

Signal Handling

Assignment 6 Report

Group 16

14CS30011 - Kaustubh Hiware

14CS30017 - Surya Midatala

Files changed:

src/threads/thread.c :

src/threads/thread.h

src/threads/signal.c

src/threads/signal.h

src/Makefile.build

Data structures added/changed:

struct signal_t (in signal.h):

1. int type -- type of signal being sent
2. int sent_by -- tid of the sender
3. struct list_elem threadelem -- thread element of receiving thread

struct thread (in thread.h):

1. long long lifetime -- lifetime ticks of thread
2. long long ticks -- current ticks
3. struct hash_elem hash_elem --
4. int parent_tid -- tid of parent thread
5. int children_created -- total children created by thread
6. int children_alive -- number of children created by thread still alive
7. struct list_elem elem1 -- a list element

8. struct list signal_list -- list of all signals except unblock signal
9. sigset_t mask -- signal mask of thread

Design :

The signals are stored in two queues; wait_unblock_list and signal_list. wait_unblock_list stores all the blocked threads ready to be unblocked whereas signal_list contains the remaining signals.

The signals are:

- SIG_CHLD: this is called when a child is exited and the parent is still alive
- SIG_KILL: called by the kill() function
- SIG_CPU: called by the OS when a thread's ticks count exceeds its lifetime
- SIG_UNBLOCK: called by the kill() function
- SIG_USR: called by the kill() function

The signals are handled after thread_schedule_tail in the schedule() function. We traverse through the signal_lists of all the threads and handle the signals by calling the respective handlers.