Today

Distributed Subsystems (Lesson 7)

✓ * Global memory system

✓ * Distributed Shared Memory

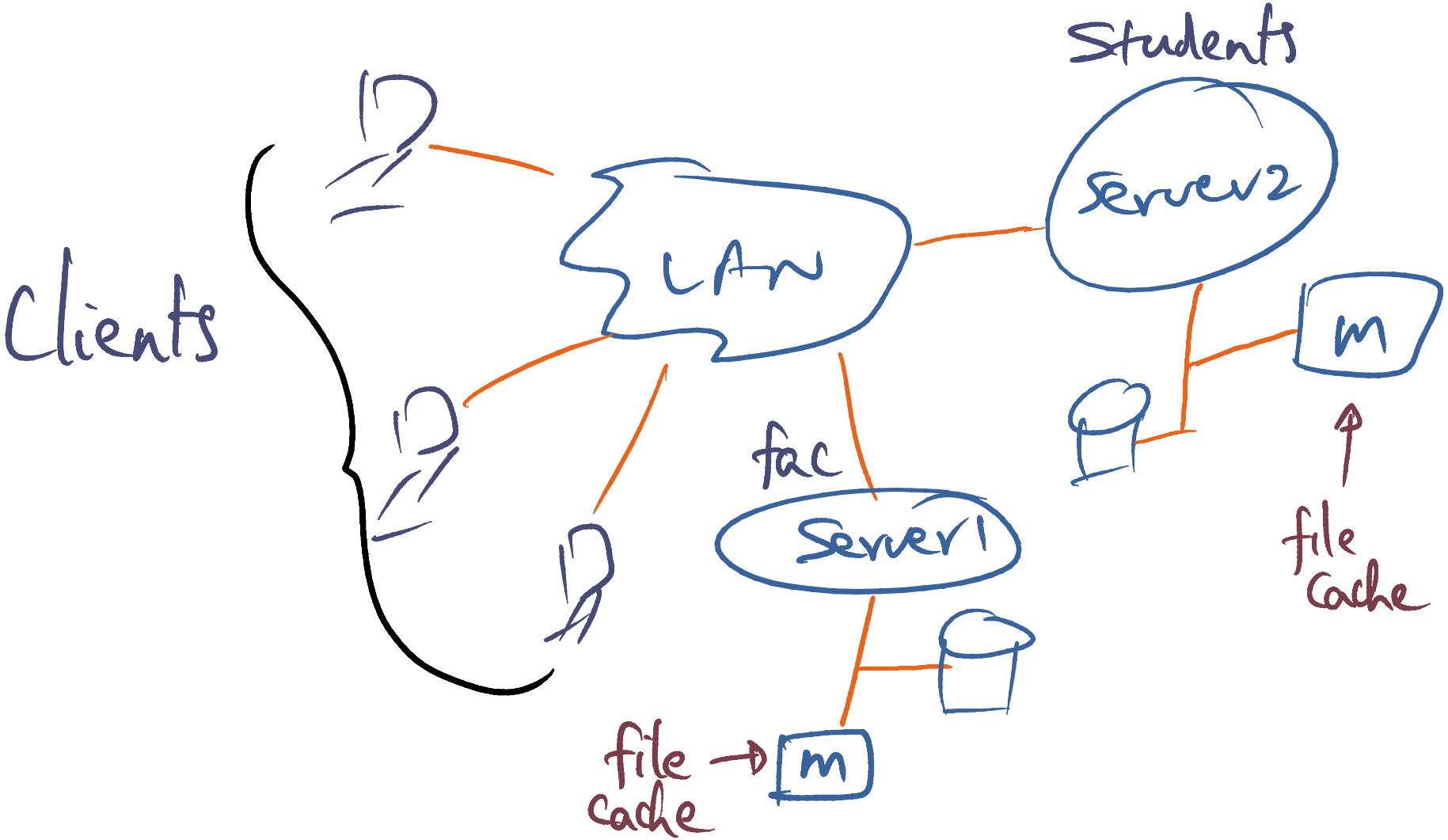
⇒ * Distributed file Systems

Monday

Failures + recovery (Lesson 8)

