

OS Overview: A Few Topics

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Outline

- 1 Types of Operating Systems
- 2 Fundamental OS Concepts

Varieties of Operating Systems

Varieties of operating systems have been developed, e.g.,

- ▶ mainframe operating systems,
- ▶ server operating systems,
- ▶ multiprocessor operating systems,
- ▶ personal computer operating systems,
- ▶ mobile/handheld computing operating systems,
- ▶ embedded operating systems,
- ▶ sensor-node operating systems, and
- ▶ real-time operating systems

which are categorized based on the systems they are designed to run on.

Varieties of Operating Systems

- ▶ Preemptive vs. non-preemptive
- ▶ Interactive vs. batch
- ▶ Multi-user vs. single user
- ▶ etc.

Fundamental OS Concepts

- ▶ Thread.
 - ▶ The execution context including Program Counter, registers, execution flags, and stacks.
- ▶ Address space and address translation.
 - ▶ Program and physical machine's views of memory. Program's view and physical machine's view are different.
- ▶ Process.
 - ▶ A process is an instance of a running program, and includes an address space and one or more threads.
- ▶ Dual mode operation. It is to provide protection, i.e.,
 - ▶ only the system can access certain resources, and
 - ▶ processes are isolated from each other when combined with address translation.