

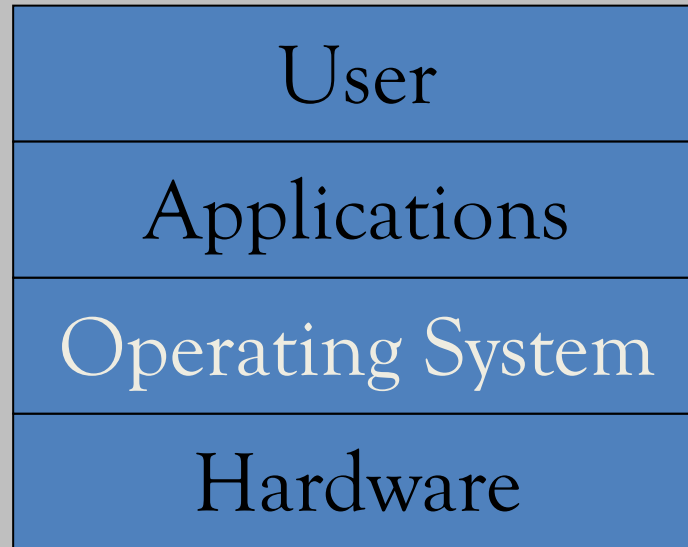
Operating Systems: Overview

OSTEP Chapter 2:

<http://pages.cs.wisc.edu/~remzi/OSTEP/intro.pdf>

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What is an operating system?



Operating System:

Software that converts hardware into a “useful form” for applications

Roles of operating systems

Role 1: Abstraction – Standard library for hardware resources

Which abstraction do operating systems provide?

- CPU:
Processes and threads
- Memory:
Address space
- Hard disk/Solid state disk:
File system

Advantages of these abstractions:

- Hiding complexity;
different devices look the same
(analogous to ISA vs
microarchitecture)
- Provide an “extended”
machine with increased
functionality

Roles of operating systems

Role 2: Resource management

Goals of the operating system:

- **Security**
Protecting different applications from each other
- **Efficiency:**
efficient use of shared resources
- **Fairness:**
fair access to resources

Three areas

- *Virtualization:*
CPU + Memory
- *Concurrency:*
Controlled interaction on shared resources
- *Persistence:*
File systems + I/O devices