CSCI 2132 – Software Development

Introduction to UNIX

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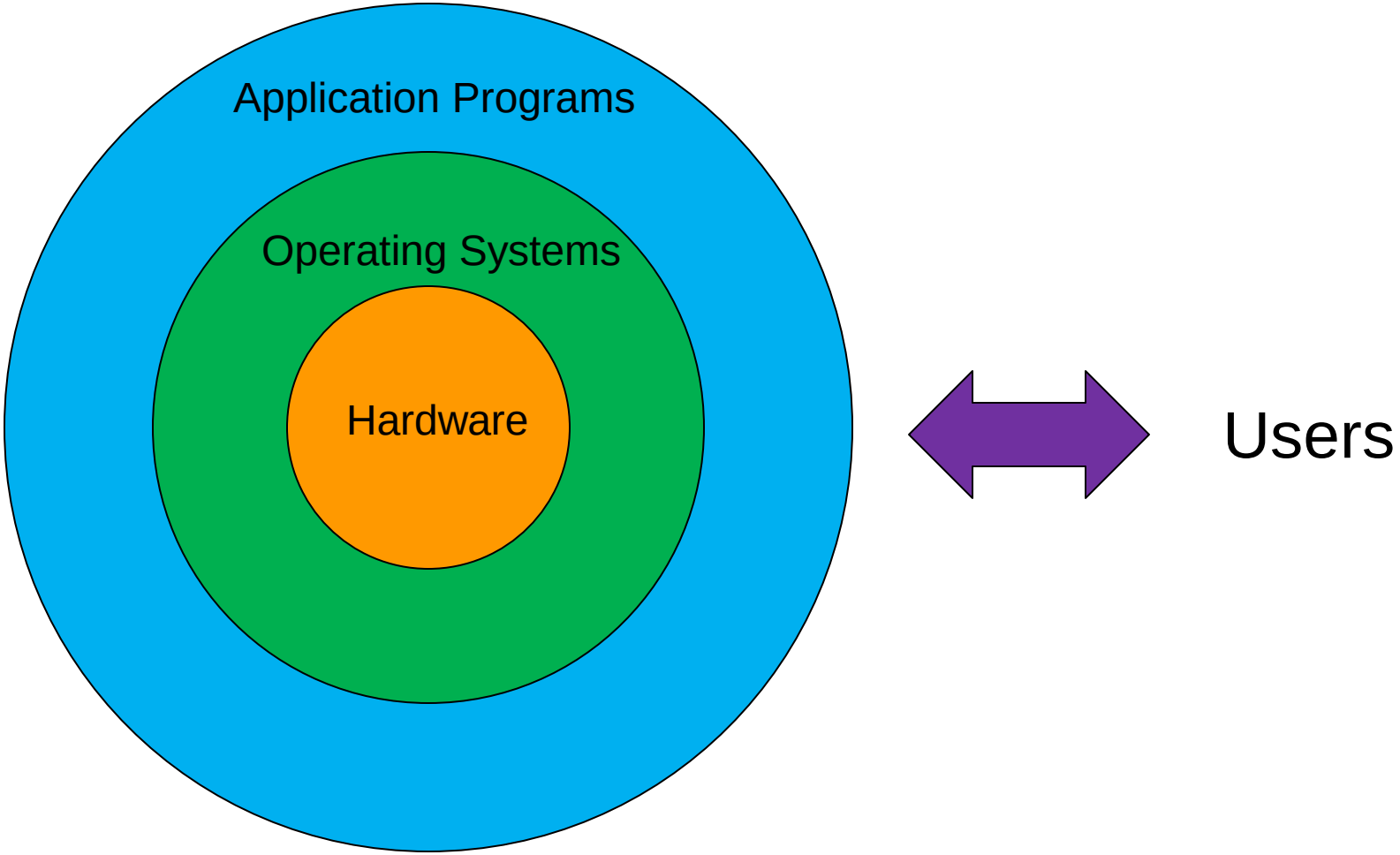
Operating Systems: The Onion Skin Model



Some Functions of an Operating System

- Manages the hardware resources of the computer systems
  - CPU time, disk space, memory access, …
- Provides an interface between application programs and the hardware
  - Hide the complexities of hardware interface from application programs
  - Protects the hardware from user mistakes and programming errors (to prevent crashes)
- Protects user's programs and data from each other (security issue)
- Supports inter-process communications

UNIX History (I)

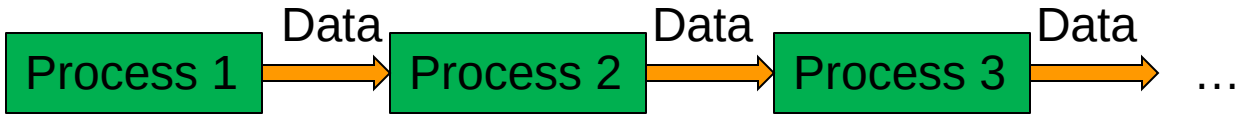
- 1969: 1st version by Ken Thompson at Bell labs
  - The context:
    - Hardware was small and slow
    - Users were programmers
  - MULTICS – (space wars) → UNIX
- Early 70s: Rewritten (mostly) in C by Thompson and Denis Richie
  - Code understandable!
- 1970s: Contributions from researchers at academic institutions, particularly UC Berkeley

UNIX History (II)

- 1980s: the UNIX wars
  - System V (AT&T) vs BSD Unix (UC Berkeley)
- 1985: Free software foundation launched the GNU project (GNU's Not UNIX)
  - A complete UNIX-like system, except for the kernel
- 1991: Linus Torvalds announced the LINUX project
  - Open source, UNIX-like OS kernel
  - Does not share code with UNIX
  - Usable in 1992
  - GNU/Linux

UNIX Philosophy

- UNIX Philosophy for utilities
  - A program should do one thing
    - e.g. ls, who
  - It should do it well
  - Complex tasks should be performed by using these utilities together
- Pipes are used to specify that the output of one process is to be used as the input to another process
  - Pipeline:



  - Example: who | sort

Some Notable Features of UNIX

- It allows many users to access a computer system at the same time
- It is portable