

EEE3052 Introduction to Operating Systems  
prof. Jinkyu Jeong

# Project 4. File system

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2017.12.4 (Mon.)

TAs

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# Project plan

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## ■ Total 4 projects

### 1) Process management

- System call
- Scheduling

### 2) Virtual memory

- Stack growth
- COW(Copy-on-write)

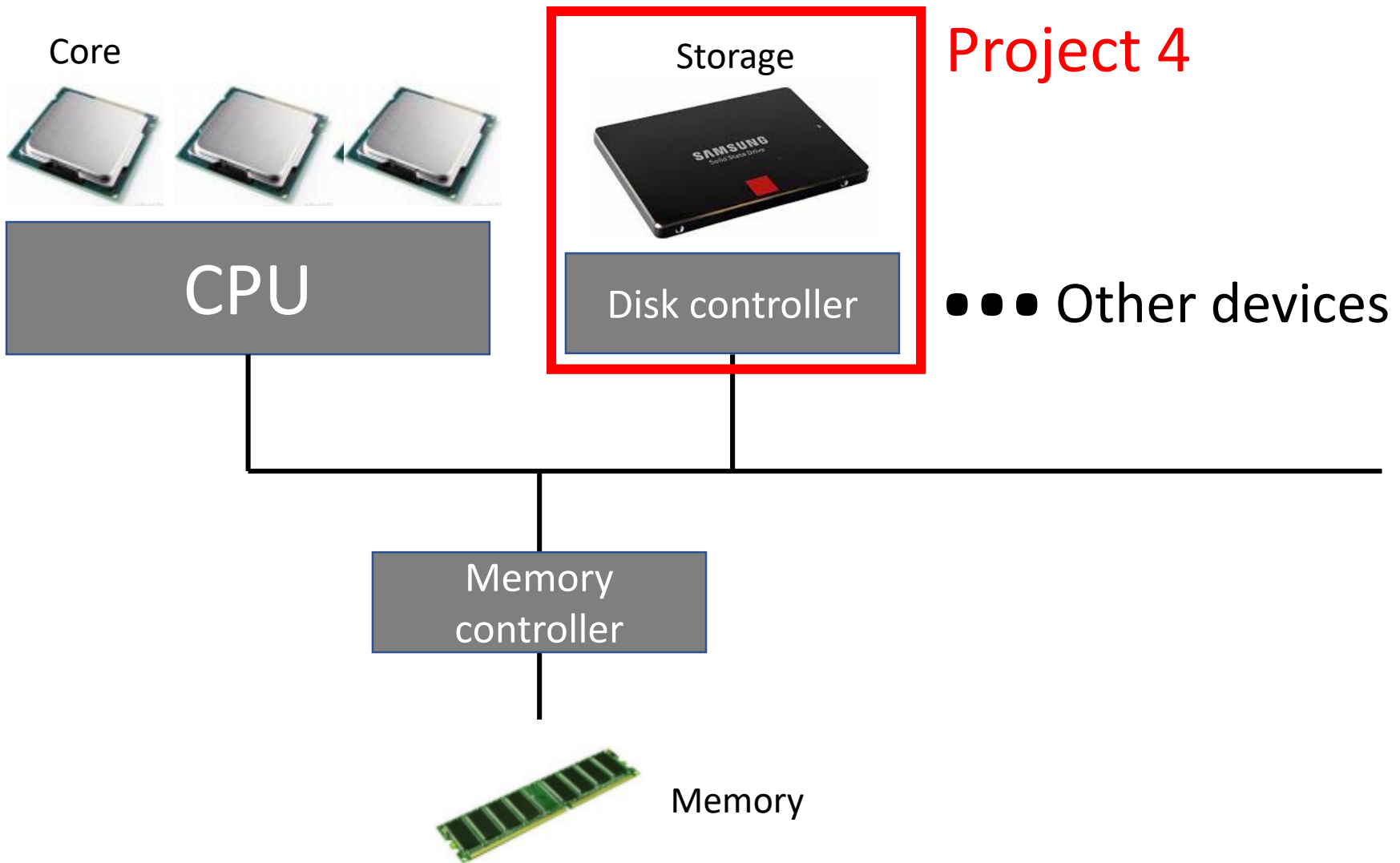
### 3) Synchronization

- Thread implementation
- Mutex & Condition variables

### 4) File system

- Multi-level indirection (Due: 12/4 ~ TBD)

