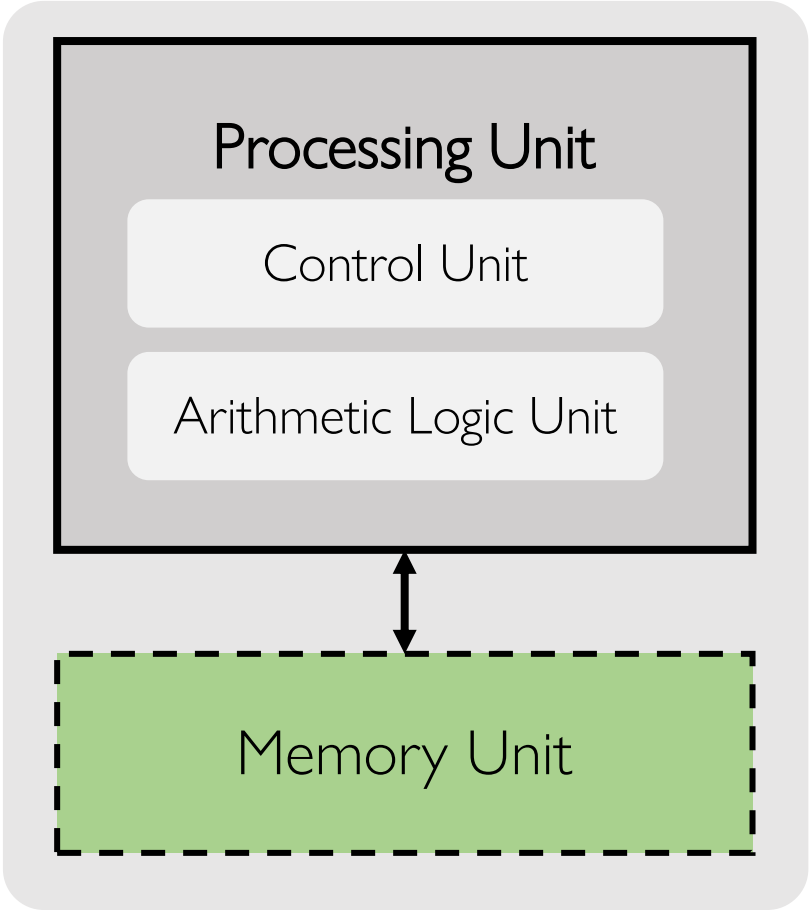
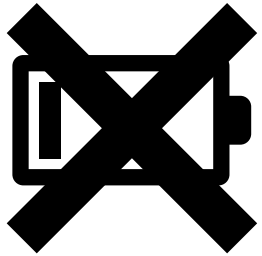
Computer Hardware : Memory

Von Neumann Architecture



Volatile Memory



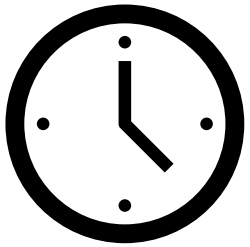
Loses data when it loses power

Non-volatile Memory

Retains data even if the power is off

Major Metrics

How fast?

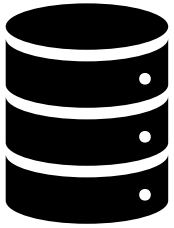


Access Time

Endurance

How many times can you write?

How big?



