Computer Hardware

Internal

Power supply	PCI
Motherboard	AGP
video card	PCI-X
ethernet card	PCI-E
sound card	CPU
ISA	GPU

Part 2: Inside the Machine

Why do you care?

The internal components

influence

the capabilities of the machine

AND

its expandability.

Is this good for running fsl?

How many images will it hold?

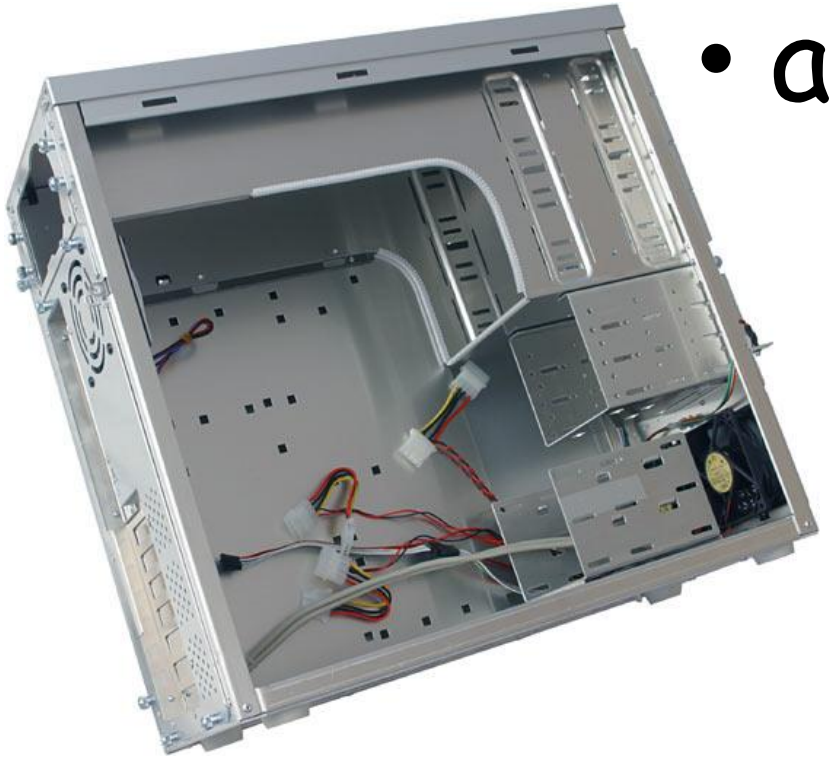
Can I add more memory?

Is it fast and reliable?