* please watch LRVM lecture *

NFS

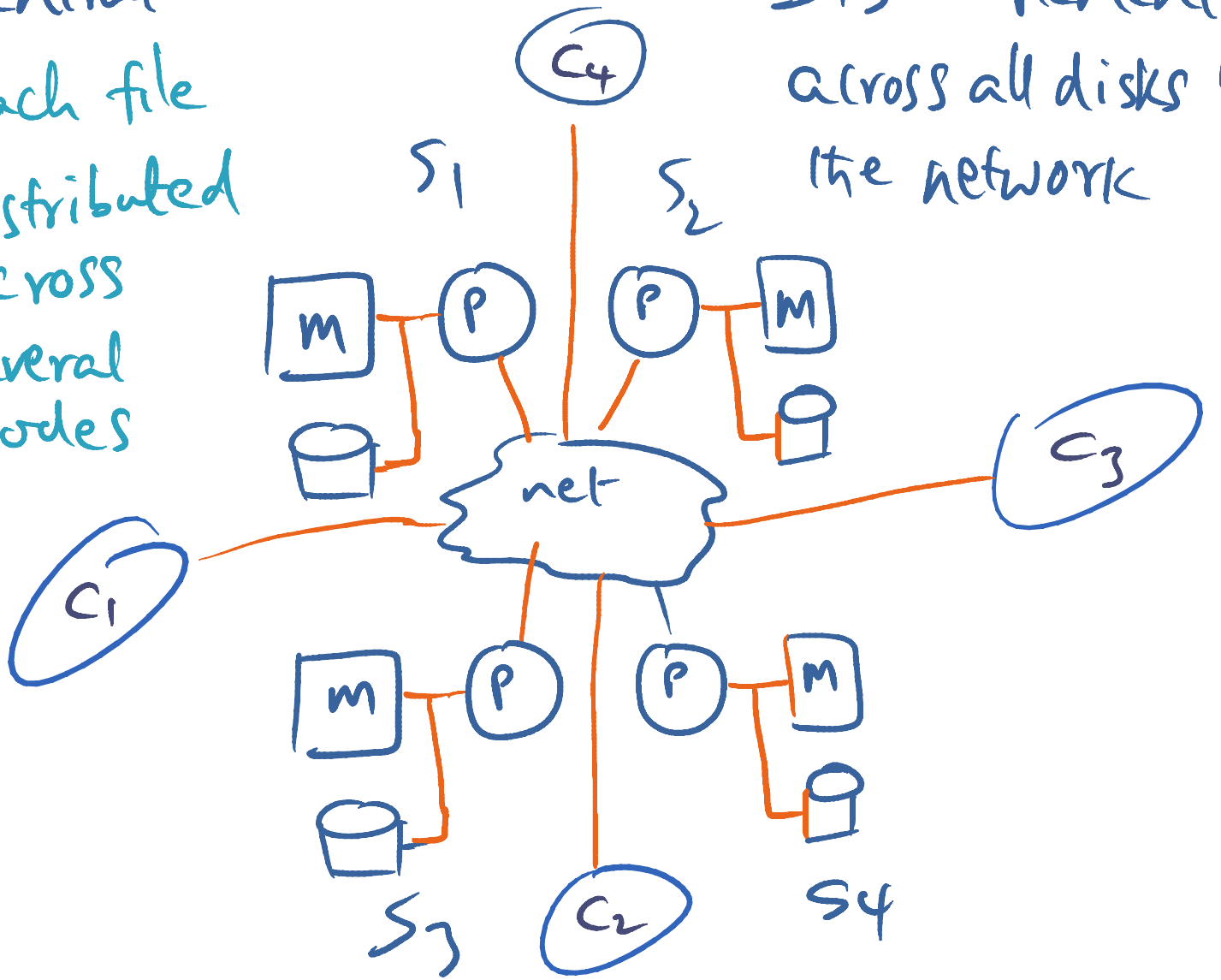

Students
Clients
LAN
Server2
m
fac
Server1
file
cache
file
cache
m

DFS

No central server

- Each file distributed across several nodes

