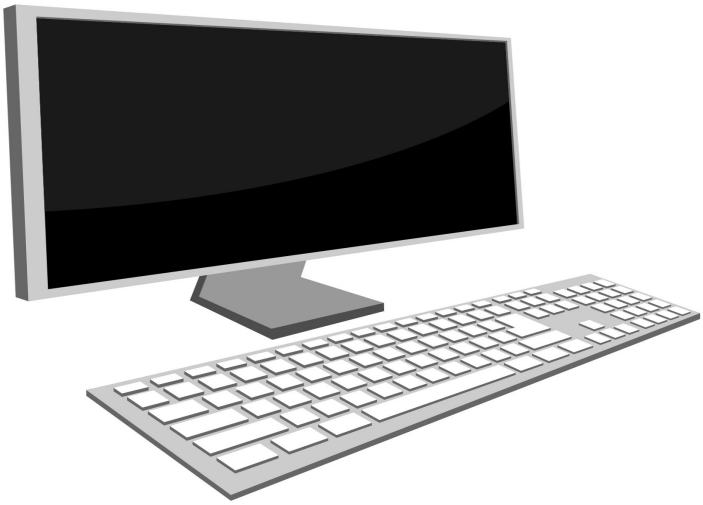
MPX-OS User's Manual
V-4.66 2019



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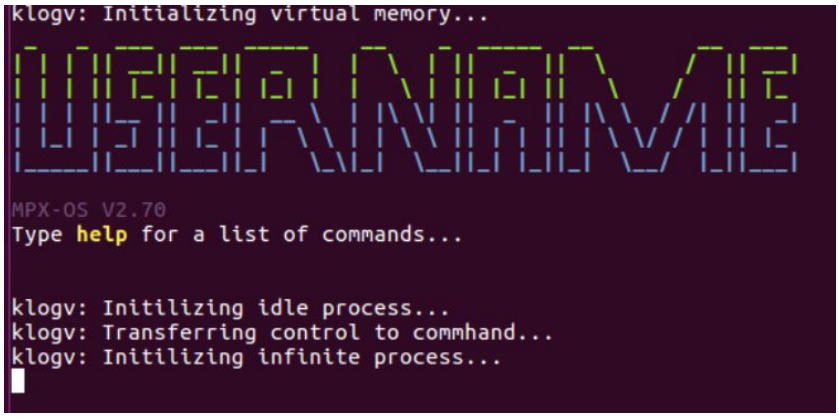
The Menu

MPX-OS is a menu-driven operating system. Once you have booted up MPX, you will be greeted with the USERNAME logo. Type help to get a list of valid commands or begin by writing out the command you want to execute.



Certain actions will prompt you with another menu that will look similar to this, simply repeat the same process.
If you use the clear command, the terminal will be cleared of all previous inputs and outputs.

Help

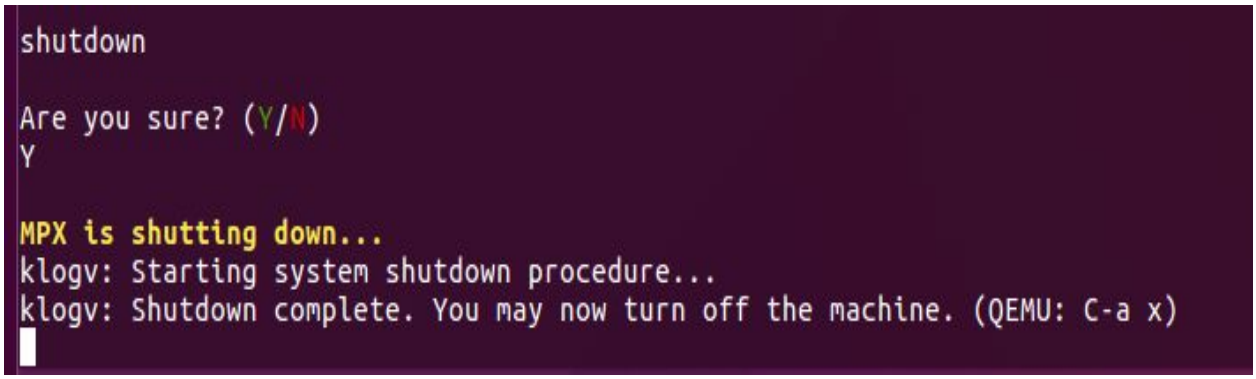
If you want to perform a certain action but do not know what the command(s) is to help you accomplish it, you can simply type “help”, and you can see a list of all available commands.

