

COMP 200: Elements of Computer Science Fall 2004 Lecture 30: November 12, 2004

From Processor to Computer

On the Board

What are all those acronyms?

Test is due Monday, 5PM

Back to Processors

Draw the Processor from last class

- 1. Enclose the picture in a chip-like package
- 2. Add busses (from drawing)
- 3. Notes on Nortshide
 - a. Direct and automatic interface to memory bus (using another form of finite state controller) DDR (double data rate) memory is more power efficient than traditional RAM. Speeds range from 2.1 gigabits per second to 6.4 Gbps.
 - b. Display is just a designated area in memory, with hardware that interprets the numbers as picture elements (pixels). Often have a graphics card or display card it sits between the Northside bus and the VRAM. A high-end graphics card does 20-30 GigaOps.
 - c. In a standard PC design, this bus is sometimes called the Northside bus
 - d. Programmed interface to I/O bus (using load & store operations on specially designated memory locations) hidden by operating system (OS)
- 4. Notes on Southside
 - a. ATA (advanced technology attachment) is most popular standard for disk drive attachment; sometimes called IDE (integrated device electronics). Several levels of ATA standard, ranging in speed.
 - b. Firewire up to 800 megabits (100 megabytes) per second.
 Favored connection for digital cameras, iPods, & external disks. (ATA connectors are wider and more fragile.)

- c. PCI bus (peripheral component interconnect) used to add new "cards" to your PC. (Similar standard for laptops, PCMCIA.) Graphics cards often sit on the PCI bus for power, with connections into the Video Bus. Commands come down the PCI bus, data goes over the faster Video Bus. Used to add Ethernet cards, modems, etc. on this bus. Now, television tuners, ...
- d. USB (universal serial bus) used for modern keyboards, slow cameras, scanners, slower disks, reading lights, ...
- e. Keyboard & Mouse an old standard that most chipsets support
- f. Audio connections for speakers, modems, etc. Used to need separate sound cards (PCI); most chipsets now include audio and moden capabilities with reasonable capabilities.
- g. BIOS connection to boot your machine, a 1980s PC.
- 5. Peripheral devices
 - a. Disk drives up to 500GB on a single platter today. Only use the outer portion of the disk. Speeds of 3000 RPM and more. Fine grained control of disk head (flying disk heads) using processor on disk arm.
 - b. CD drives/DVD drives burn information with a laser (state changes in the surface). Different encoding standards, different emulsions. CD-RW works by reheating the emulsion to put it back into a standard state.
 - c. Flash memory cards (BIOS, digital cameras, mp3 players) a slow, nonvolatile memory.
- 6. Power supply, case, and so on...