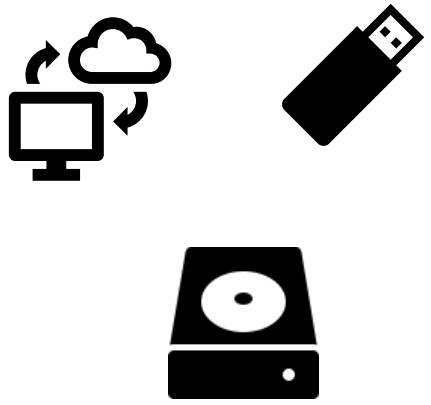
Capacity

Retention

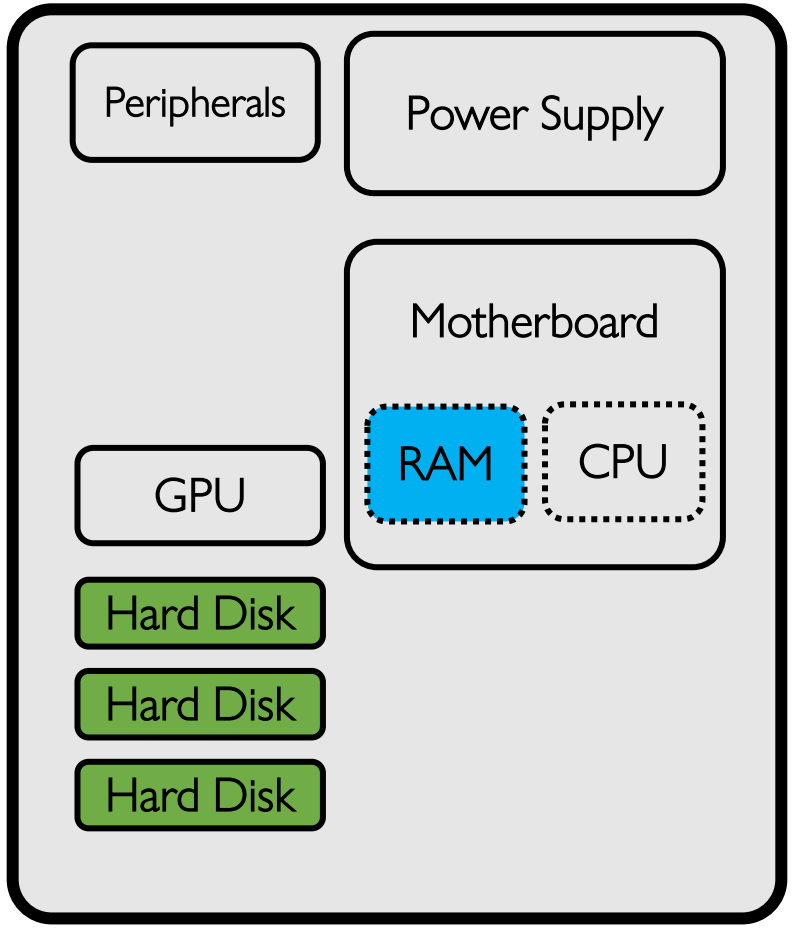
How long can it keep the data?