To get information on a specific command, type help followed by the name of the command you want information on.

Example: help set-time

Shutting Down MPX-OS

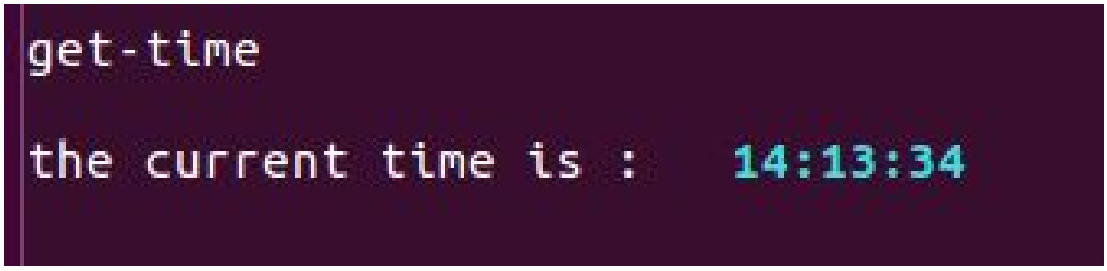
Shutting down your operating system is a very simple process. Simply type “shutdown”, and then you will be prompted again to confirm that you do in fact want power off your device. Type ‘Y’ for yes and ‘N’ for no.
If your device shuts down properly, you should see a display similar to that of the image below.



Displaying the Current Time

To check the time on MPX, all you will need to do is type “get-time” . This will display a time in HH:MM:SS format.

An Example of this is seen below:



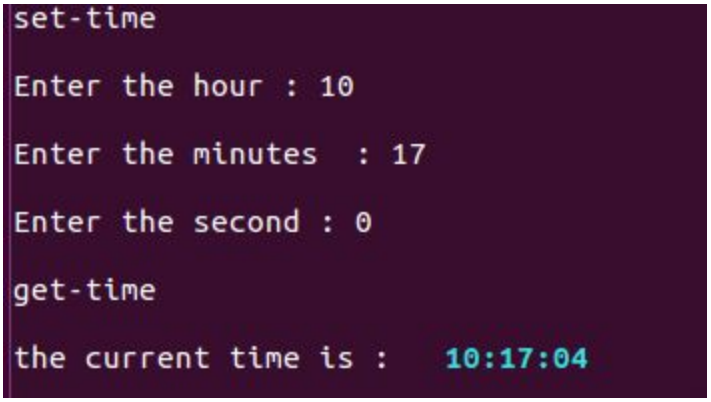
Checking the Date

Checking the date is a simple and easy as checking the time in MPX-OS! To check the date in MPX, all you will need to do is type “get-date”. This will display the current date in MM/DD/YY format.

An Example is seen below:

