

# DESIGN ISSUES

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- Efficiency
- Robustness
- Flexibility
- Portability
- Security
- Compatibility

# Efficiency

- An OS allows the computer system resources to be used efficiently.
  - Most I/O devices slow compared to main memory (and the CPU)
  - Use of multiprogramming allows for some processes to be waiting on I/O while another process executes
  - Often, I/O still cannot keep up with processor speed
    - Optimize I/O efficiency especially Disk & Network I/O

# Efficiency - Issue

- Diversity of I/O devices
- Different access methods (random access versus stream based) as well as vastly different data rates.

# Robustness

- ability of a computer system to cope with errors during execution and cope with erroneous input
- Methods to test robustness
  - Fuzz testing
  - Fault injection
  - Building robust systems that encompass every point of possible failure is difficult because of the vast quantity of possible inputs and input combinations
  - Generalizing test cases
- Distributed system - suffer from various types of hardware failure
  - failure of a link
  - failure of a site
  - loss of a message

# Portability

- ability of an application to run properly in a different platform
  - usability of the same software in different environments.

# Compatibility

- capacity for two systems to work together without having to be altered
  - Eg: if word processor applications are compatible, the user should be able to open their document files in either product
- Compatibility issues come up when users are using the same type of software for a task, such as word processors, that cannot communicate with each other.
  - due to a difference in their versions or because they are made by different companies