DFS implemented across all disks in the network

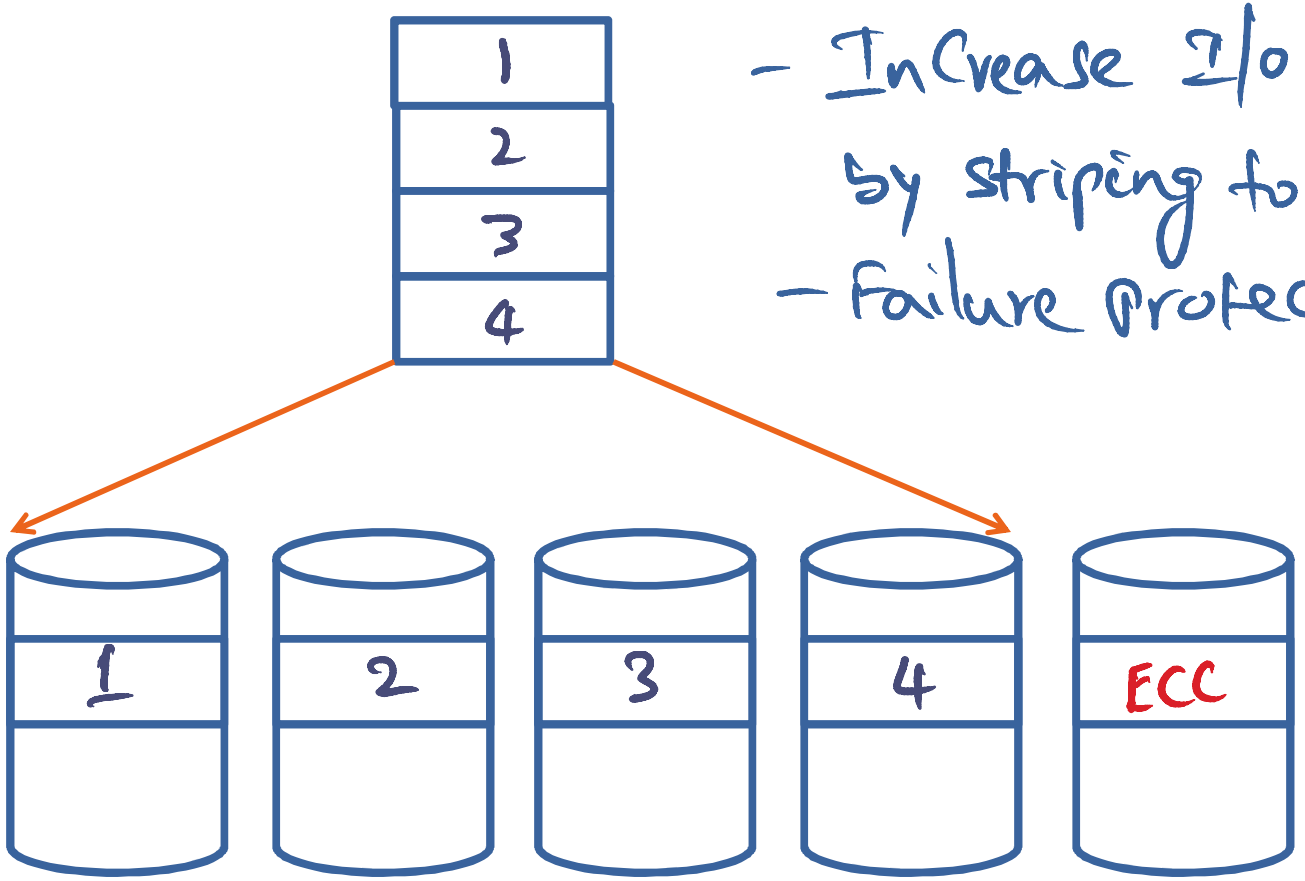


Thought Experiment

→ DFS

- How to use cluster memory for cooperative caching of files?