Setting your clock

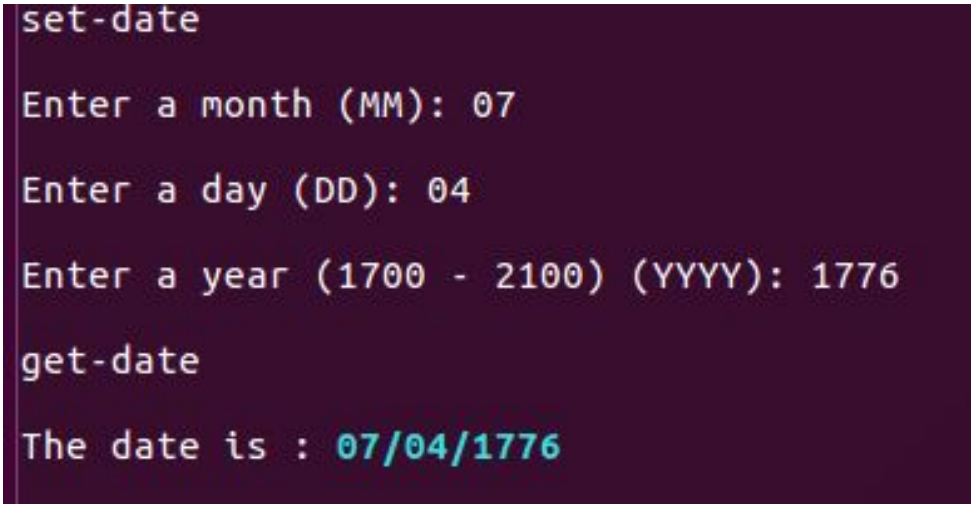
If the time displayed on your device is incorrect, you can change it through MPX's main menu. First, type "set-time" and then you will be prompted to enter in the Hour, Minute, and Second one at a time. Please note that this uses a 24-hour clock (11 pm = 23).



Also note that if you hit Enter without submitting a number, then MPX will default that value to 0.

Setting the Date

Setting the date is much like setting the time. First,type “set-date” and then you will be prompted to enter in the Month, Day, and Year one at a time, pressing the enter button in between each value. Note that this is in MM/DD/YY format. If a Day value beyond the number of days in the Month is entered, an error message will be displayed and you will have to redo this process. Same if the month exceeds 12 or the Year is less or more than four digits.



Creating a Process Control Block - User Restricted

To create a new process, type “create-pcb” and then enter.
You will then be prompted to provide a name (between 8 and 16 characters in length), a class (1 for user, 0 for system) and a priority.

```
create-pcb

Please Enter a name for the process:    system_process32

Please Enter the class [ 0 for system process, 1 for user process]:     0

Please Enter the priority [ 0 being the lowest, and 9 being the highest]:       3
```

The process control block created above can be seen in the MPX OS in the following format. NOTE: All process control blocks are not suspended or blocked by default.

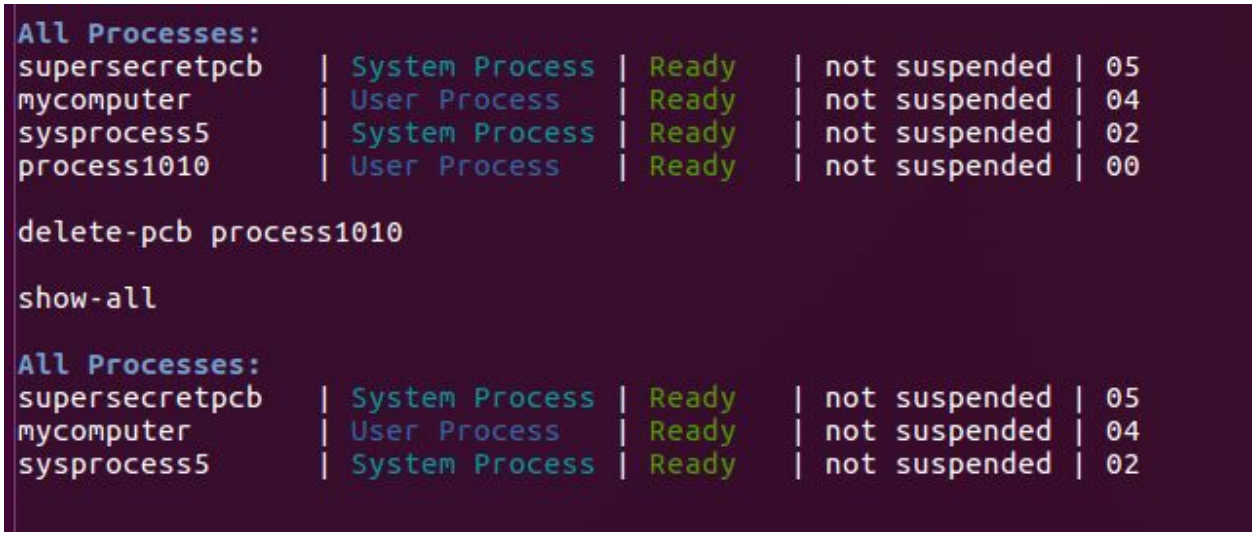
```
system_process32 | System Process | Ready    | not suspended | 03
```

