Stable Storage and File Systems

CS439: Principles of Computer Systems

Bringing It Together

- Virtual address spaces are mapped onto physical address spaces in physical memory
  - Pages are mapped to frames!
  - Lots of policies to consider: demand paging, page replacement, working set, …
- The heap is part of a process's virtual address space (and is thus paged!)
  - Can be explicitly or automatically managed
- I/O devices are important for system usability.
  - Each one consists of the device, the controller, a bus, and a port
  - One of the most important I/O devices is the disk, which provides stable storage.
- File systems make the disk usable
  - Goals include: efficiency, usability, reliability
  - File system metadata is in a superblock
  - A file system manages a disk partition

Vocabulary

platter
polling
head
track
file system
tape drive
comb
cylinder
SSTF
usability
FIFO
DMA
FCFS
transfer unit
SCAN
surface transfer time
persistent storage
external device
transfer time
disk head scheduler
sector
rotational latency
device controller
reliability
logical block address
host transfer time
settle time
elevator
C-SCAN
device port
magnetic disk
free list
rotation time
disk partition
seek time
file
device driver
data-in
spindle
superblock
disk
directory
control
LOOK
efficiency
arm assembly
bitmap
interrupts
data-out
C-LOOK
arm
block
dedicated
spinning disk
bus
surface
status
shared
stable storage