Operating System Fundamentals

Module 01:

Introduction to Operating Systems

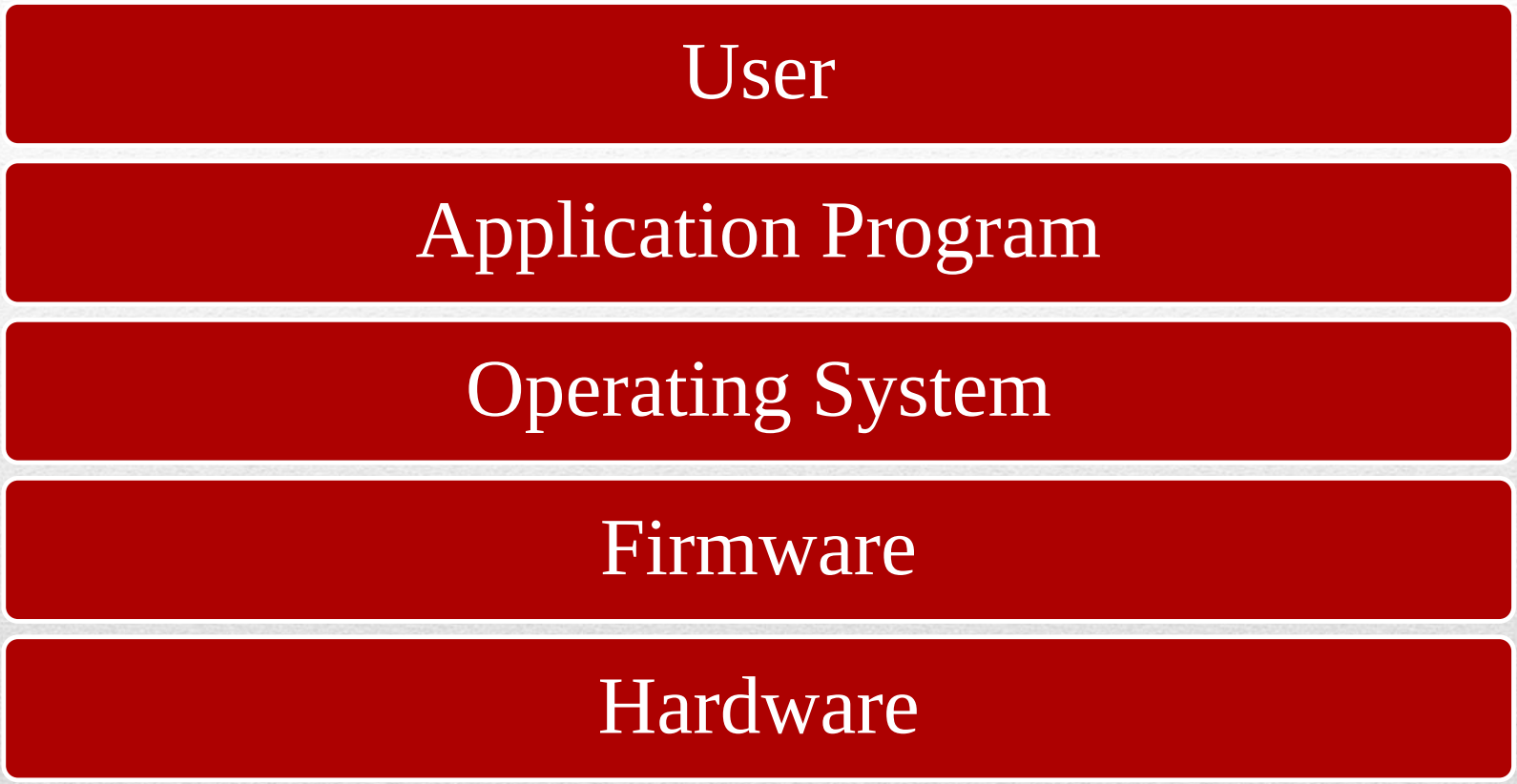
Agenda

- Operating System Definition
- Types of OS's
- Kernel Features
- Other OS Components
- Role of the BIOS

“An operating system is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is a vital component of the system software in a computer system. Application programs require an operating system to function.”

Wikipedia

Operating System



Computer System

Types of Operating Systems

- Embedded
- Single-tasking
- Multi-tasking
  - Pre-emptive or cooperative
- Single-User
- Multi-User
- Distributed
- Real-Time

Role of the Kernel

- Kernel is the fundamental part of the OS providing the following:
  - Process/Task Management
  - Memory Management
  - Disk support
  - Virtual Memory Support
  - File System Support
  - Interrupt Handling
  - Device Driver Support

Other Components

- User Interface
  - Keyboard/Mouse/Touch
  - Screen
  - Sound

Other Components

- Security
  - Users
  - Groups
  - Permissions

Other Components

- Networking
  - Protocols
    - TCP/IP
    - Wireless (802.11x)

Basic Input/Output System

- BIOS
  - Term primarily used in PC-family of computers
  - Firmware
    - In non-volatile memory like ROM, EPROM or Flash
  - Tests CPU, ROM, RAM, other devices on startup
  - Boots off disk device and passes control to OS (Bootstrap)
  - Provides fundamental I/O capabilities
  - Extensible Firmware is replacing the BIOS slowly

Common Operating Systems

- Android
- BSD (Berkeley Software Distribution)
- iOS
- Linux
- Mac OS X
- Microsoft Windows
- Microsoft Windows Server
- Microsoft Windows Phone
- IBM x/OS

Software Licensing

- Proprietary
- Open Source
  - Free Software Foundation
  - Open Source Initiative
  - General types: copyleft, permissive

(See Course Site on eConestoga)

Assignment