Deleting a Process Control Block - User Restricted

Deleting a process is very simple. The command takes a process name as an argument in the following UNIX-like format

delete-pcb [process name]

An example is shown below:

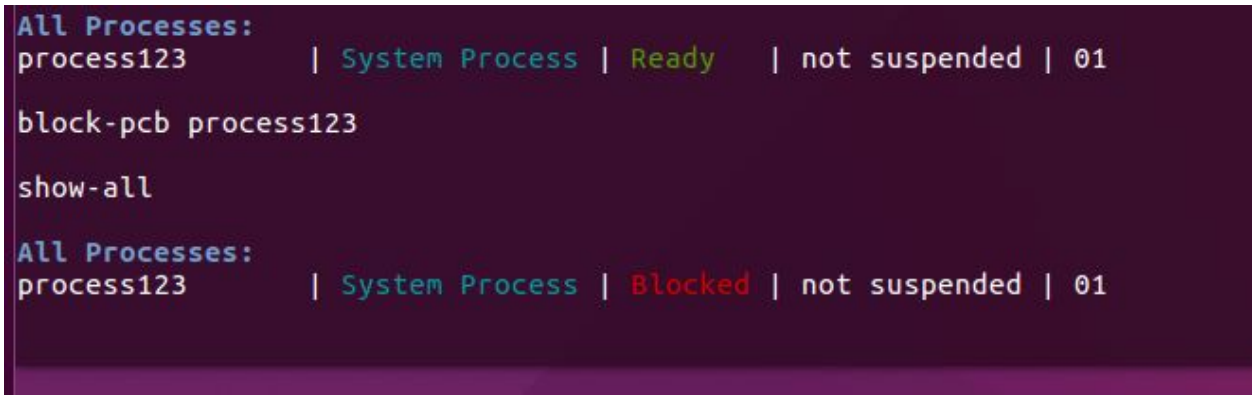


Blocking a Process Control Block - User Restricted

To block a process control block you follow the same set of instructions as you would for deleting one.
The Command is:

block-pcb [process name]

And example is shown below



Notice how the PCB goes from a green “ready” to a red “blocked”

Unblocking a Process Control Block - User Restricted

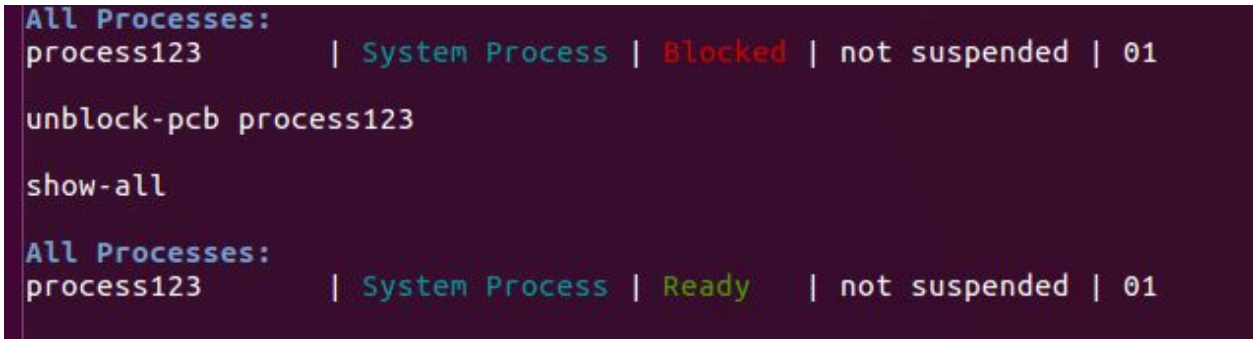
After you blocked a process, you might say to yourself: “ah gee wiz I sure wish I hadn’t blocked that PCB!”

