

# CSGE602055 Operating Systems CSF2600505 Sistem Operasi

## Minggu 09: File System & Persistent Storage

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<http://rms46.vlsm.org/2/207.html>

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# Agenda

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- 4 File Systems
- 5 Mass Storage Systems
- 6 FUSE
- 7 RAID
- 8 The End

# Week 09: File System & Persistent Storage

- Reference: (OSCE2e ch9/10/11) (UCB 17A/18/19) (UDA P4L2 P4L2) (OLD 07 09) (SUP WEEK09)
- File System Interface
- File Attribute
- File Operation
- Disk Structure and Organization
- File System Types
- Directory
- FS Mounting vs. Volume Based System
- FS Structure and Implementation
- File Control Block
- FS In Memory Structure
- VFS
- Directory Implementation

- File System Layers
  - Application Programs
  - Logical File Systems
  - File-Organization Module
  - Basic File Systems
  - I/O Control
  - Hardware Device
- Allocation Method
  - Contiguous
  - Linked
  - Indexed
  - Combined Scheme
- Cache
- STREAMS

- Mass Storage Structure
  - Solid State Disk
  - Storage Array
  - SAN
  - NAS
  - Scheduling: FCFS, SSTF, SCAN, C-SCAN, C-LOOK.
  - Disk Management
- Linux I/O Scheduling Algorithm.
  - Deadline Scheduler
  - Completely Fair Queueing (CFQ)

- the `/dev/` directory
  - `/etc/fstab`: configuration of filesystems
  - `/etc/mtab` → `/proc/mounts`: mounted filesystems
  - `/proc/swaps`: swap filesystems
  - `df`: checking disk space and filesystems
  - Device Major and Minor Numbers
  - UUID - Universally Unique Identifier (128 bits)
  - GUID - Globally Unique Identifiers: `ls -al /dev/disk/by-uuid`
  - practically is NOT guaranteed unique
  - FUSE: Filesystem in Userspace

- RAID 0, 1, 5, 6, 10, 100
- Note (<http://www.commodore.ca/windows/raid5/raid5.htm>):
  - RAID was created to enhance data performance, reliability and availability.
  - Striping, parity checking and mirroring are three primary functions of RAID systems.
  - RAID performs its functions transparent to the operating system.
  - Systems are typically defined by ranks consisting of five disks each connected to one or two Disk Array Controllers.
  - Different RAID levels provide varying degrees of speed and data protection.
- Lab
  - Visit <http://os.vlsm.org/>

# The End

- This is the end of the presentation.