LAST DAY

- security
- file systems
- block devices / IO / DMA
- virtual memory
- synchronization

application namespace API

open
close
read
write
create/delete
mkdir/rmdir

Virtual File System

OS

hardware

layout

```
USER / bin / cat

/ USR /

/home / pid / myfile.txt
```

freespace management: through
- extent list/tree
- linked list
file structure

File allocation table:
- File
- Linked list of pointers
- Inefficient for accessing blocks in the middle of file

inode approach:
- Optimized tree
- Pointers for efficient access to small files

file system failure model:
- System crash during write
- Journaling: use writeahead logging for metadata transactions