Well don’t fret, you can unblock it JUST AS EASILY!

Command:

unblock-pcb [process name]

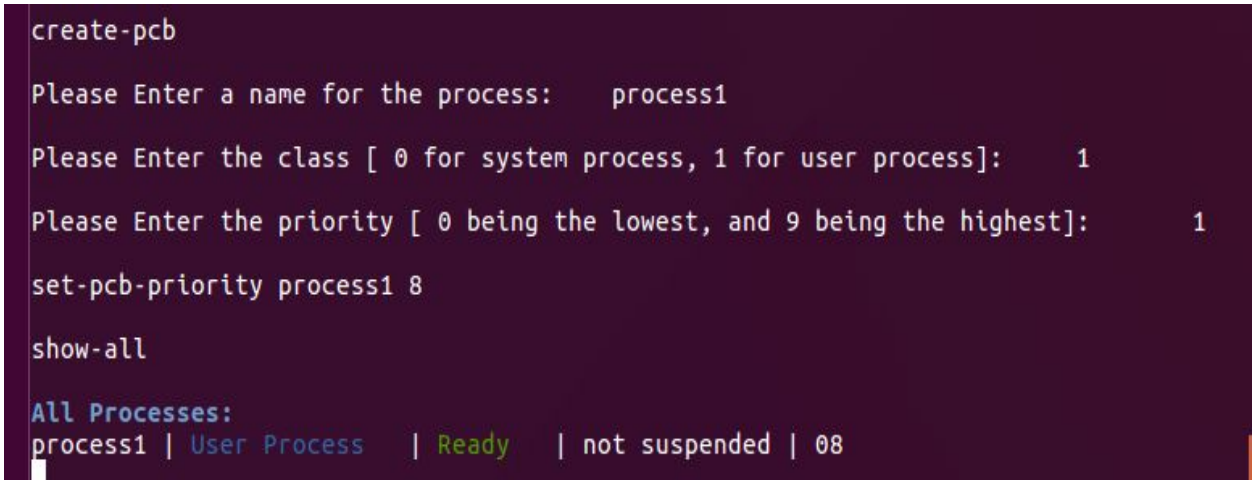
Example:



Updating the Priority of a Process

Once you've created a PCB and set it's priority, you may decide to change it's priority. To do this, you must enter the following command.

set-pcb-priority [process name] [int 0-9]
EXAMPLE: set-pcb-priority process1 3



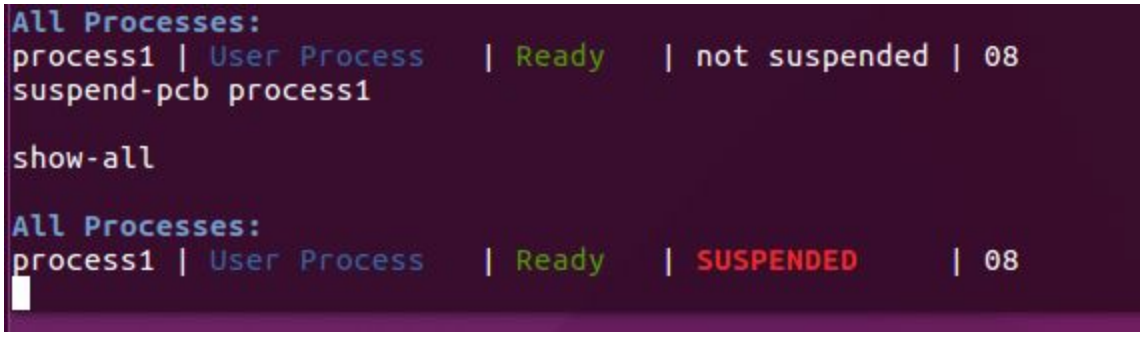
Suspending a PCB

Suspending a PCB is simple.