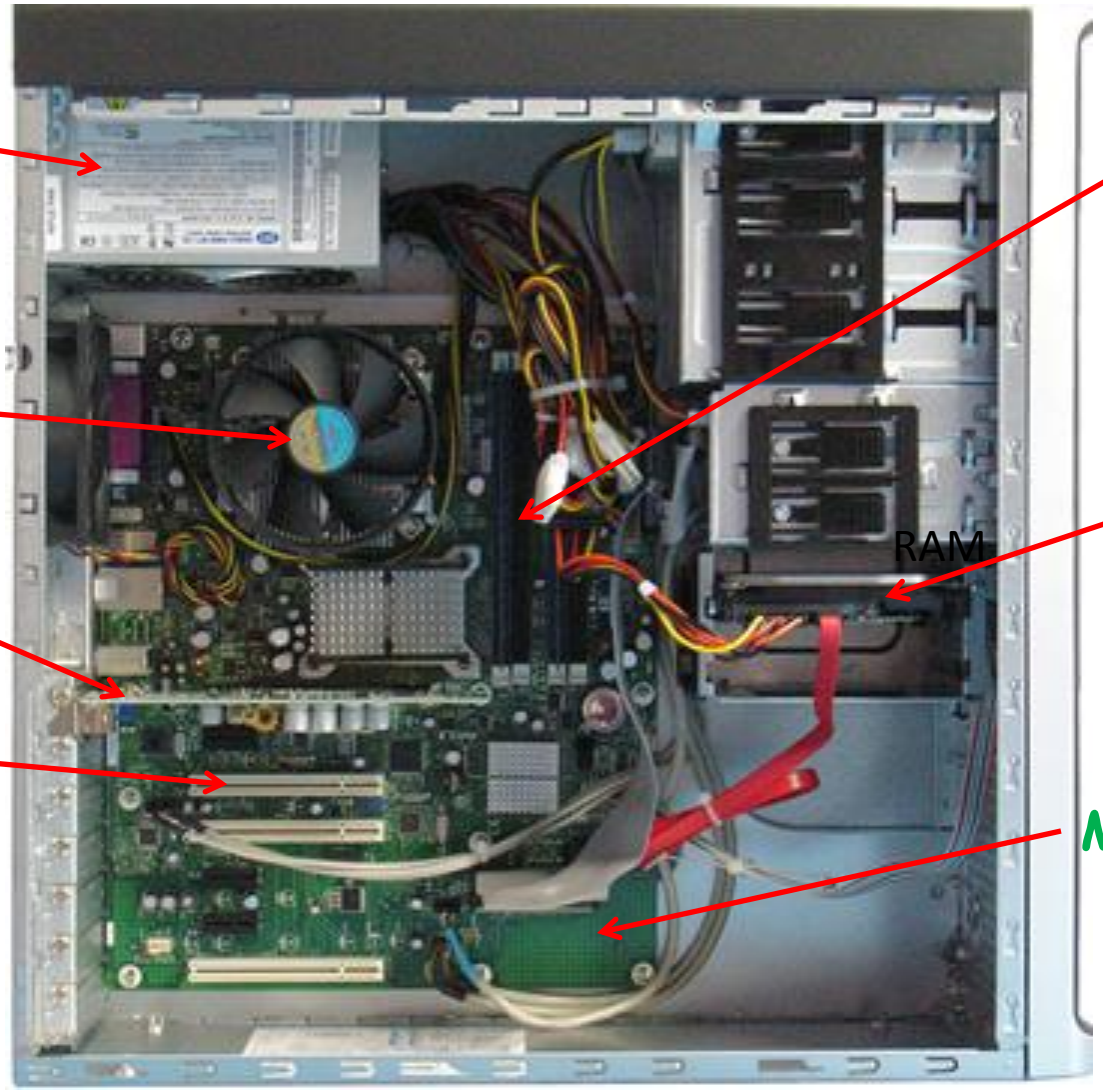
Welcome to the Machine

The Case influences

- motherboard type
- # of components
- Cooling
- and Noisiness



Case with Components



Power Supply

Too small (too few watts) is a problem, too big is not.