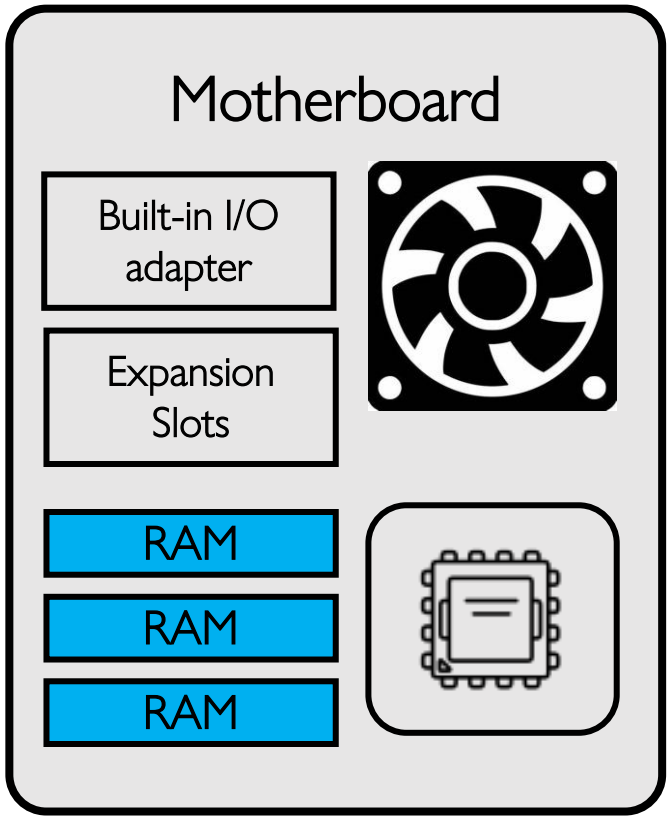
Memory Units

External Memory Or Secondary Storage

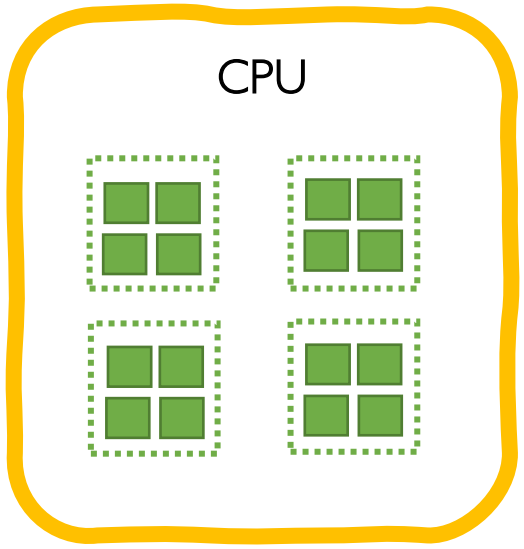


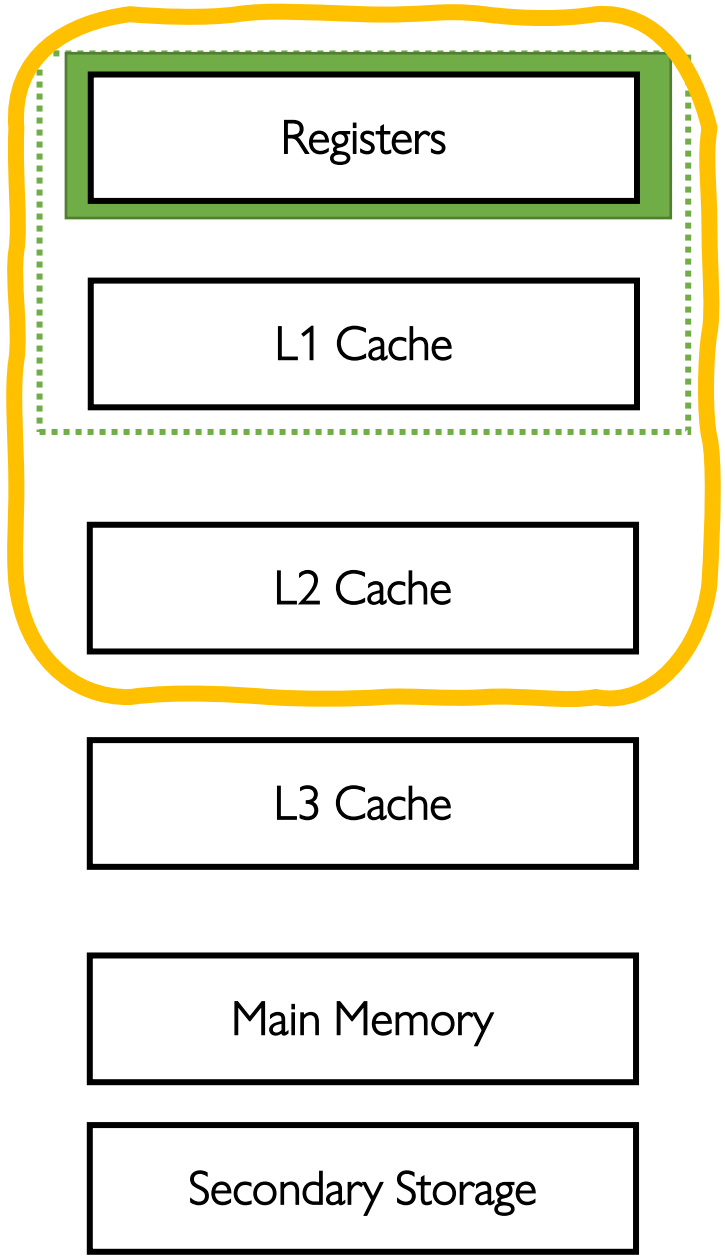