Command:

suspend-pcb [process name]

Example:

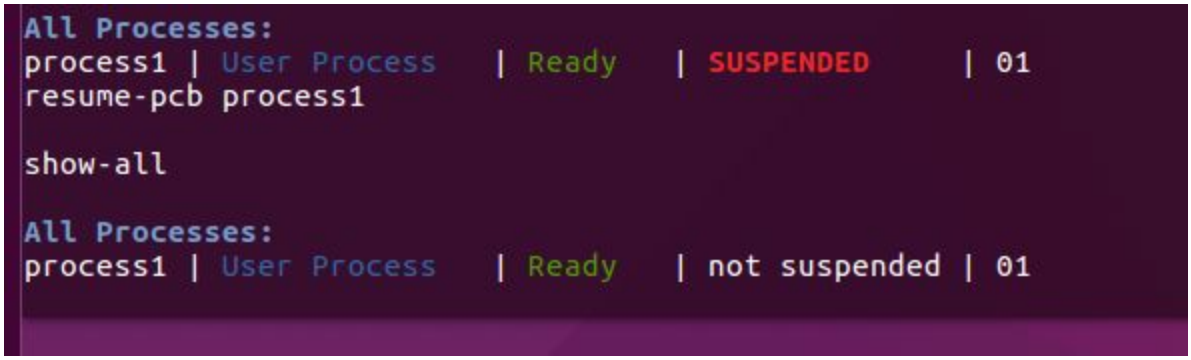


Resuming a PCB

Once a PCB is suspended, it will eventually need to be resumed. Doing this is as simple as suspended it.

Command:
resume-pcb [process name]

Example:



Displaying Processes

You may want to display the processes on your MPX OS. You have four different ways you can do this.

Showing 1 process: show-pcb [process name]

Showing all processes: show-all

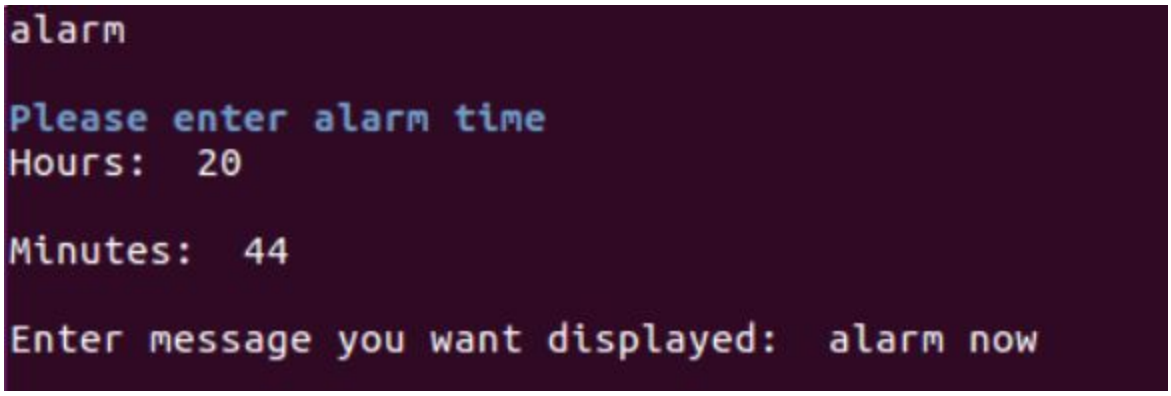
Showing ready processes: show-ready

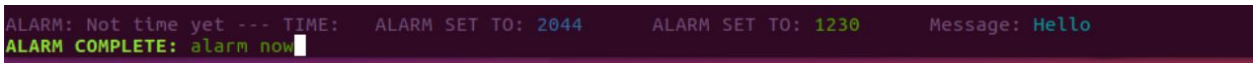
Showing blocked processes: show-blocked

```
show-all

All Processes:
process2 | System Process | Ready   | not suspended | 04
process3 | System Process | Ready   | not suspended | 03
process7 | User Process   | Ready   | SUSPENDED     | 05
process1 | User Process   | Ready   | SUSPENDED     | 01
process5 | System Process | Ready   | not suspended | 00
process1 | User Process   | Ready   | SUSPENDED     | 01
process6 | User Process   | Blocked | not suspended | 02
process4 | User Process   | Blocked | not suspended | 02
show-ready

process2 | System Process | Ready   | not suspended | 04
process3 | System Process | Ready   | not suspended | 03
process7 | User Process   | Ready   | SUSPENDED     | 05
process1 | User Process   | Ready   | SUSPENDED     | 01
process5 | System Process | Ready   | not suspended | 00
process1 | User Process   | Ready   | SUSPENDED     | 01
show-blocked

process6 | User Process   | Blocked | not suspended | 02
process4 | User Process   | Blocked | not suspended | 02
show-pcb process1

process1 | User Process   | Ready   | SUSPENDED     | 01
QEMU: Terminated
```

