Dealing with I/O Devices

4-21-2003

O□ening Disc□ssi□n

- Do you have any questions about the quiz?
- What did we talk about last class?
- Have you seen anything interesting in the news?

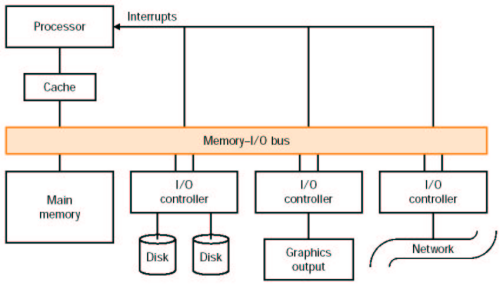
□ in□te □ssa□ □□□ □ ents

- What can we do about the growing ga□ between □e□ory s□eed and □rocessor s□eed?
  - □erious o□ti□ization □eo□le and co□□ilers can □roduce code that recognizes the hardware and uses instruction set e□tensions□
  - □an we □revent stalls ro□ ha□□ening? □o□ □hat is why we try to □ini□ize their i□□act□
  - We already are hitting □e□ory bottlenecks in the consu□er □arket□ □hat's why a □□Hz □achine isn't□twice as □ast as a □□Hz □achine□

□he □□le □□ I/O

- □o □ar we have □ocussed on develo□ing a □rocessor that can □er□or□ the co□□utations we require and ho□e□ully do the□ quickly□
- □□□this □rocessor e□ists in a co□□lete vacuu□ though it is useless□We have to be able to get in□or□ation to and □ro□ it□ □his is the role o□ □□□ and it's □er□or□ance can be □ust as critical as the other □arts we have discussed □or a syste□□

O□gani□ati□n □□ I/O



□e□□□□ ance □□ I/O □□ste□ s

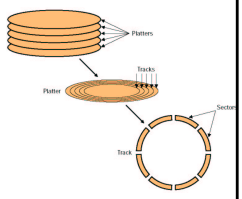
- □hrough□ut □so□eti□es all that really □atters is how long it takes to get a large chunk o□data out through a given device□ □his ignores latency o□starting things u□□
- □□□□when we need □ore □requent s□all bursts o□co□□unication the □ransactions □er second□□etric □atters □ore□ □atency □atters a lot here while bandwidth takes a bit o□a back seat□

□□□es □□ I/O Devices

- □□□ devices can be characterized by their behavior□who they talk to□and their data rate□
  - □ouse □in□ut only□hu□an□low bandwidth□ □□dates counters or send □ulses □or □and y □otion□
  - □agnetic disks □in□ut and out□ut□co□□uter□ high bandwidth□
  - □etworks □in□ut and out□ut□co□□uter□high bandwidth□

□ agnetic Dis□s

- Have several □latters each with its own read□write head□□he □latters s□in between □□□□and □□□□□r□□□
- Disk contains data and error correction codes□ □hese can be intelligently done□



□ etw□□ing

- □he i□□ortance o□inter□o□□uter co□□unications has been growing steadily □or the last several years□
- □ost local networking uses the ethernet □rotocol where the wire is basically a bus between □achines□
- □onger distances use □acket switched □□□□□□□□□he co□□on header □or□at allows heterogeneous networks□

□ in□te □ssa□

- Do you think the □□□urs will win tonight?
- □□oved □ssign□ent □□back to □riday□ □ou can get your grades on the web by e□ecuting the □ollowing co□□and □ro□ □hu□□□users□□lewis□□ocal□H□□□□ Docu□ents□□rades□□rade□heck□at□□se your □hu□login na□e□□our original □assword is your □digit student nu□ber□