Internal

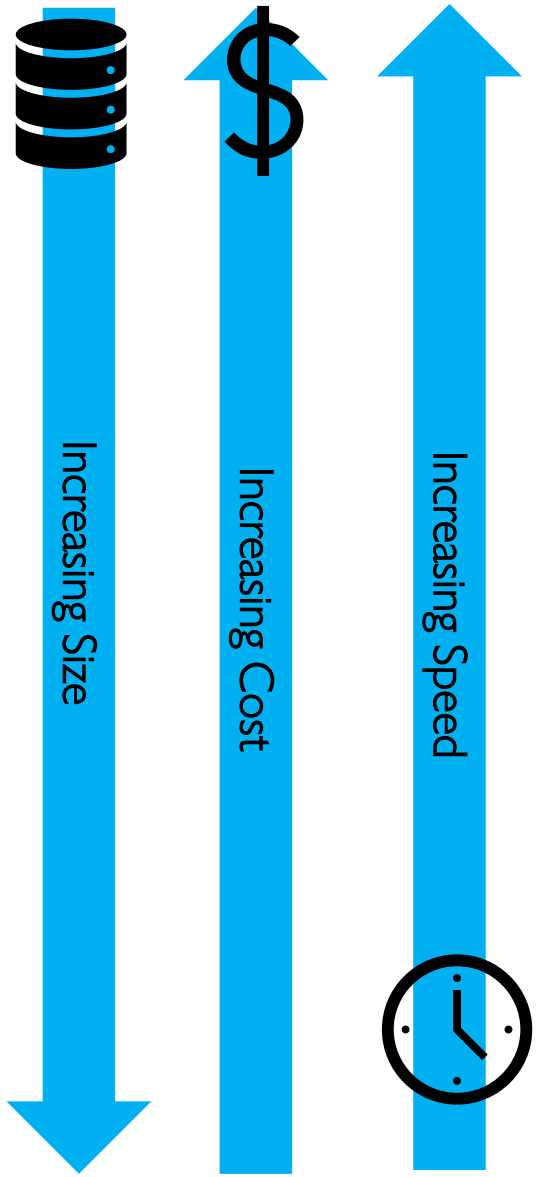




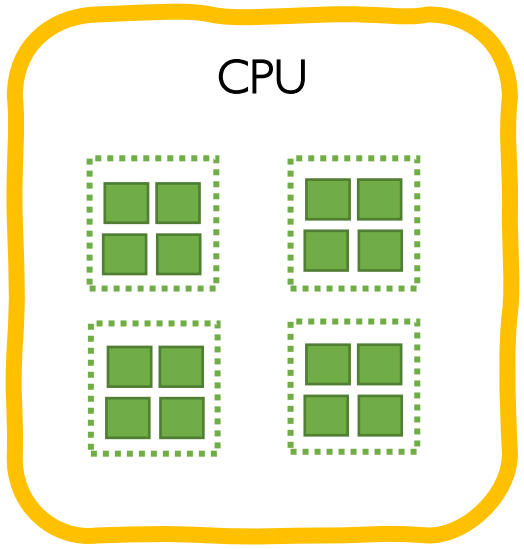
Memory Hierarchy

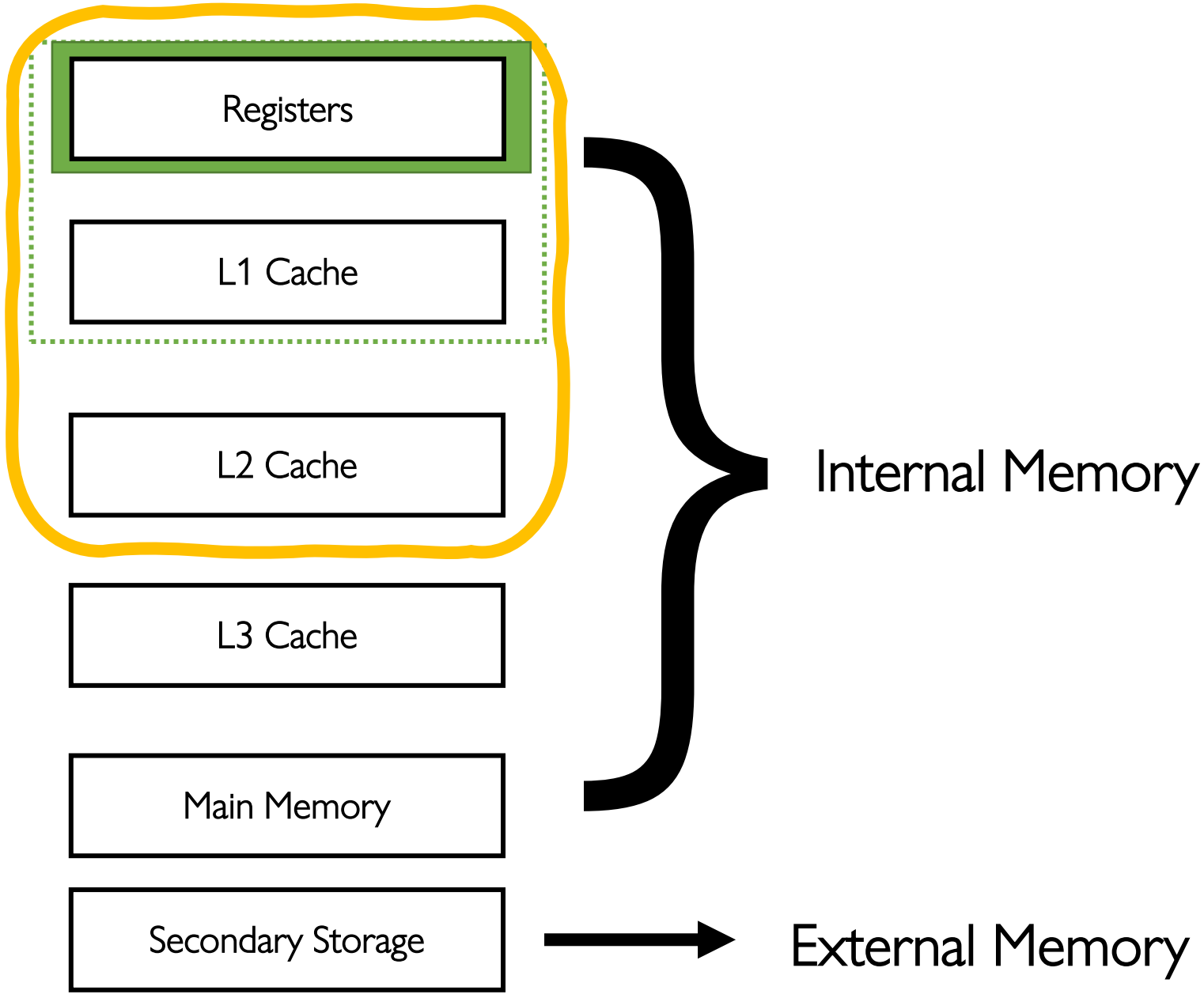