Alarm

The MPX now supports adding alarms that can be used to display a message at certain times of the day specified by the user.
To use this feature, type “alarm” and follow the prompts to enter the alarm’s execution time and the message you want to display. Once the time has elapsed, your message will display. An example is shown below.





The first image is an example of how to enter the alarm, the second is an example of an alarm that has not executed yet, and an alarm that has executed.

Yield - User Restricted (TESTING ONLY)

Yield is a system-only function that calls sys_call which checks the ready queue for another process to be loaded into the current operating process PCB. This will not be used by the user…

Loadr3 - User Restricted (TESTING ONLY)

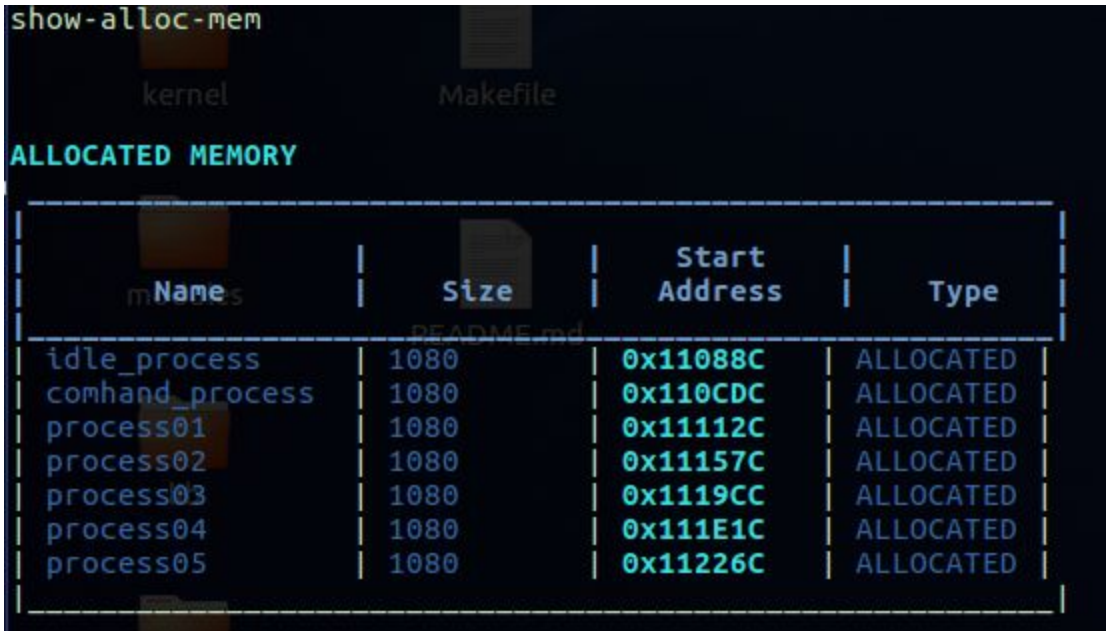
This function loads five test processes into the suspended-ready queue for testing purposes.

memtest - User Restricted (TESTING ONLY)

This function allocates a PCB into memory, displays all memory, and then deletes the PCB and displays the memory again.

Show Allocated Memory

You can display all allocated memory blocks in MPX-OS using the command “show-alloc-mem”. This displays a table where the rows are each memory block and the columns are respectively the name, size, address, and memory type.



Show Free (Available) Memory

You can display all Free memory blocks in MPX-OS using the command “free-alloc-mem”. This displays a table where the rows are each free memory block and the columns are respectively the size, address, and memory type.