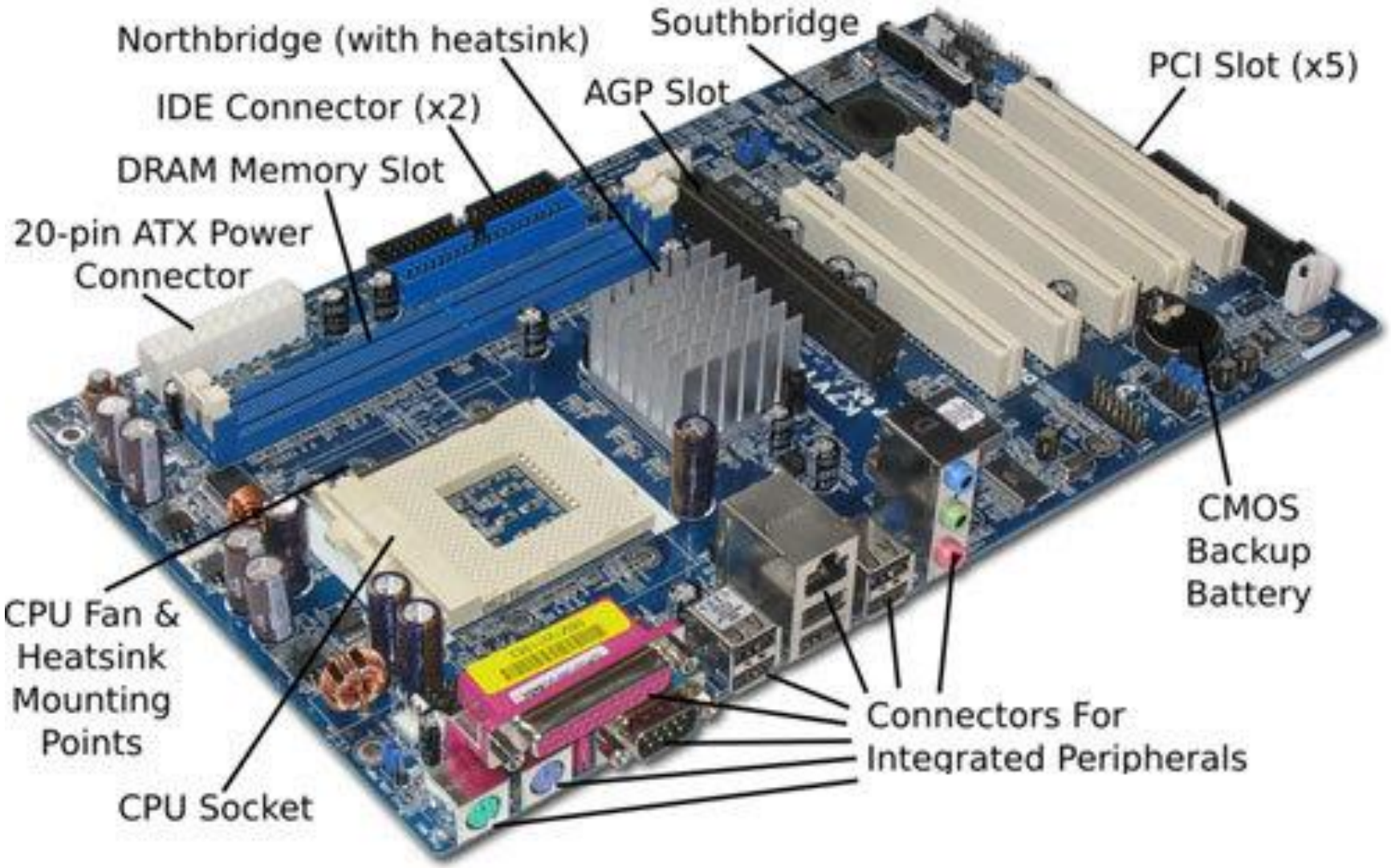
Warning: Video cards are power pigs.

You also want to make sure that your hard drive is big enough for your data (twice as big is good)