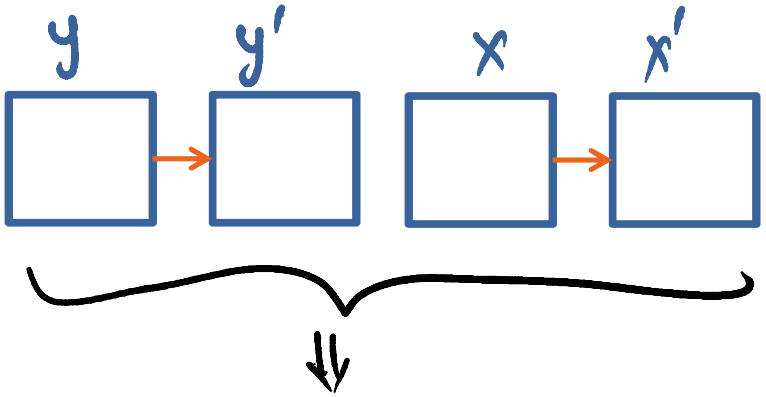
Preliminaries: Striping a file to multiple Disks

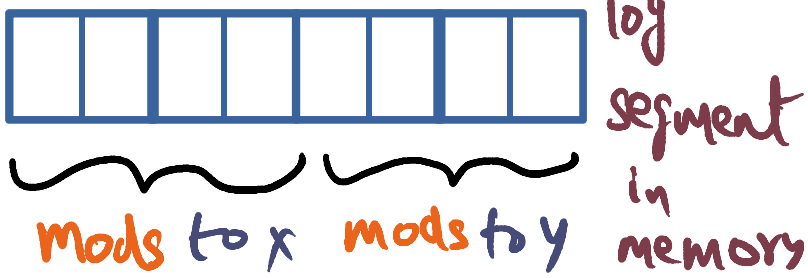


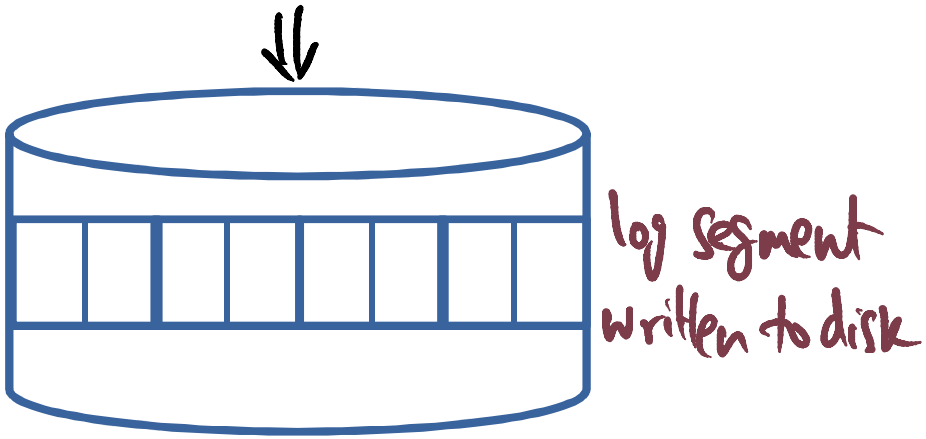
- Increase I/O Bandwidth by striping to parallel disks
- Failure protection by ECC

