Operating Systems

Introduction

What is an Operating System?

Why care about OS? (1)
You, the CS major

- Most critical software in a computer.
- OS performance influences the performance of all software on a computer
  - How to extract the best performance out of an OS?
  - How to work around design flaws? Write software that takes advantage of the design of the OS

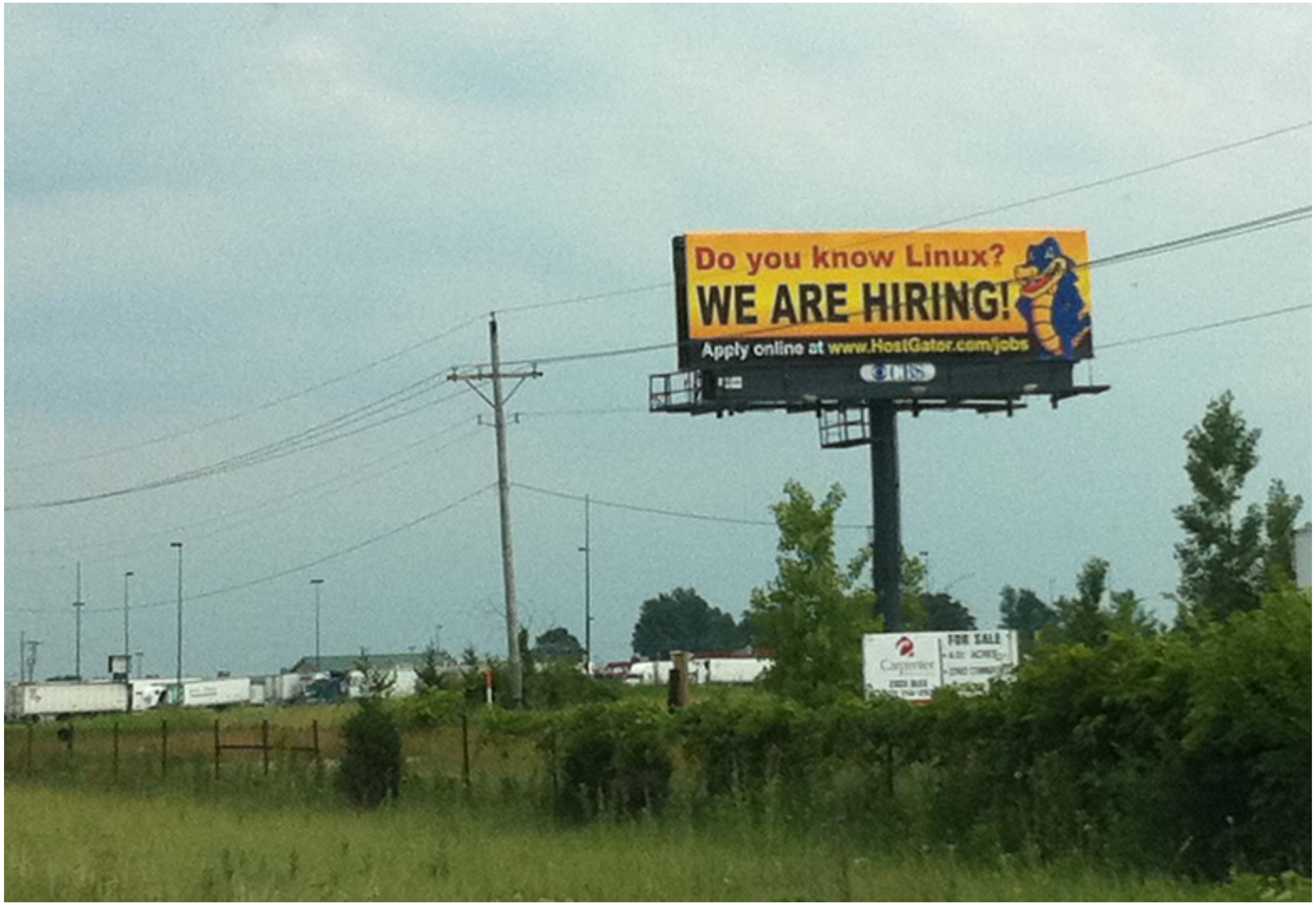
Why care about OS? (2)
You, the informed computer user

- You need to understand enough to make informed decisions about things like **buying and using a personal computer**
  - Why do different platforms with the same CPU perform differently?
  - Should I get Windows XP? Windows Vista? Linux? Mac? What’s the difference?
  - Should I upgrade my hardware? Should I upgrade my OS?
  - What’s going on with my PC, especially when I have to install something?
  - Should I use disk compression? Is there a cost to using it?

Why care about OS? (3)
You, the good programmer

- If you' re going to be a software engineer then you' ll need to understand the environment offered by your OS :
  - What **abstractions** does the OS provide? E.g., the OS may (or may not) provide illusions such as infinite number of CPUs, infinite memory, single worldwide computing, etc.
  - What **system design trade-offs** have been made? E.g., what functionality has been put in hardware? What trade-offs have been made between simplicity and performance, putting functionality in hardware vs. software, etc?
  - **Operating system design and implementation** combine many different areas of computer science – languages, hardware, data structures, and algorithms.

Why care about OS (4)
You, the grown-up



Why is this Class Difficult?

- An OS is a **very complex software system**
  - Rich basic concepts
  - Hundreds of thousands, millions lines of code
- Builds on previous knowledge
  - Computer organization
  - Programming (especially in C)
  - Data structures
  - Algorithms