# Computer system organization



# Introduction

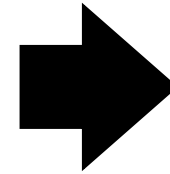
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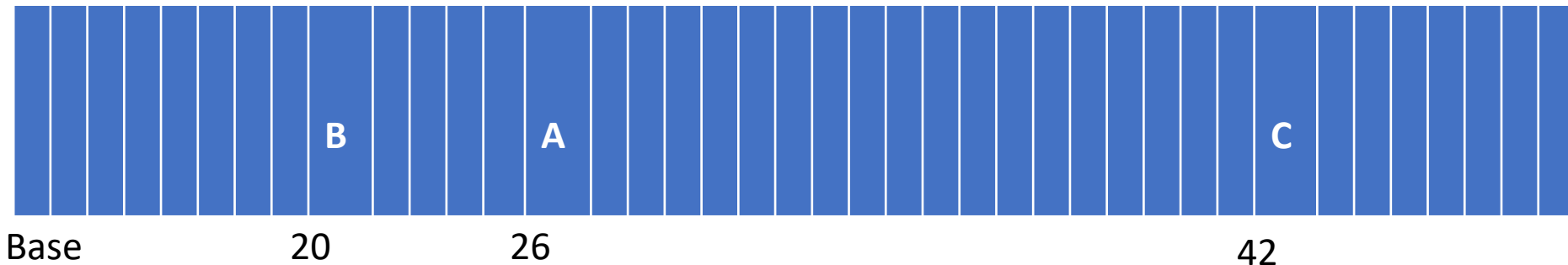
I want to save  
"A, B, C, ..."  
A is saved in 20,  
B is saved in 26,  
C is saved in 42....

User have to manage entire saved data. Not Kernel!  
Therefore, user need to have "user's" mapping table.

Group some data together will be efficient!(e.g. read)



**FILE!!**



# Introduction (cont.)

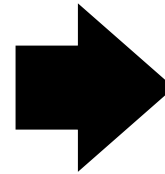
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I want to save file  
"A, B, C, ..."  
File A is saved in 20,  
File B is saved in 26,  
File C is saved in 42

Even concept of file is applied, "user" have to manage mapping tables of saved files.

