

**CSE 451: Operating Systems
Winter 2007**

**Module 1
Course Introduction**

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Today's agenda

- Administrivia
 - course overview
 - course staff
 - general structure
 - the text
 - policies
 - your to-do list
 - course registration
- OS overview
 - functional
 - resource management, etc.
 - historical
 - batch systems, multiprogramming, timeshared OS's, PCs, networked computers, p2p, embedded systems

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Course overview

- Everything you need to know is on the course web page:

<http://www.cs.washington.edu/451/>

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- But to tide you over for the next hour ...

- course staff
 - Brian Bershad
 - Epilepsia Aziel
 - Marissa Roden
- general structure
 - read the text prior to class
 - class will supplement rather than regurgitate the text
 - homework exercises provide added impetus to keep up with the reading
 - sections will focus on the project (several separate components)
 - we really want to encourage *discussion*, both in class and in section

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- the text
 - Silberschatz, Galvin & Gagne, *Operating System Concepts*, **seventh edition**
 - if using an earlier edition, watch chapter numbering, exercise numbering
- other resources
 - many online
 - some required
 - some optional
 - some prohibited (!)
- policies
 - collaboration vs. cheating
 - homework exercises
 - late policy

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- your to-do list ...
 - please read the entire course web thoroughly, *today*
 - please get yourself on the cse451 email list, *today*, and check your email *daily*
 - keep up with the reading
 - homework 1 (reading + problems) is posted on the web now
 - reading due Friday
 - problems due at **the start of class** on Monday
 - project 0 is posted on the web now
 - will be discussed in section on Thursday
 - due at **the start of class** next Wednesday (but if you don't get started this week you'll be in trouble)

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Course registration

- If you're going to drop this course
 - please do it soon!
- If you want to get into this course
 - plan for the worst case
 - but, make sure you've filed a petition with the advisors
 - they run the show!
 - give things a few days to settle down

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What is an Operating System?

- The text:
 - "an intermediary between the user of a computer and the computer hardware"
 - "manages the computer hardware"
 - "each [piece] should be ... well delineated ..., with carefully defined inputs, outputs, and functions"
 - "an amazing aspect of operating systems is how varied they are in accomplishing these tasks ... mainframe operating systems ... personal computer operating systems ... operating systems for handheld computers ..."
 - "in 1998, the United States Department of Justice filed suit against Microsoft, in essence claiming that Microsoft included too much functionality in its operating system ... for example, a web browser was an integral part of the operating system"

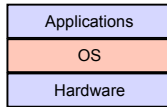
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What is an Operating System?

- An operating system (OS) is:
 - a software layer to abstract away and manage details of hardware resources
 - a set of utilities to simplify application development



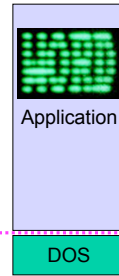
- “all the code you didn't write” in order to implement your application

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What is Windows?

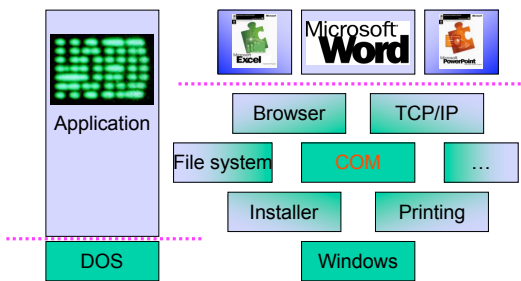


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What is Windows?

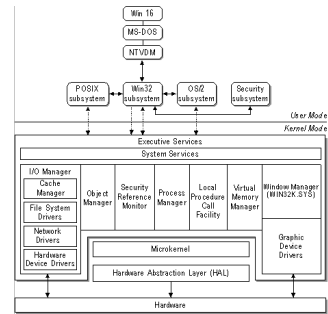


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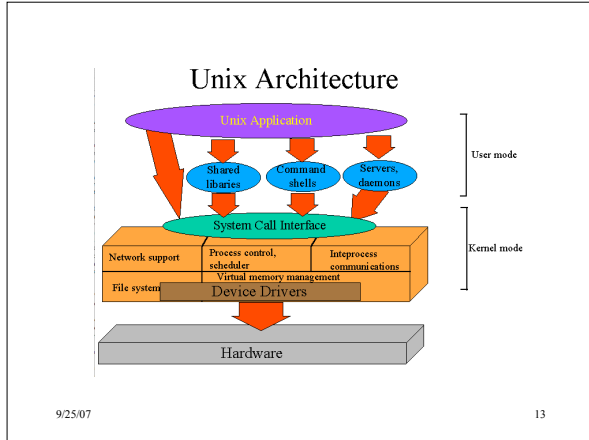
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What is Windows Really?



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- ### The OS and hardware
- An OS **mediates** programs' access to hardware resources (*sharing and protection*)
 - computation (CPU)
 - volatile storage (memory) and persistent storage (disk, etc.)
 - network communications (TCP/IP stacks, Ethernet cards, etc.)
 - input/output devices (keyboard, display, sound card, etc.)
 - The OS **abstracts** hardware into **logical resources** and well-defined **interfaces** to those resources (*ease of use*)
 - processes (CPU, memory)
 - files (disk)
 - sockets (network)
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- ### Programming an OS
- C is the Language of Choice
 - High enough level to hide most hardware attributes
 - Portable
 - Abstractable
 - Programmable
 - Modular
 - Low enough level to reveal most hardware attributes
 - Efficient
 - Predictable
 - Controllable
 - Magicable
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- ### CSE 451
- In this class we will learn:
 - what are the major components of most OS's?
 - how are the components structured?
 - what are the most important (common?) interfaces?
 - what policies are typically used in an OS?
 - what algorithms are used to implement policies?
 - Philosophy
 - you may not ever build an OS
 - but as a computer scientist or computer engineer you need to understand the foundations
 - most importantly, operating systems exemplify the sorts of engineering design tradeoffs that you'll need to make throughout your careers – compromises among and within cost, performance, functionality, complexity, schedule ...
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