# CSCE 351
# Operating System Kernels

**History of Operating Systems**
**&**
**Basic Operating System Concepts**

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## What is an Operating System?

- A program
- An interface
- A programming environment
- A resource manager
- A service provider

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## Why do we need operating systems?

- They provide a high-level abstraction of physical resources
- They allow sharing of limited or expensive physical resources

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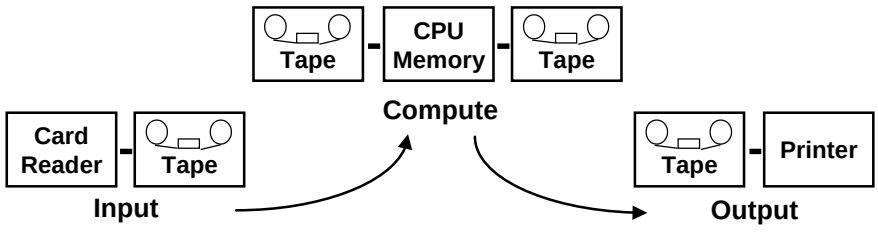
## A brief history of Operating Systems

- Hand programmed machines (‘45-’55)
- Batch processing/Off-line processing (‘55-’65)

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## A brief history of Operating Systems

- On-line processing (‘62-’69)
- Multiprogramming (‘65-’80)
- Timesharing (‘70- )
- Personal computing (‘80- )

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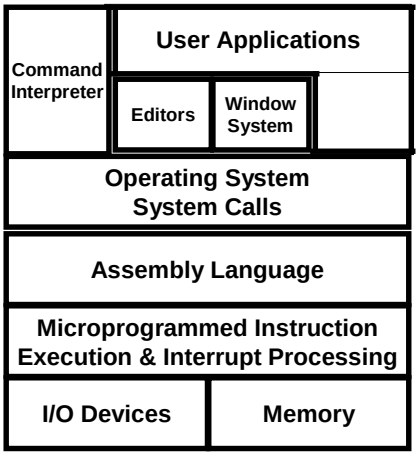
## What is an Operating System Today?

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## Basic Operating System Functions

- Device management
  - » Programmed I/O
  - » DMA
- Secondary storage management
- File systems
- Memory management
- Process management
- Protection & Security
- Network communications

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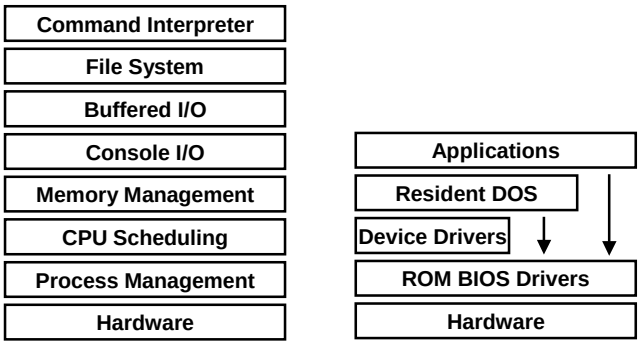
## Operating System Structures

- Layered




- Monolithic

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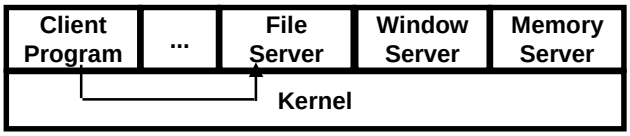
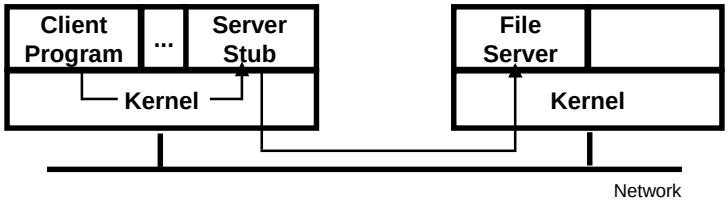
# Operating System Structures

- Client/Server or “Microkernel”
  - » Centralized




  - » Distributed

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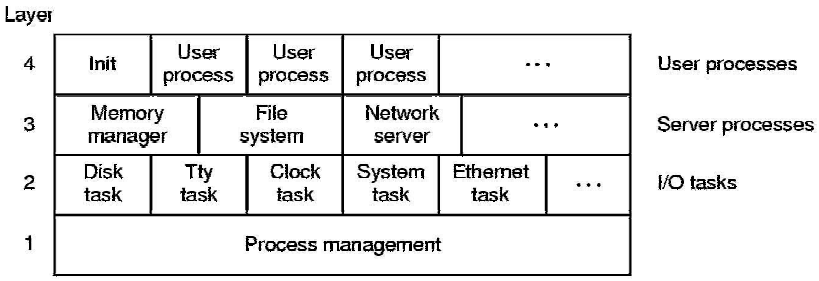
# MINIX Structure




- Is it layered, monolithic, a microkernel or what?

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## Basic Operating System Concepts

- A process
- An address space or context

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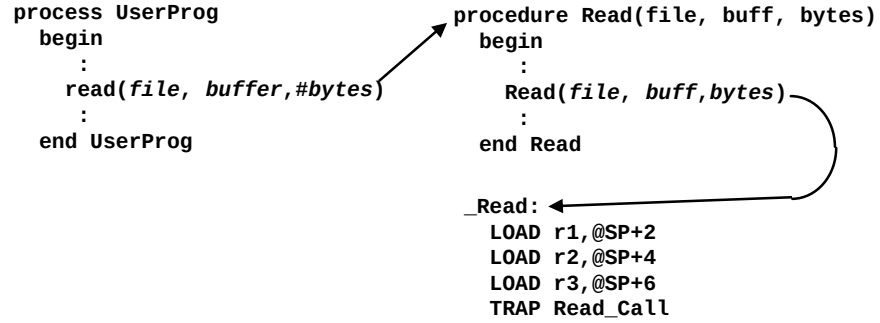
## Basic Operating System Concepts: A system call

**Example: Programmed I/O**

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