shows some variation across systems. It generally includes /bin and /usr/bin (in that order) and may also include the current working directory.

Hence the commands present in the above two paths get executed such as ls , gedit , apt-get , firefox , sudo apt-get install etc.

Elapsed time for the command to run is displayed on the terminal after the command gets executed.

Various commands were analysed 3 times and their time of execution came out as:-

