
OPERATING SYSTEM

SESSION I



WHAT IS OPERATING SYSTEM

- 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

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

THE OS AND HARDWARE

- An OS mediates programs' access to hardware resources
 - 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
 - processes (CPU, memory)
 - files (disk)
 - sockets (network)

WHY BOTHER WITH AN OS

- Application benefits
 - programming simplicity
 - See high-level abstractions (files) instead of low-level hardware details (device registers)
 - Abstractions are reusable across many programs
 - portability (across machine configurations or architectures)
 - Device independence: 3Com card or Intel card?
- User benefits
 - Safety
 - Program “sees” own virtual machine, thinks it owns computer • OS protects programs from each other. OS fairly multiplexes resources across programs
 - efficiency(cost and speed)
 - Share one computer across many users
 - Concurrent execution of multiple programs

INSIDE OS

- Process and it's management
- Threads and concurrency
- Scheduling
- Memory management
- Inter process communication
- I/O management

TYPES OF OS

- Distributed OS
- Parallel OS
- Client/Server Computing
- Embedded/Mobile Computing



ACTIVITY TIME

