Timeline of Processes on MLFQ Scheduler

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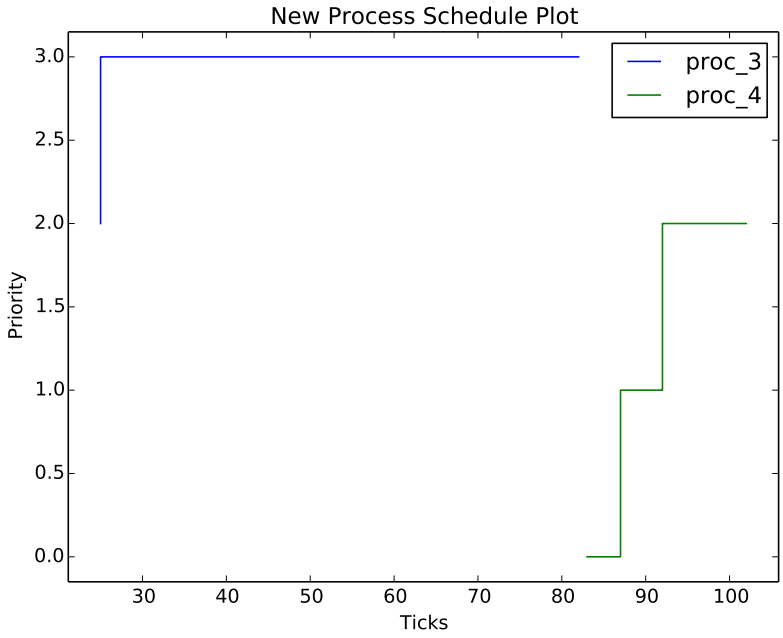
1 Introduction

We have considered four different scenarios to observe the behaviour of our scheduler. For each of these four scenarios, graphs have been plotted, workload has been described and brief explanations have been given. Details of which process runs at each tick can be found in the individual folders of that particular scenario.

2 Graph: New Process



2.1 Description

There is a shell running and a new process is created in the shell.

2.2 Graph explanation

We observe that before the process is created, the shell is the only working process on the CPU. When a new process is created, it first enters priority 0. It moves to priority 1 when its time-slice is finished i.e, after 5 ticks. Similarly at priority 1, it runs for 5 ticks and then moves to priority 2.

3 Graph: Multiple jobs

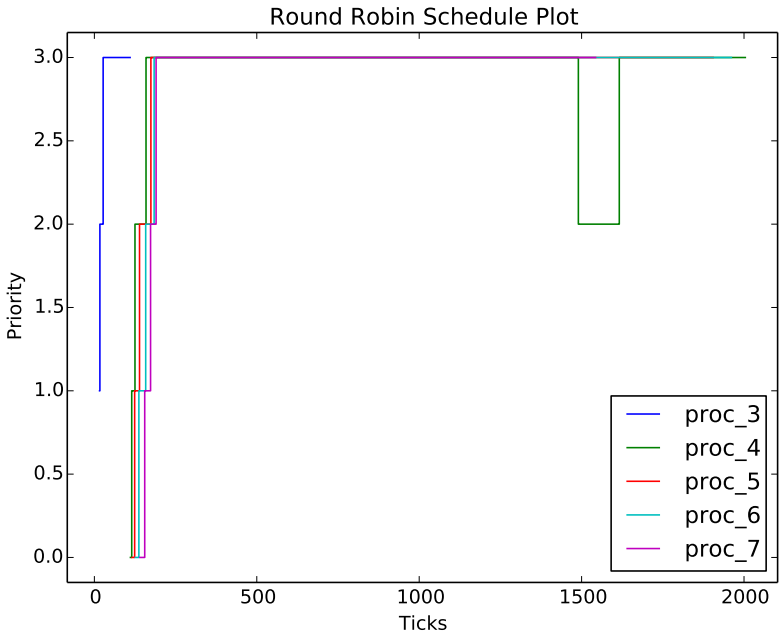
3.1 Description

Synchronous workload has been presented to the MLFQ scheduler and each process has been given an increasing workload. 18 processes are run.

3.2 Explanation

We observe that whenever a new process enters, it enters priority 0 and then moves to priority 1,2 and 3. Also each process runs only for the duration of their time-slice at each priority level

4 Graph: Round Robin



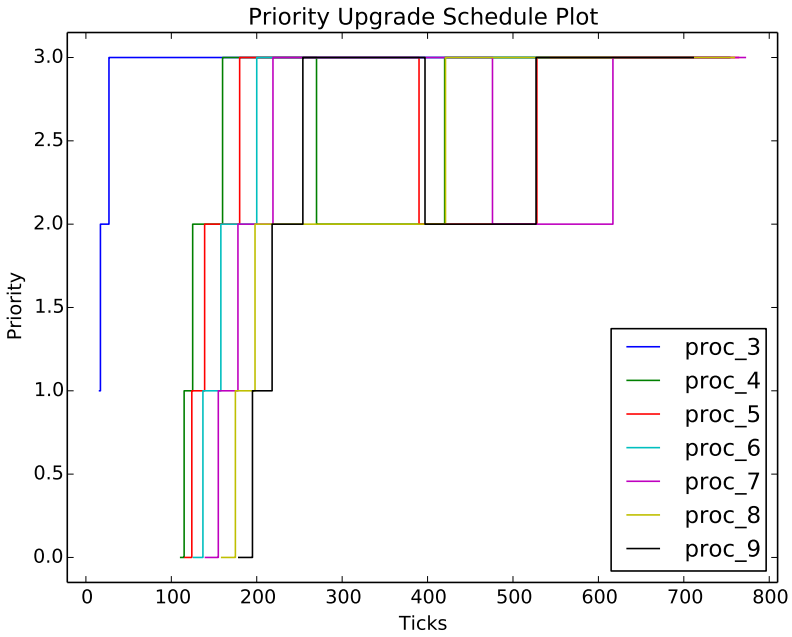
4.1 Description

Long running processes are run on the MLFQ scheduler to determine whether they were exhibiting round robin pattern. Four processes are used

4.2 Explanation

The one in the blue (proc 3) is the shell which is the parent process and is run first on the scheduler. We observe that between ticks 250 and 1600, the four processes round robin on the scheduler. This is much clear in the individual ticks files present in the xv6/plots/Round Robin folder. Also, green(proc 4) which was not scheduled for over one second is bumped up from priority 3 to priority 2. Over here it runs for one time-slice and then moves back to priority 3.

5 Graph: Priority Update



5.1 Description

Six very long running processes are scheduled on the MLFQ scheduler. Longer than the workload in roundrobin.

5.2 Explanation

Blue (proc 3) is again the shell process. Green (proc 4) gets upgraded around the 300th tick. Similar to proc 4 other processes also get upgraded whenever they are not scheduled in the previous one second time interval.