

## I/O Systems

Elevator and Scan algorithms  
Translating user requests into I/O operations  
Character streams  
Record-Based I/O  
Database Interfaces  
Middleware

Remote File Systems  
NFS  
Samba

## Protection Security

1. Breach of confidentiality – Joe finds out Fred's OS grade
2. Breach of integrity – Joe alters his own OS grade from A to D.
3. Breach of availability – Fred erases all OS grades
4. Theft of Service – Fred plays DOOM on the Baylor Mainframe
5. Denial of Service – Joe chokes Earth, Wind, and Fire with junk processes and they go down. Repeatedly.

Masquerading, Man-in-the-middle, session hijacking.

Replay attack.

1. Physical (break-ins)
2. Human (Phishing, dumpster diving)
3. OS (taking advantage of security holes)
4. Network (sniffing)

Trojan Horse (login emulator)  
Trap Door (dmr login in UNIX)  
Logic Bomb (Trojan horse +)  
Stack and Buffer overflow  
Viruses  
Spyware and adware

Network threats  
Worms  
Port Scanning  
Denial of Service

Encryption