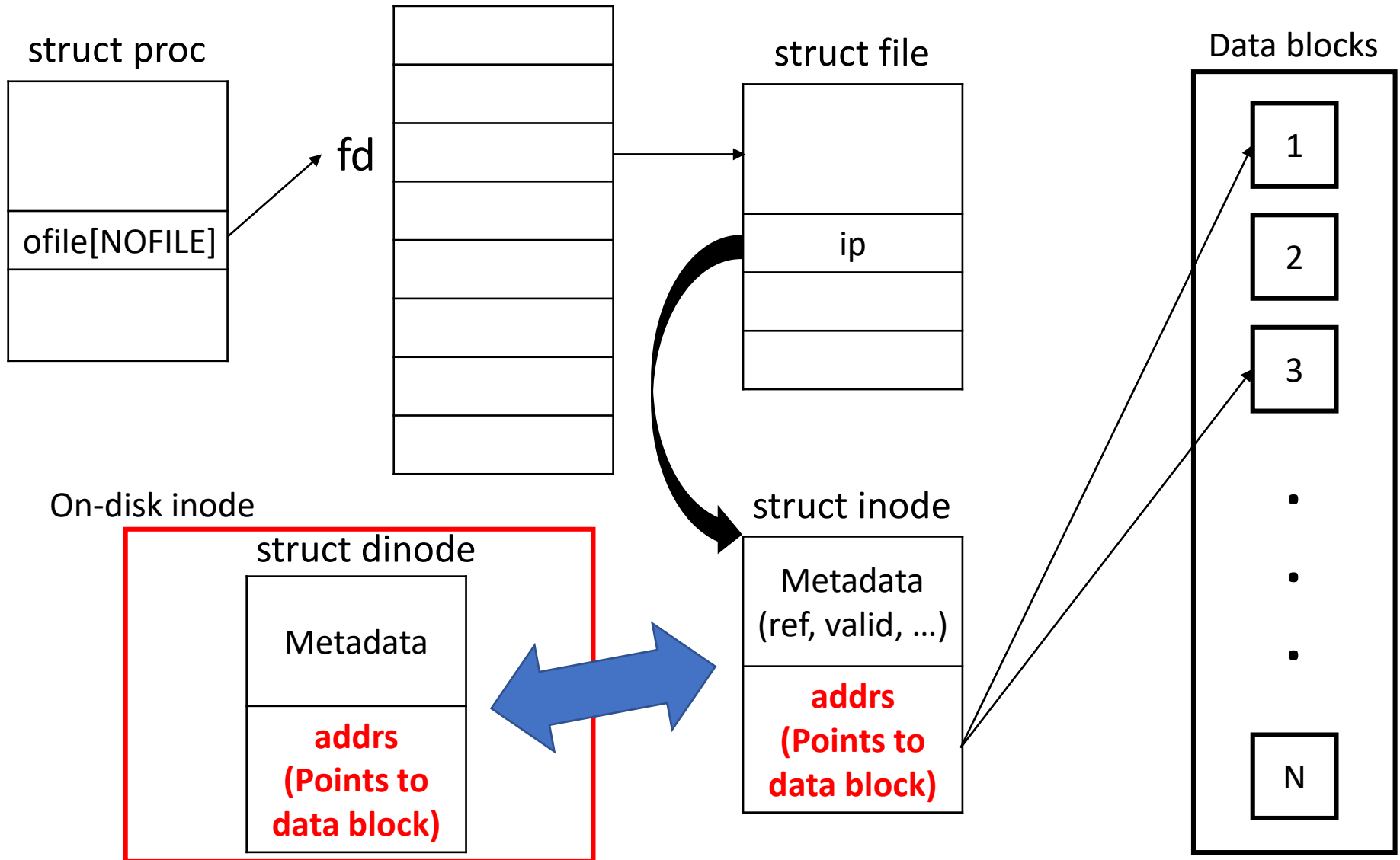
# of files increased, it is better to manage files in kernel.



