

Report: Project 3

Denny Shen

dennyshe@usc.edu

ID: 2491547502

- Describe changes to the xv6. Name the files your modified, briefly describe the changes.

pstat.h:

- Added provided new header file

proc.h:

- Included the provided header file "pstat.h"
- Added necessary properties to the proc struct
 - Ticks, total_ticks, ticks[3], times[3], wait_time, stat_occupied, sche_stat
- Added 3 queue structures and their counters

proc.c:

- Initialize process priority queues
- allocproc():
 - Before found (after found unused proc), initialize(reset) scheduler and process properties
 - In found, added 3 loops for the 3 priority queues to find unused processes and delete them
- userinit():
 - Reset schedule stats before calling allocproc()
- scheduler():
 - Added 3 major schedule for loops. For each priority queue, adding process to the queue (drop its priority if it consumes its allocated times and ticks), and boost the process if it waits for a long time
- boost():
 - if a process is in the lowest priority queue for a long time (over 50 ticks), boost it to the highest priority queue q0

trap.h:

- Update the ticks property of the process in a given priority queue, and yield under conditions where the priority and ticks

user.h:

- Added int getpinfo(int);

syscall.h:

- Added #define SYS_getpinfo 22

syscall.c:

- Added extern int sys_getpinfo(void); and [SYS_getpinfo] sys_getpinfo in the syscall vector

sysproc.c:

- Declared sys_getpinfo function to fetch the one integer argument

usys.S:

- Added SYSCALL(getpinfo)

Test1:

- Added test 1 to test function of priority mechanism

Test2:

- Added test 2 to test starvation prevention

Test3:

- Added test 3 to test if one process hang onto q0/q1

Makefile:

- Added the 3 tests to the Makefile