

LIS-3353

Hardware

(first a few admin notes:)

- This week. 2X Lecture then Discussion.

(first a few admin notes:)

Next Week Tues – LINUX INSTALL, in class.

To prepare:

- bring laptop, if possible
- Download AND install “Virtualbox”
- Download AND DO NOT install “Lubuntu ISO” (it's a big download)

(more details in a forthcoming announcement)

(first a few admin notes:)

Jane and John Marks Foundation +
Ladies Learning To Lead =

Afterschool coding program @ Rickards.

INSTRUCTION: Thursdays, 4-5:30 pm

SUPPORT: Fridays, 2-5:30 pm with L3.

(again, more to come in an announcement)

What is a computer?

Must it be “general purpose...?”

or must it merely just have all the parts?

We know about these:

Macs

Dells

What about these?

Nintendo

Xbox

Router

mp3 player

ipad

Oven...



- Here comes a rant....

- Weird, how it makes more sense (cents? Dollars?) to throw in a general purpose computer, then deliberately disable parts of it.

- If you have to manually root, jailbreak, unlock, or letterbomb it to make it do **exactly** what you want (or even worse, if you **can't**) maybe it shouldn't be considered a computer.

Perhaps, an appliance.

- Don't get me started on the idea that a private company (as opposed to public law) can dictate what I do with legally obtained data or software...

...also, environmental impact

Super Basic List

PROCESSOR

STORAGE

Slightly Less Basic

INPUT

PROCESSOR

STORAGE

OUTPUT

(power)

(“glue”)

PROCESSOR (CPU)

Brains of the operation. “Does” the things.

(GPU's are quite similar; just slightly more optimized to make pretty pictures and animations...

and increasingly, other stuff.e.g bitcoin mining, scientific calculations)

Power

Lately, not a lot. At all.

Even old computers - generally less than a lamp.



- ..touch it. :)

STORAGE

- Permanent (REALLY BASIC)
- Semi-Permanent (Firmware/ROM/Bios)
- Changeable

Short-Term (RAM)

- Long-Term (All them “drives”)

PERMANENT

- The “Board.” That's about it.
- Reliance on this layer is increasingly rare, for obvious reasons.

(ROM used to mean this, now it usually means the next thing...)

Semi-Permanent Storage (Firmware)

- Much of what you think of as “permanent” is more likely “firmware”

That is, technically changeable, but you don't do it a whole lot, only when you want to make deep, fundamental changes/updates to how the hardware operates.

- BIOS
- ROMS
- Devices (routers, cameras, dj equipment, etc)

“Changeable” storage

So, you're in the library using books to work on a paper like it's ancient history or something...

RAM



RAM

(when people say “memory”)

- what you're working on now



- (short term memory)

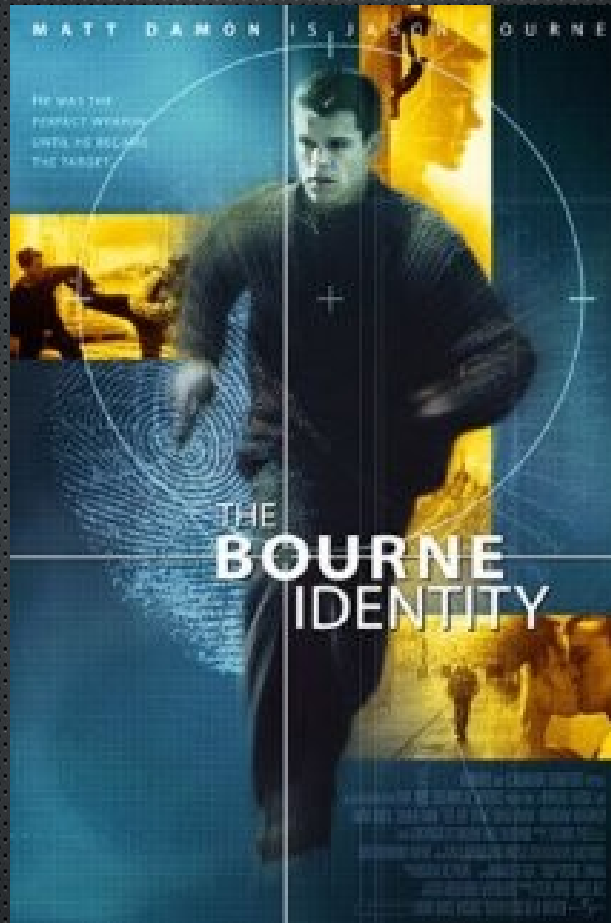
DRIVES (hard, solid-state, CD, etc.)

All (usually local) information that you can get to.



- (long term memory)

Hard drive was accidentally rm -rf-ed, he's trying to recover it. His RAM is fine.



All data was preserved, but his hard drive is now read only. Also, has minimal RAM.



“Drives”

(floppies?)

HD's – IDE v. SATA

CD-ROM, DVD-ROM (blu-ray ROM?)

USB

SD/CompactFlash, etc.

SSD's (the future! Possibly identical to RAM, soon)

INPUT - OUTPUT

Human Input

Human Output

Digital Input

Digital Output

(Increasing trend towards “digital until the very last possible second... consider why?”)

Human Input (analog)

Keyboard

- Touchscreen
- Webcam
- Microphone
- Motion-Sensor
- Mouses/Buttons/Sticks
- Thermometers?

(and other “Internet of things” stuff”

Human Output (analog)

- Screen*
- Speakers*/Headphones*
- Paper
- “Internet of things” stuff here too?
Oculus Rift, Drones, lights/temp in your house, etc.

*but what are the “wires” lately? More to come

Digital Input/Output

- General purpose:

Old-school – *Serial and Parallel*

New hotness: *Universal Serial Bus! (USB)*

Input, output, charging, various sizes

(oh, and also whatever Apple's things are that should probably just be USB, but they're jerks - Europe's cell phone chargers are, by law, ALL Micro USB....discuss)

Digital Input/Output

Internet Data Oriented:

Phone line

Ethernet (wire)

Wireless (802.11 and bluetooth)

Digital/Analog Stuff

Generally, the wires going to the outputs are moving from analog to digital.

Advantage: Signal Quality.

(Monster Cables are definitely a ripoff here)

Disadvantage: Sometimes, reduced interoperability, opportunity for DRM. (though, this is rare)

Audio

Analog: “RCA” – usually the “1/8” in jack, sometimes 1/4
(arguably the best standard ever created....?)

Digital: Bluetooth, USB, occasionally Ethernet and others

Video

ANALOG

TV Video: Cable cord, but lately the RCA A/V (Red / White / Yellow)

(also, occasionally “composite,” RGB)

Computer Video: VGA

DIGITAL:

DVI

HDMI

“glue”

Motherboards. Where it all comes together.