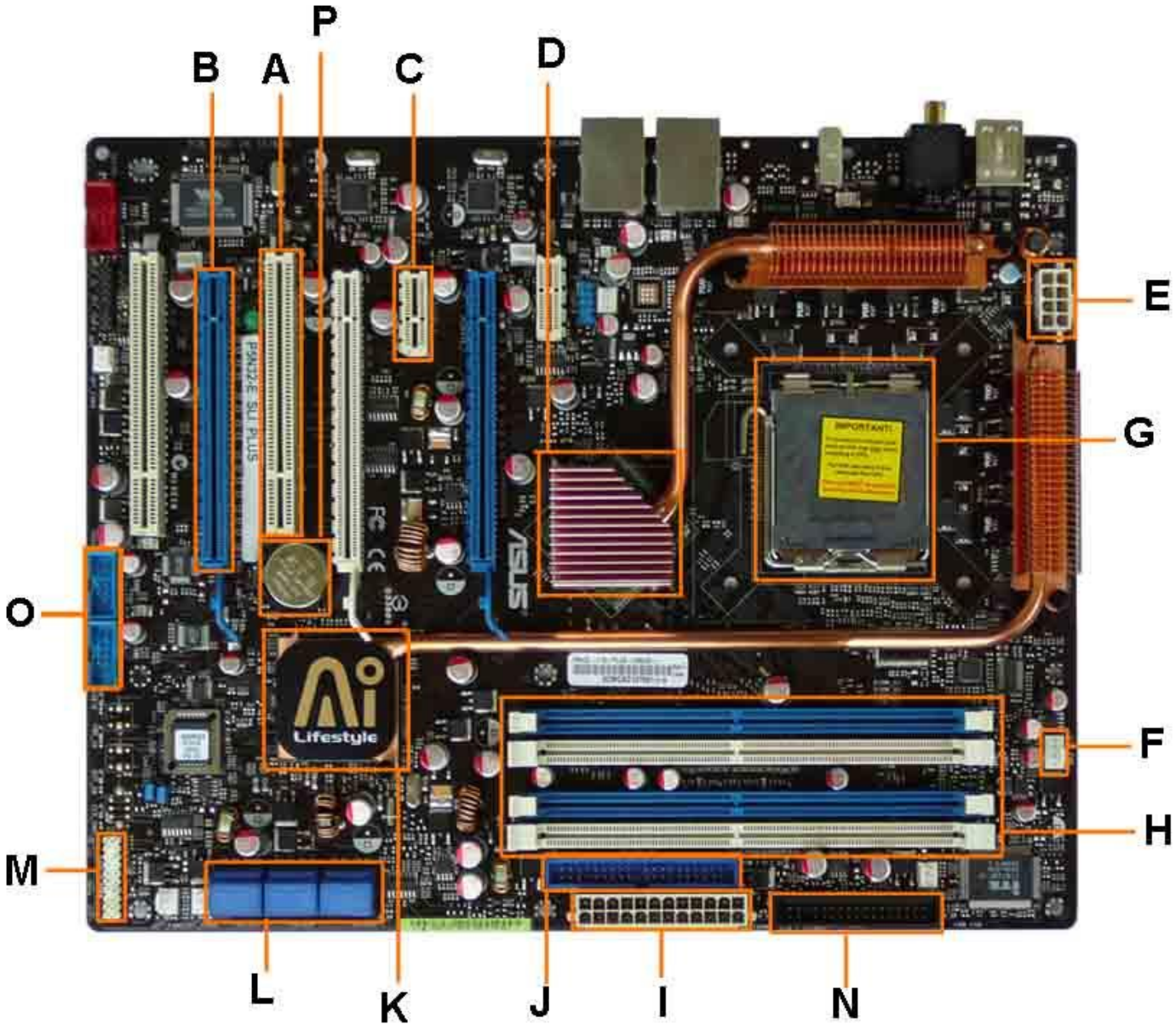
Storage: Hard Drives (HDs)

The Motherboard (Main Board)

