

Open() → Scope from disk to main memory

close() → Scope to disk

Per-process → access

Open File Locking

→

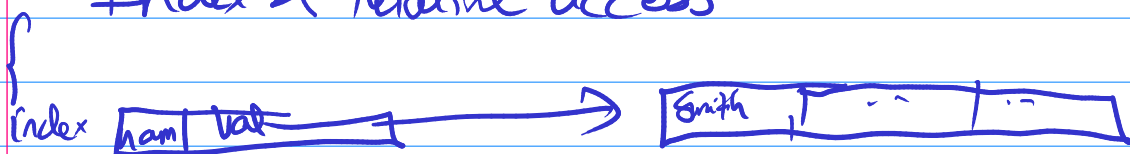
```
import java.io.*;
import java.nio.channels.*;
public class LockingExample {
    public static final boolean EXCLUSIVE = false;
    public static final boolean SHARED = true;
    public static void main(String arsg[]) throws IOException {
        FileLock sharedLock = null;
        FileLock exclusiveLock = null;
        try {
            RandomAccessFile raf = new RandomAccessFile("file.txt", "rw");
            // get the channel for the file
            FileChannel ch = raf.getChannel();
            // this locks the first half of the file - exclusive
            exclusiveLock = ch.lock(0, raf.length()/2, EXCLUSIVE);
            /** Now modify the data . . . */
            // release the lock
            exclusiveLock.release();
        }
    }
}
```

File Access format

Sequential → read/write next
reset

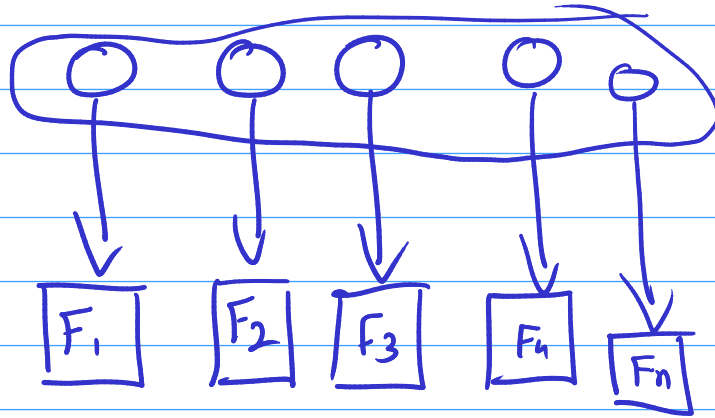
Direct → read n^{th} BYTE
position to n^{th} BYTE

Index & Relative access



Directory

files



Disk Structure

★

Partition: can be RAID protected

RAW

Disk Structure

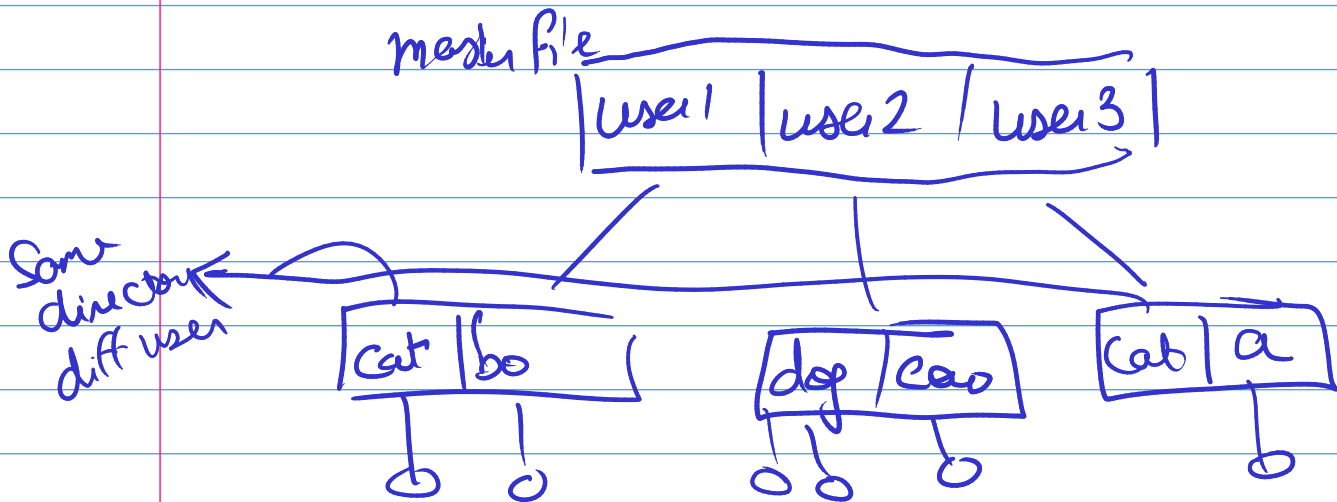
innovate achieve lead

- Disk can be subdivided into partitions
- Disks or partitions can be RAID protected against failure
- Disk or partition can be used raw – without a file system, or formatted with a file system
- Partitions also known as minidisks, slices
- Entity containing file system known as a volume
- Each volume containing file system also tracks that file system's info in device directory or volume table of contents
- As well as general-purpose file systems there are many special-purpose file systems, frequently all within the same operating system or computer

