CSGE602055 Operating Systems
CSF2600505 Sistem Operasi
Minggu 09: File System & Persistent Storage

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

REV78 28-Sep-2017

Jadwal OS172

Minggu 00	29 Aug - 05 Sep 2017	Intro & Review
Minggu 01	07 Sep - 12 Sep 2017	IPR, SED, AWK, REGEX, & Scripting
Minggu 02	14 Sep - 19 Sep 2017	Protection, Security, Privacy, & C-language
Minggu 03	26 Sep - 30 Sep 2017	BIOS, Loader, Systemd, & I/O
Minggu 04	03 Okt - 07 Okt 2017	Addressing, Shared Lib, Pointer & I/O Programming
Minggu 05	10 Okt - 14 Okt 2017	Virtual Memory
Ming. UTS	15 Okt - 24 Okt 2017	
Minggu 06	26 Okt - 31 Okt 2017	Concurency: Processes & Threads
Minggu 07	02 Nov - 07 Nov 2017	Synchronization
Minggu 08	09 Nov - 14 Nov 2017	Scheduling & Network Sockets Programming
Minggu 09	16 Nov - 21 Nov 2017	File System & Persistent Storage
Minggu 10	23 Nov - 28 Nov 2017	Special Topic: Blockchain
Cadangan	30 Nov - 09 Des 2017	
Ming. UAS	10 Des - 23 Des 2017	

Agenda

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 Stucture and Organization
- File Systen Types
- Directory
- FS Mounting vs. Volume Based System
- FS Structure and Implementation
- File Control Block
- FS In Memory Structure
- VFS
- Directory Implementation

File Systems

- 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 Systems

- 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)

FUSE

- the `/dev/` directory
  - `/etc/fstab`: configuration of filesystems
  - `/etc/mtab` $\rightarrow$ `/proc/mounts`: mounted filesystems
  - `/proc/swaps`: swap filesystems
  - `df`: checking diskspace 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

- 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.