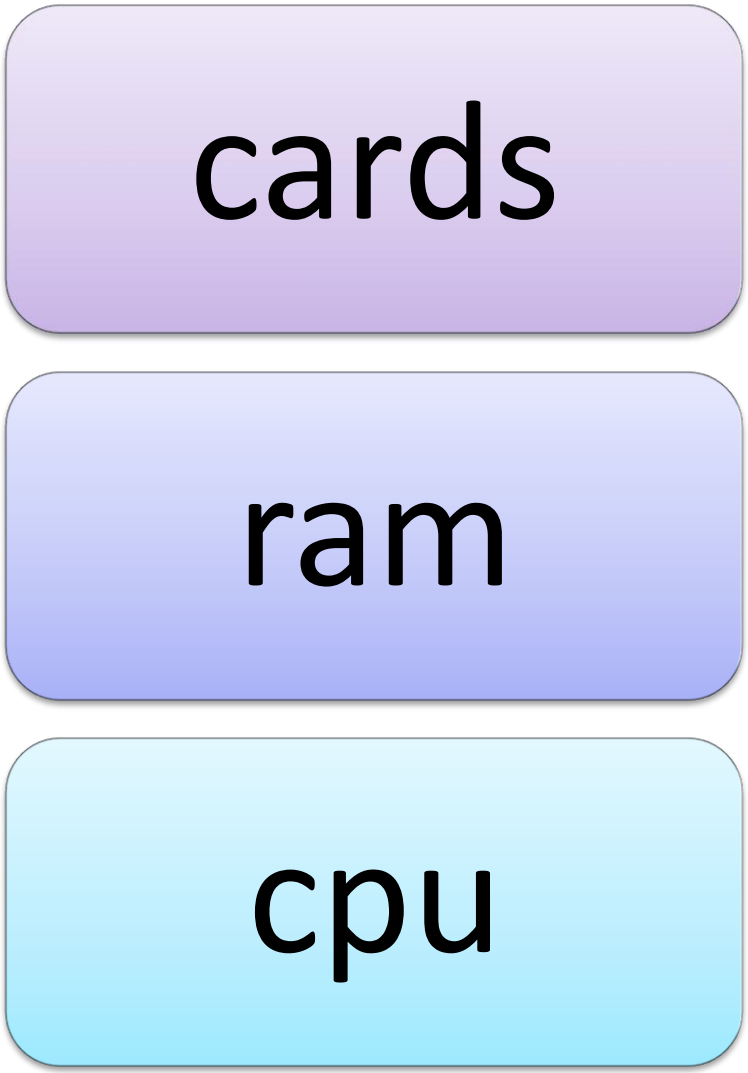
Motherboard: Old



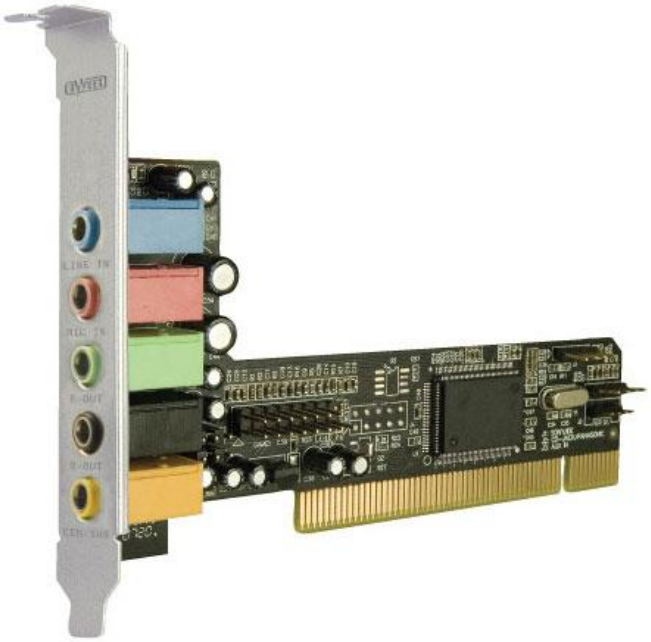
Motherboard: New



The motherboard limits choices for all other components:


cards
ram
cpu

cards



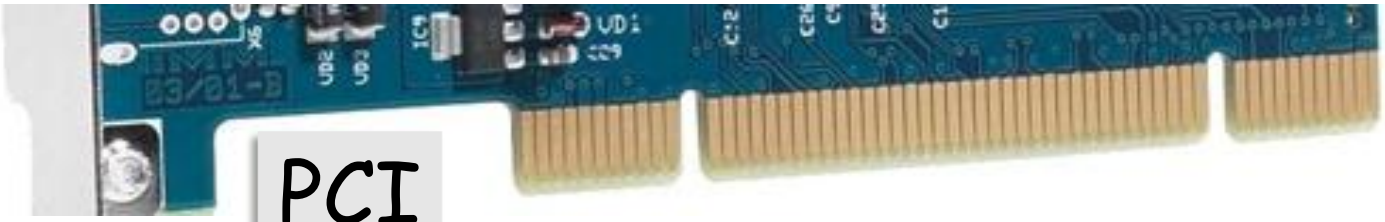
PCI DIGITAL AUDIO BOARD

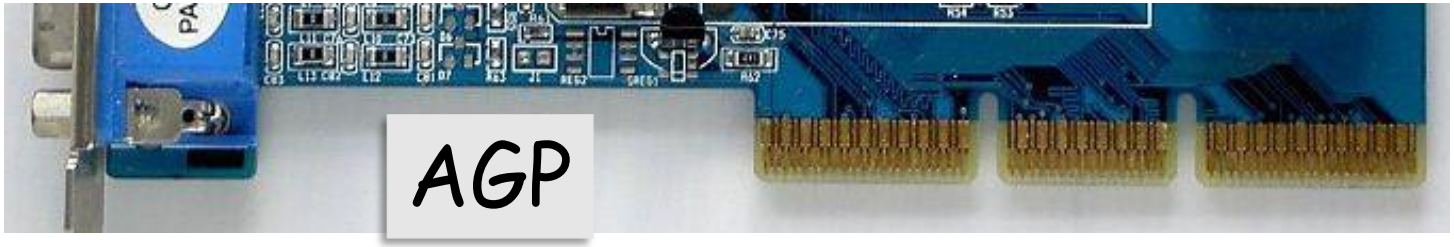
SE-200PCI LTD

Cards plug in to motherboard slots.

