Processes and Threads

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V1.0

Introduction

An introduction to what processes are and what they are comprised of. Followed by a more in-depth examination of threads, their concept, usefullness and finally how you create your own using a POSIX compliant API as that which is available in Linux.

Content and reflection

Themes

- Parallel programs - A case study[1]
- Processes
  - Basics[2, Chap. 4][1]
  - Virtual Memory[1][4][3, Chap. 4, p. 131-141]
    Take special of note of the reference [3, Chap. 4], since the title does not refer to the actual filename, however 'Virtual Memory.pdf' does as denoted in the comment.
  - Anatomy of process [1][4]
- Threads
  - Models[2, chap. 5][1]
  - Posix threads (using 'em)[6, chap. 29]
  - Why threads[5]

Questions

- Processes
  - What is a virtual memory
  - What purpose does the MMU serve
  - What is a scheduler
  - What is the context concept and what happens when a *context switch* occurs
  - What are the different sections which a processes can be dissected into - its anatomy
  - Which states can it be in - birth, life & death (more to it than that)
- Threads
  - What is a thread
  - Why do you want to use threads
  - What kind of trouble do they present
  - Threading model
    * Which models exists
    * Their properties
- Using threads in Linux
  - What is a *function pointer* or *call back function*

- How do you create a thread
- How do you terminate a thread

Material

Slides

[1] S. Hansen, *Parallel programs, processes and threads*, Slides - see course repos.

Local repository

[2] R. B. Muhammed, *Introduction to operating systems*, TFJ composed a pdf based on the text from: http://www.personal.kent.edu/%7ermuhamma/OpSystems/os.html.

[3] S. E. David Mosberger, *IA-64 Linux Kernel: Design and Implementation*. Prentice Hall, 2002, Only one chapter - Chapter 4 Virtual Memory, filename: Virtual Memory.pdf, ISBN: 978-0-13-061014-0.

Online

[4] G. Duarte. (). Anatomy of a program in memory, [Online]. Available: `http://duartes.org/gustavo/blog/post/anatomy-of-a-program-in-memory/`.

[5] H. Sutter. (). The free lunch is over, [Online]. Available: `http://www.gotw.ca/publications/concurrency-ddj.htm`.

Hardback

[6] M. Kerrisk, *The Linux Programming Interface*. No Starch Press, Inc, 2010, ISBN: 978-1-59327-220-3.