ADVANCED OPERATING SYSTEMS

TAUGHT BY

- prof. manish srivastava

COURSE TOPICS

- history of operating systems
- processes and OS abstractions
- OS APIs
- interrupts and system calls
- introduction to linux Kernel.
- compiling the Kernel.
- module programming
- writing your own system calls
- Overview of Kernel startup and initialization.
- Kernel debugging techniques
- interoropts

- PICs

9

- APICs

10

- exceptions (traps) and hard interrupts

11

- IDTs

12

- address spaces and loading

1

- virtual memory

2

- memory allocators

3

- overview of memory spaces

4

- logical segmentation

5

  - linear virtual

6

  - actual physical

7

- detecting BIOS provided physical RAM map.

Sunday 15

- paging

- buddy system

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16 Monday

- setting up page directories
  - global
  - upper
  - middle
- tables
- PTEs
- (N)UMA nodes
- zone
- memory types
- setting up buddy system
- allocating contigues pages from buddy system.
- setting up slabs for small memory objects.
- CPU scheduling
- threads
- process

- structures

- organization

- initialization

• Concurrent programming

- locking

- deadlocks

• Structures

- thread union

- thread info

- stack

- task

- thread struct

• Creating kernel threads

• Using kthread

• Kernel process scheduling

- scheduling processes with red-black tree
- process switching
- context switches
- switching to suspended process
- linux file systems
- disk scheduling

TEXTBOOKS

1. operating systems : principles & practice; anderson. (2014)
2. understanding the linux kernel; bovet. (2005)
3. operating systems: three easy pieces; dusseau. (2018)
4. linux device drivers; corbet. (2005)
5. linux kernel development; love. (2010)
6. linux in a nutshell; siever. (2009)