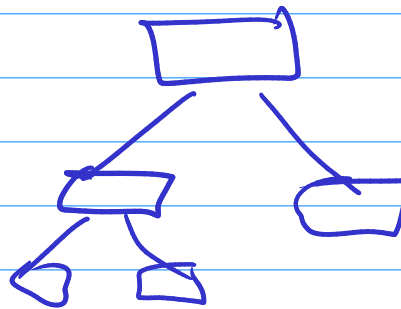
RAID

GFS (SFS)

Single level directory
not working



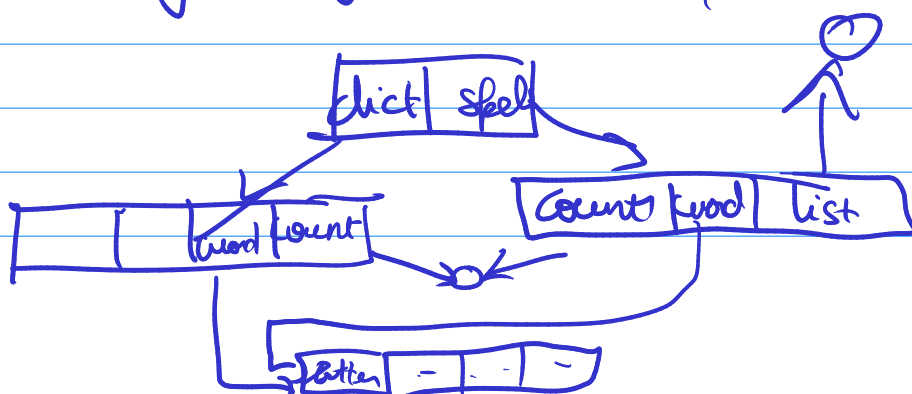
Tree structure



- efficient search
- current/working directory
- grouping is better

Absolute/Relative path

Acyclic graph orientations



→ two diff names → Aliasing

If root dir removed, subdirectories are not removed

⇒ doubling ptr use
↳ back ptr

link →

General graph directories

How guarantee no cycles??

→ Allow links to a file but not subdirectory

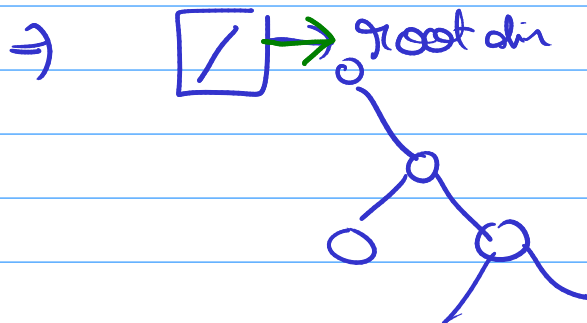
OK

→ Cycle detection algo when adding link

Mounting

↳ OS gets name + location

↓
mount point



⇒ File sharing

File Sharing – Remote File Systems

- Uses networking to allow file system access between systems
 - Manually via programs like FTP
 - Automatically, seamlessly using **distributed file systems**
 - Semi automatically via the **world wide web**
- **Client-server** model allows clients to mount remote file systems from servers
 - Server can serve multiple clients
 - Client and user-on-client identification is insecure or complicated
 - **NFS** is standard UNIX client-server file sharing protocol
 - **CIFS** is standard Windows 2000 protocol
 - Standard operating system file calls are translated into remote calls
- Distributed Information Systems (**distributed naming services**) such as LDAP, DNS, NIS, Active Directory implement unified access to information needed for remote computing

protocols
www

DNS

DNS

Failure

Stateless / preserve state

Consistency semantics

Andrew Filesystem → has session semantics

Unix filesystem (UFS)

Writes to an open file immediately
visible

(May have issues with consistency)

Most likely
100%

ly forms → Mix MCQ, numeric
with the
marking ↓
subjective
2-3 marks

More on CMS

Department courses → Uniform decision
grading
Department moderation meeting
committee

to be early to discuss
Reasonably well grading uniform grading scheme
for all courses