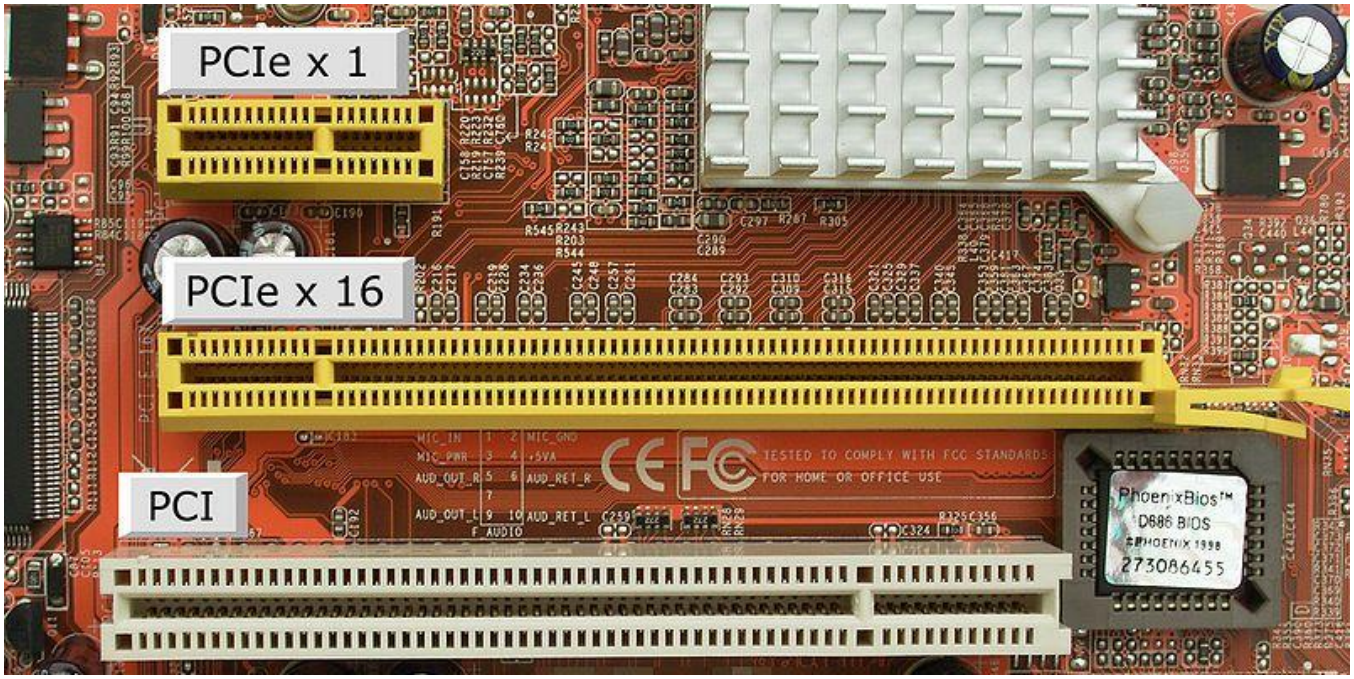
Card edge connectors

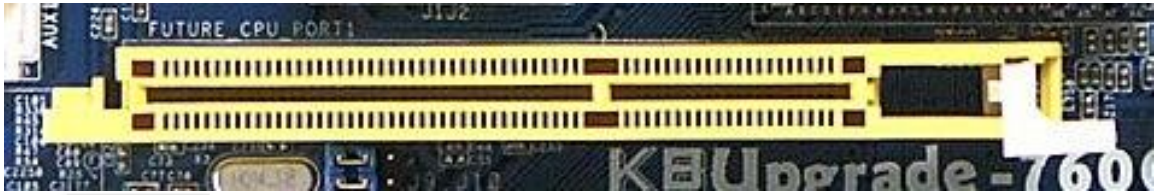
PCI-E


PCI


AGP

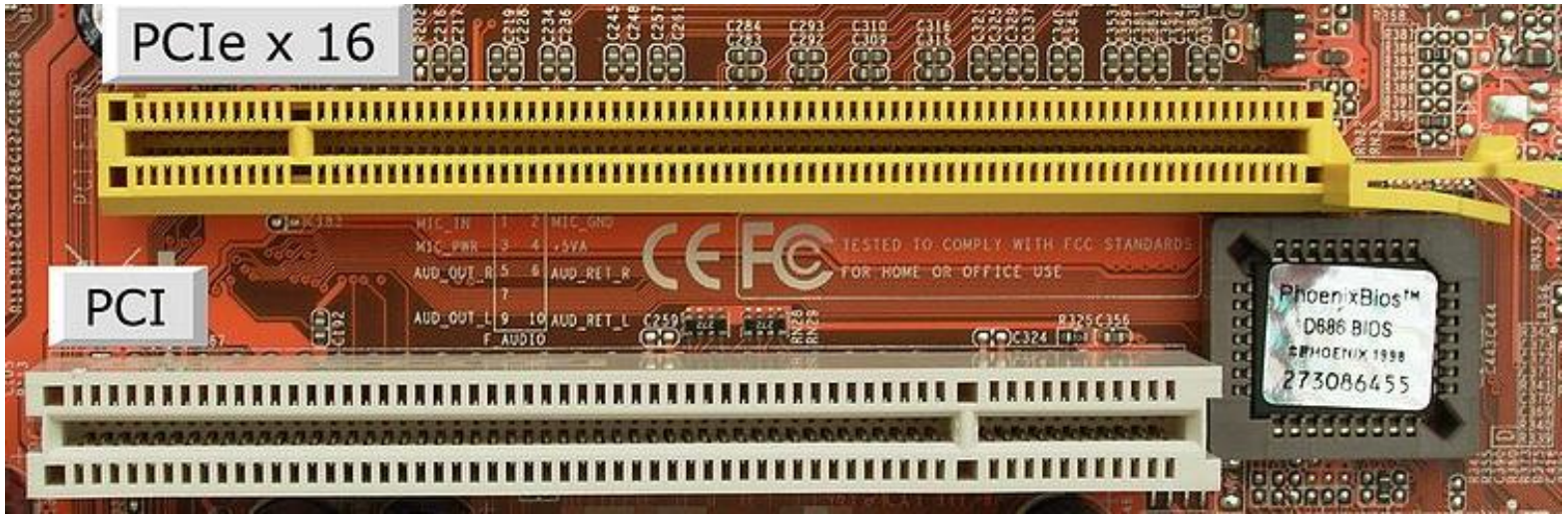
must match slots


PCIe x 1
PCIe x 16
PCI
TESTED TO COMPLY WITH FCC STANDARDS
FOR HOME OR OFFICE USE
PhoenixBios™
D686 BIOS
273086455


FUTURE CPU PORT1

AGP

(i.e., PCI-E cards won't fit or work in PCI slots)



So, the slots provided on your motherboard limit the types of cards you can use.

Cards provide ports for your peripherals.

Why are there different kinds of slots?

Part of the reason is historical.

1981

The ISA card

(Industry Standard Architecture)

8 bit, then 16 bit

4.7 MHz

1992

The PCI card

(Peripheral Component Interconnect)

32 bit, 33 MHz

1997

The AGP card

(Accelerated Graphics Port)

32 bit, 66-533 MHz

~2000

The PCI-X card

(Peripheral Component Interconnect eXtended)

64 bit, 133-533 MHz

2004

The PCI-E card

(Peripheral Component Interconnect-Express)

64 bit, up to 4000 MHz

Video cards have driven much of this need for speed

Video Cards

Modern videocards are like separate little computers.

They have their own Graphical Processing Unit and RAM.

Big LCD monitors (helpful for imaging work) are 1920x1200 or even 2048x1536.

Not all videocards handle those resolutions.

GPU, videocard ram and video ports (vga, dvi, hdmi) all matter

However, you do not need top-of-the-line videocards for most imaging work.

Why?

Because top-of-the-line videocards are built to render fast moving hi-resolution images in games.

So far, even when we do 3D stuff, it is usually just one rendering that might be rotated….

