

CSC 139 Chap 1

OS can be viewed as a resource allocator or control program controls i/o devices

Kernel - the OS running all the time on a computer

middleware - software frameworks that provide additional services bundled in with OS

★ OS include the kernel that is always running, middle frameworks & system programs that aid in managing the system while its running.

1.2 Computer-System Organization

bus - provides access between components & memory

Device Controller - responsible for moving data between peripheral devices

Device Driver - each device controller has a driver & provide OS with a uniform interface to device

memory controller - synchronizes access to memory

interrupt - done by sending signal to CPU by using system bus, saying that an event need attention

1. Controller raises an interrupt by sending a signal on request interrupt request line

2. CPU catches interrupt & dispatches it to interrupt handler

3. Handler clears the interrupt by servicing device

interrupt chaining - each element in interrupt vector point to list of interrupt handlers that can service request

bootstrap program - First program to run on computer power on, which loads OS
networking uses bits, storage use bytes

Secondary Storage - Non volatile, such as HDDs

Primary Storage - ram, cache, registers

DMA - Direct memory Access - device controller sends one big chunk of data using directly to main memory with bothering CPU

1.3 core - executes instructions & registers for storing data locally

Multiprocessor - 2 or more processors with a single CPU core

multicore systems - multiple cores on a single chip, less power, faster communication

Processor - chip that contains one or more CPUs

CPU - executes instructions

core - basic computation unit of CPU

multicore - many core on CPU

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Non Uniform memory Access (Numa) - provide group of cpus

local memory, faster to access local mem

blade servers - multiple processor boards, i/o boards, Networking boards placed in same chassis

Clustered Systems - gathers multiple cpus together, composed of multiple Nodes. A node is a multicore system. Share storage & connected by LAN

1.4 OS Operations

trap - or exception software generated interrupt

process - program in execution

Multi programming - run more than 1 program at a time

Multitasking - cpu executes multiple process by switching among them

mode bit - kernel(0) / user(1)

system call - for a user program to ask the operating system to do task that a user program couldn't do

1.5

OS process management - creates & deletes user & system process, schedules process & threads on cpu, suspending & resuming process, providing mechanism for process sync, mechanisms for process communications

OS memory management - keep track of memory & what process are using memory, Allocating & deallocating memory space, moving process & data in and out of memory

OS File management - creating & deleting files, & directories to organize files, Supporting primitives for file and directory manipulation, mapping files onto mass storage, backing up files on nonvolatile media

OS Mass Storage management - Mounting & unmounting, Free space management, Storage allocation, disk scheduling, Partitioning, protection

OS System Management - memory management component that includes buffering, caching & spooling, device driver interface, Drivers for specific hardware devices

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- 1.8 Distributed System - collection of separate computers that work together as a single system.
- 1.9 Bit Map - string of N binary digits that can be used to represent the status of N items ex 0 0 1 0 1 1 1 0 1 0 means available 1 means busy
 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑_a ↑_b
 A A B A B B A B
- 1.10 Accelerometer - allows a mobile device to detect orientation
- Client server System - server satisfies request by client