Drawbacks
- Cost
- Small write Problem

Preliminaries: Log structured File System







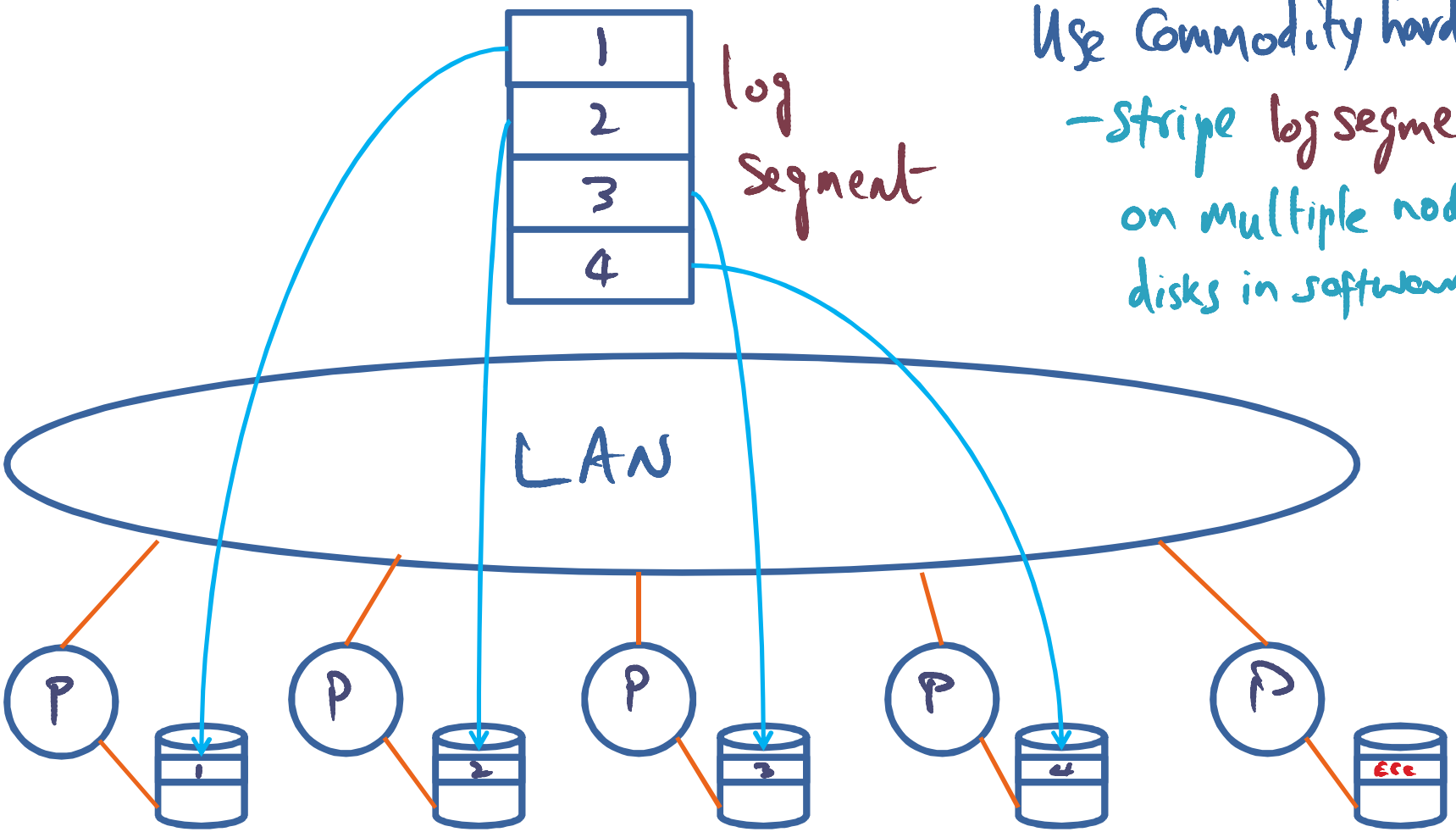
- Buffer changes to multiple files in one contiguous log segment data structure
- Flush log segment to disk once it fills up or periodically

solves small write problem

Preliminaries: Software RAID

Zebra File System (UC-Berkeley)

- Combines LFS + RAID



Use Commodity hardware

- stripe log segment on multiple nodes' disks in software