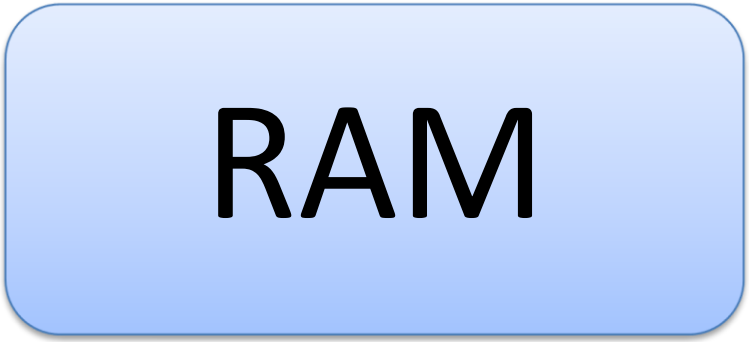
We want high resolution monitors, (maybe 2), and some fairly simple rendering.

512 MB of Video RAM and 2 DVI or HDMI ports will probably do the job.

Ethernet and sound are often built in, so you may not need any other cards.

You may want to make sure you have gigabit ethernet…so you can move big files across the network quickly.

Gigabit Ethernet card


RAM

More RAM (Random Access Memory) can manipulate more data at one time.

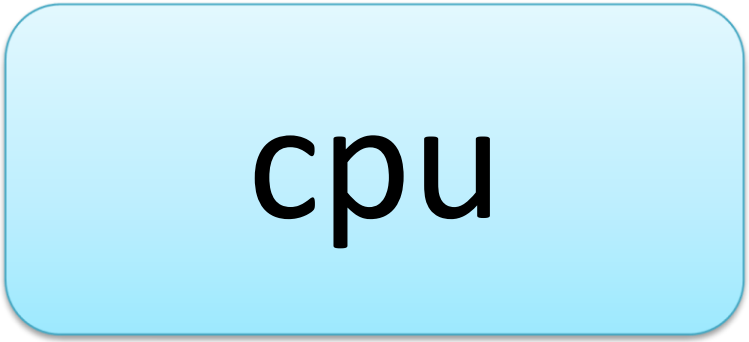
Faster RAM, can move data through more quickly.

Both speed and amount of RAM are important for imaging.

RAM

Motherboard slots hold one kind of ram (e.g, DDR2), and not the other…so the motherboard you have limits the amount and type (speed) of the RAM you can use.

Watch Out! Companies often save money by putting few RAM slots on motherboards, this really limits expansion! Videocards have their own ram, usually much faster than system RAM


cpu

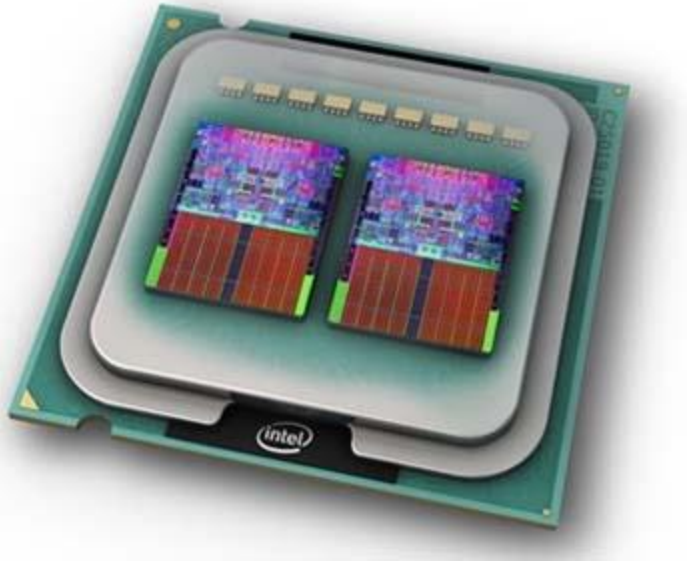
Processing

Number and speed of **CPUs** (central processing units) roughly determines processing capability of the machine (e.g., how fast it can do the mathematical operations)

CPUS

E5193788CC
A4
A80502-100
SX963/SSS

intel
Core 2 Extreme
quad-core


intel

Summary

- Purchase for the motherboard and cpu
  - And for RAM expandability.
- Understand what parts are compatible with your motherboard, and each other.

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sound card	CPU
ISA	GPU