CSE 506
Graduate OS

Introduction

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Why Grad OS?

- Primary Goal: Demystify how computers work

An example progression

- Undergrad OS:
  - High-level understanding of paging
  - Theoretical issues like fragmentation
- Grad OS (506): Build a pager
  - Solid understanding of how paging SW + HW work
- Advanced Grad OS (624): Read novel research papers
  - Do creative things with paging: virtualization, security, etc

506: Learn by doing

- You will write major chunks of your own OS
  - Memory management, context switching, scheduler, file system, IPC, network driver, shell, etc.
- Linux scheduler:
  - Difficult to understand just by reading source
  - Small modifications require first understanding the code
  - Impossible to replace/reimplement
- No substitute for building it yourself!
JOS

- Developed at MIT, used at several top schools
- The “J” is for Josh Cates, not Java
- In C and Assembly, boots on real PC hardware
- You get the skeleton code, fill in interesting pieces
- Build the right intuitions about real OSes
- but with much simpler code

Labs, cont.

- This course is coding intensive
- You should know C, or be prepared to remediate quickly
- You will learn basic, inline x86 assembly
- You must learn on your own/with lab partner
- The lab is difficult, but worthwhile
- You will want to commemorate, with a T-shirt, tattoo, etc.

Last Lab

- Includes open ended project
- Can add significant feature to JOS
- Or do a research task on another system
- Plan ahead – proposals due 11/08

CSE 522

- This course can also count as your MS project course (CSE 522)
- Requirements: Same as 506, except:
  - You must do the labs alone
  - You must complete 1 challenge problem in each lab
  - To enroll: you must first be in 506
  - Ask me and I will have you moved to 522
No Textbook

- You're welcome
- Several recommended texts
  - Several free on SBU safari online site
  - Others on reserve at library
  - Required readings will mainly be papers you can print out

Lectures

- Compare and contrast JOS with real-world OSes
  - Mostly Linux, some Windows
  - Supplement background on hardware programming
  - Common educational gap between OS and architecture

Prerequisites

- Undergrad OS
  - In some cases, industry experience is ok
  - Worth brushing up if it has been a while
  - In-class quiz, due before you leave
    - If you can't answer 50% of these questions, consider undergrad OS
- C programming
- Basic Unix command-line proficiency
- See me if you have already done the JOS lab, or similar

Space in the class

- Wait list is currently full
- Grad students often over-enroll
  - Space likely to open up in first week
  - If you want in, keep showing up for a few lectures
- Worst case: Prof. Zadok teaching 506 in spring
  - Likely to be offered every semester going forward
Course email list

- Sign up at http://lists.cs.stonybrook.edu/mailman/listinfo/cse506
- This is the primary announcement medium
- And for discussions about course work
  - Do not post code here or other solutions
  - Goal: Everyone can learn from general questions
- Material discussed on the mailing list can be an exam question

Other administrative notes

- Read syllabus completely
- Subscribe to the class mailing list
- 2 exams cover: lectures, labs, mailing list
- Every student will get a VM for lab work
  - You may use your own computer, staff can't support it
- All staff email goes to cs506ta@cs.stonybrook.edu
  - Except private issues for instructor only

Lab partners

- Self-selected
  - Lab mailing list good for finding them
- Same for entire course
  - Changes only with instructor permission
- Can work alone, but better with help
- List partner in first lab submission

Academic Integrity

- I take cheating very seriously. It can end your career.
- In a gray area, it is your job to stay on right side of line
- Never show your code to anyone except your partner and course staff
- Never look at anyone else's code (incl. other universities)
- Do not discuss code; do not debug each other's code
- Acknowledge students that give you good ideas
Lateness

- Each group gets 72 late hours
- List how many you use in slack.txt
- Each day after these are gone costs a full letter grade on the assignment
- It is your responsibility to use these to manage:
  - Holidays, weddings, research deadlines, conference travel, Buffy marathons, release of the next Zelda game, etc.
  - 3 Exceptions: illness (need doctor’s note), death in immediate family, accommodation for disability

Lab 1 assigned

- Due Friday, 9/9 at 11:59 pm, eastern.
- Instructions on website
- Quick demo

Getting help

- TA’s (TBD) will keep office hours
- Instructor keeps office hours
  - Note that “by appointment” means more time available on demand

Questions?