**FILE  
SYSTEM**



# Big picture: xv6 filesystem



# xv6 filesystem: superblock

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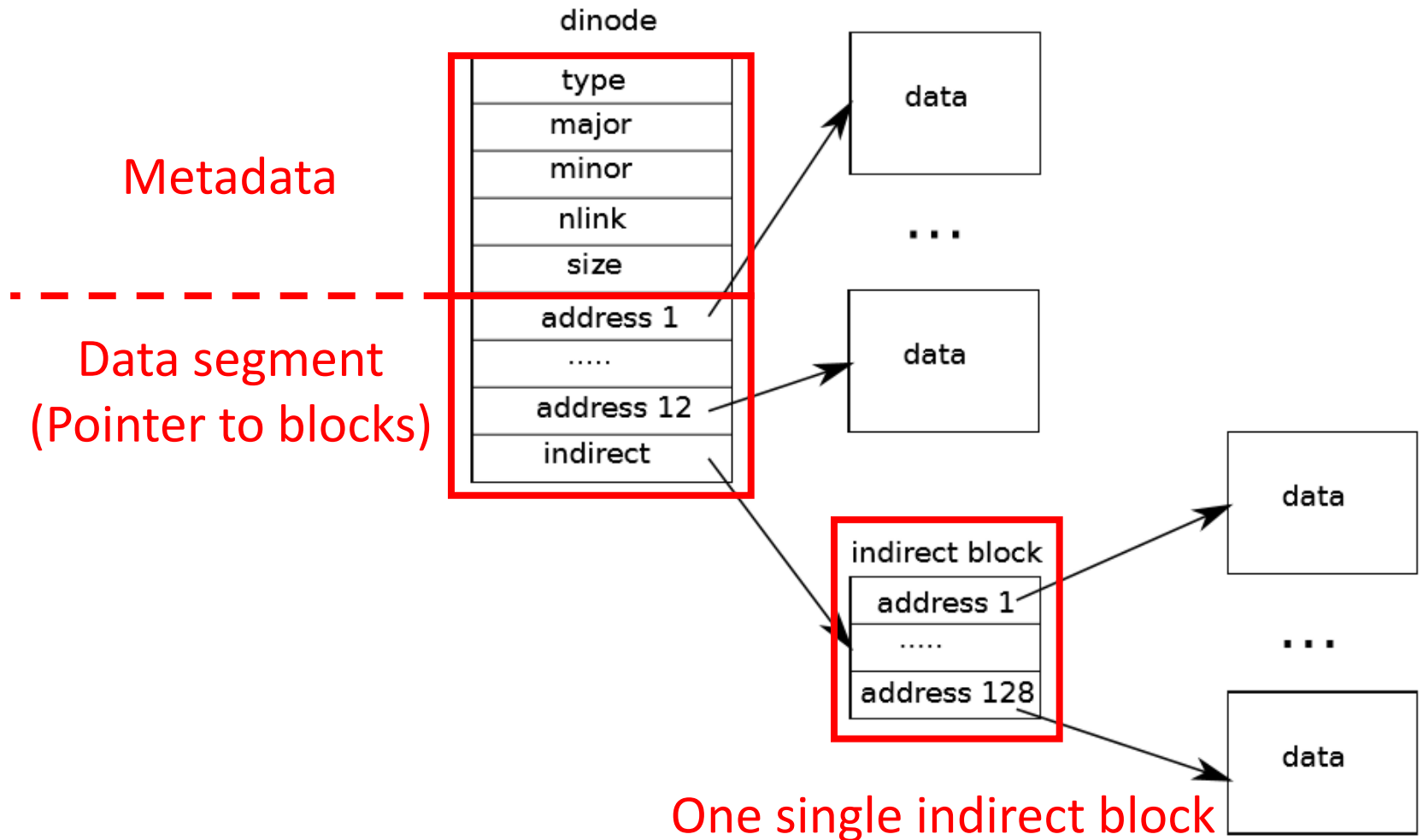
Disk Layout of xv6 filesystem



```
struct superblock {
    uint size;           // Size of file system image (blocks)
    uint nblocks;       // Number of data blocks
    uint ninodes;       // Number of inodes.
    uint nlog;          // Number of log blocks
    uint logstart;      // Block number of first log block
    uint inodestart;    // Block number of first inode block
    uint bmapstart;     // Block number of first free map block
};
```

