Reminders
- Project 4 due tomorrow, 4:00pm
- Review lecture tomorrow

Today:
- Project 4 questions
- Some practice for the exam
- Evaluations

HW5 + Project 3 + all old stuff back
- HW5 average: 70/80
- Project 3 average: 44.8/50

Project 4 questions
- General?
- Filename length?
- File size?
- File length?

Review: file systems
- Two improvements BSD Fast File System implemented?
- Name one disadvantage of RAID 0
- Name the type of system and workload that LFS was based on
- Max UNIX file size for 1K blocks?
- The sequence of actions that occurs when a user executes the following, in terms of inodes and directory entries: touch file file in file file2 rm file file rm file2

Review: file systems
- Two improvements BSD Fast File System implemented?
  - Cylinder groups, blocksize 1->4K, disk params
  - Name one disadvantage of RAID 0
    - No redundancy – data loss possible
  - Name the type of system and workload that LFS was based on
    - Frequent writes with lots of small files
  - Max UNIX file size for 1K blocks?
    - (10+256+256+10+256+3)*1K = around 16 GB
    - But what about file handles?
  - The sequence of actions that occurs when a user executes the following, in terms of inodes and directory entries: touch file file in file file2 rm file file2

Review: virtual memory
- Segmentation doesn’t have this problem of wasted space.
- How does copy-on-write work? What is it used for?
- What is Belady’s anomaly?
- Number of references the first load will produce on x86 on powerup.

Review: virtual memory
- Segmentation doesn’t have this problem of wasted space.
  - Internal fragmentation
  - How does copy-on-write work? What is it used for?
  - ... 
  - What is Belady’s anomaly?
    - Bad property of FIFO = fault rate can increase with more allocated frames
  - Number of references the first load will produce on x86 on powerup.
    - Two-level PT: 3
Review: Networks + Security

- What does the network stack look like?
- Name a few functions provided by TCP
- What is RPC good for?
- What is the difference between authentication and authorization?
- How can you detect someone stole your password?
- Why does Windows require ctrl+alt+del before you type your username/password?

- What does the network stack look like?
- Name a few functions provided by TCP
- Reliability, flow control, congestion control
- What is RPC good for?
- What is the difference between authentication and authorization?
  - Authentication = identify users/programs
  - Authorization = track user’s read/write access to different objects
- How can you detect someone stole your password?
  - Last login time, etc.
- Why does Windows require ctrl+alt+del before you type your username/password?
  - Protect against login spoofer

Last slide

- Good luck on the exam!
- Congratulations on making it through a tough class!