G5 Operating System

User Manual

Group 5
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Guide

This user manual will explain how to use the MPX system and the commands available. Each command section will explain what each command does.

Getting Started

1. To start using the MPX system the user must be in the correct folder. Open Ubuntu and type: *cd Group-5*
2. This will get the user into the correct directory. Next, to compile the system, type in two commands on separate lines: *make* and *./mpx.sh*
3. Now MPX will start up and the starting sequence should be displayed.

Clock

The clock functions are responsible for the Operating System's internal timing, and providing the user access to the time.

Get Time

- Type *gtime* to display the current time

Get Date

- Type *gdate* to display the current date

Set Time

- Type *stime* to set the time

Set Date

- Type *sdate* to set the date, month, and year

Manual / Help

The help function is supposed to be used for new users, or when the exact spelling or syntax of a command is unknown. Should enable all new users to understand the full scope of capabilities of the Operating System.

- Type *man* to display a full list of the available commands, as well as brief descriptions of each

Shutdown

Intended to be the best means to terminate the Operating System.

- Type *shutdown* and follow the prompt to terminate the terminal
  - Y - Confirms Shutdown
  - N - Reverts to the previous state

Version

The information regarding the current version of the Operating System, intended to provide the user information regarding the history of the Operating System.

- Type *vercom* to display the current version, as well as the date the version was published

PCB

A PCB (Process Control Block) is a data structure intended to store and execute multiple processes in an ordered fashion, and often utilizes queues, priority queues, linked lists, and other data structures to organize them.

- Type *createPCB* to establish a PCB. You will be asked to enter (Disabled)
  - Name (Maximum of 10 characters)

    - Class (System/User)
    - Priority Level (0 <highest> -9 <lowest>)
- Type *deletePCB* to remove a PCB from the queue determined by a name passed in by the user
- Type *blockPCB* to add a PCB to the blocked queue determined by a name passed in by the user
- Type *unblockPCB* to add a PCB from the blocked queue to the ready queue determined by a name passed in by the user
- Type *suspendPCB* to change the state of a PCB to suspended determined by a name passed in by the user
- Type *resumePCB* to remove a PCB from the suspended state and into the ready state determined by a name passed in by the user
- Type *setPriority* to set the priority of an existing PCB determined by a name passed in by the user to a number 0-9
- Type *showPCB* to display all information related to a specified PCB determined by a name passed in by the user
- Type *showReady* to display all information related to every PCB currently stored in the ready queue
- Type *showBlocked* to display all information related to every PCB currently stored in the blocked queue
- Type *showAll* to display all information related to all PCBs that currently exist

R3

This deliverable's objective is to implement cooperative multitasking on the operating system.

- Type *loadR3* to load the R3 test processes
- Type *yield* to cause the command handler to yield the CPU, displaying a message that each process was dispatched (Disabled)

- Command *createPCB* was disabled in this module to prevent other processes from interfering.

Alarm

This allows the user to set a custom alarm message that will go off at the next instance of the time designated by the user.

- Type *alarm* to prompt for a time and message.

Allocate Memory

Allocates heap memory and gives the address of the newly-allocated memory block. Returns an error message if it fails.

- Type *alloc* to prompt for a size to be allocated.

Free Memory

Free memory from the heap to be available for allocation once again.

- Type *free* to prompt for an address of a memory block in the heap to be freed.

Show Allocated Memory

Prints all information related to all current allocated blocks that exist within the heap.

- Type *showAlloc* to display all allocated blocks of memory in the heap and their associated information

Show Free Memory

Prints all information related to all current free memory spaces that exist within the heap.

- Type *showFree* to display all free portions of memory in the heap and their associated information