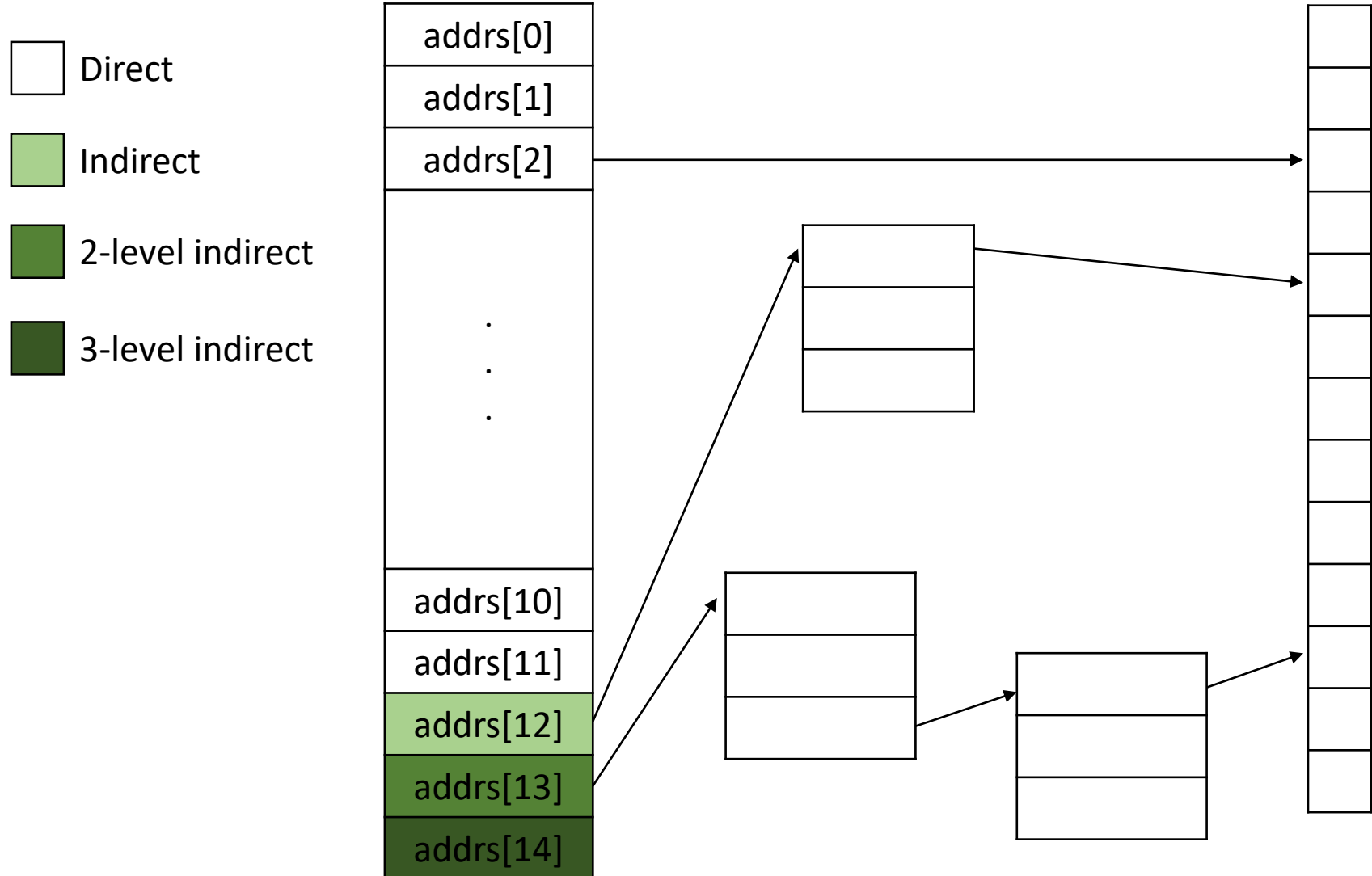
These values are decided at  
“mkfs”

# xv6 filesystem: indirection





# Project 4. Multi-level indirection



# Submission

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- Compress your code as YourStudentID-4.tar.gz
- Send your file to “[minwoo.ahn@csi.skku.edu](mailto:minwoo.ahn@csi.skku.edu)”
- **PLEASE DO NOT COPY**
  - **YOU WILL GET -100 POINTS OF YOUR PROJECT IF YOU COPIED**
- Due date: 12/(Sun.), 23:59:59 PM

# Grade policy

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- **No oral test!**
- You have to submit REPORT(.docx or .hwp) with your code
  - Your report should include all modification you made
  - Not too short, not too long

# Tips

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- Follow the path of file related system calls
  - e.g. open, **read**, **write**, close ...
- Reading xv6-book will help you a lot
  - <http://csl.skku.edu/uploads/EEE3052F17/book-rev10.pdf>
  - Chapter 6. File system (p.71 ~ p.86)

# Questions

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- If you have “**any**” questions, please email to TA
- You can also visit Semiconductor Building #400509
  - **Please email TA before visiting**