Memory Hierarchy





Technology used in Internal Memory

RAM

Random Access Memory

Volatile

ROM

Read Only Memory

Non-volatile

SRAM

Static RAM

Keeps data while powered on

DRAM

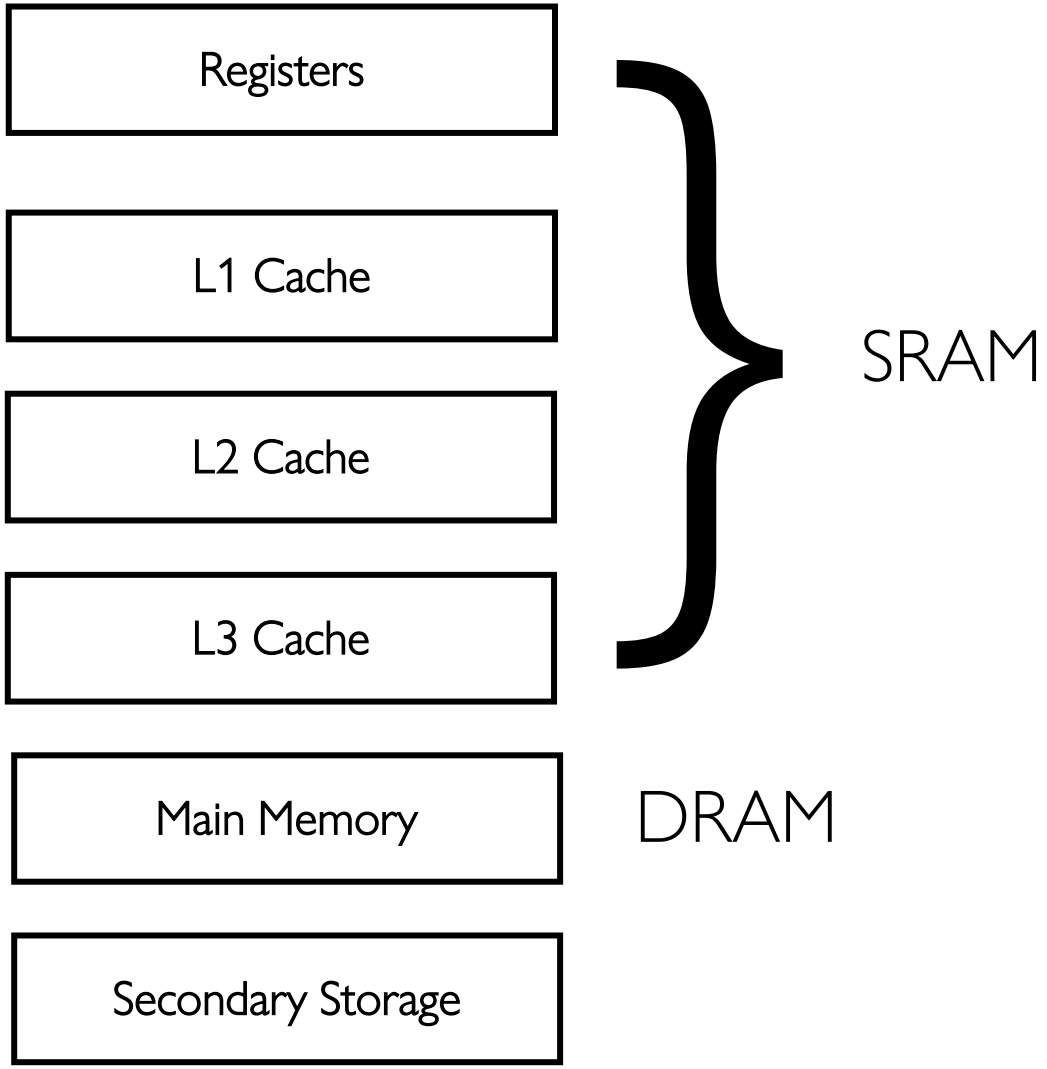
Dynamic RAM

Requires constant refresh to keep data

GDRAMs

Graphics DRAM

Memory Hierarchy



Technology used in External Memory

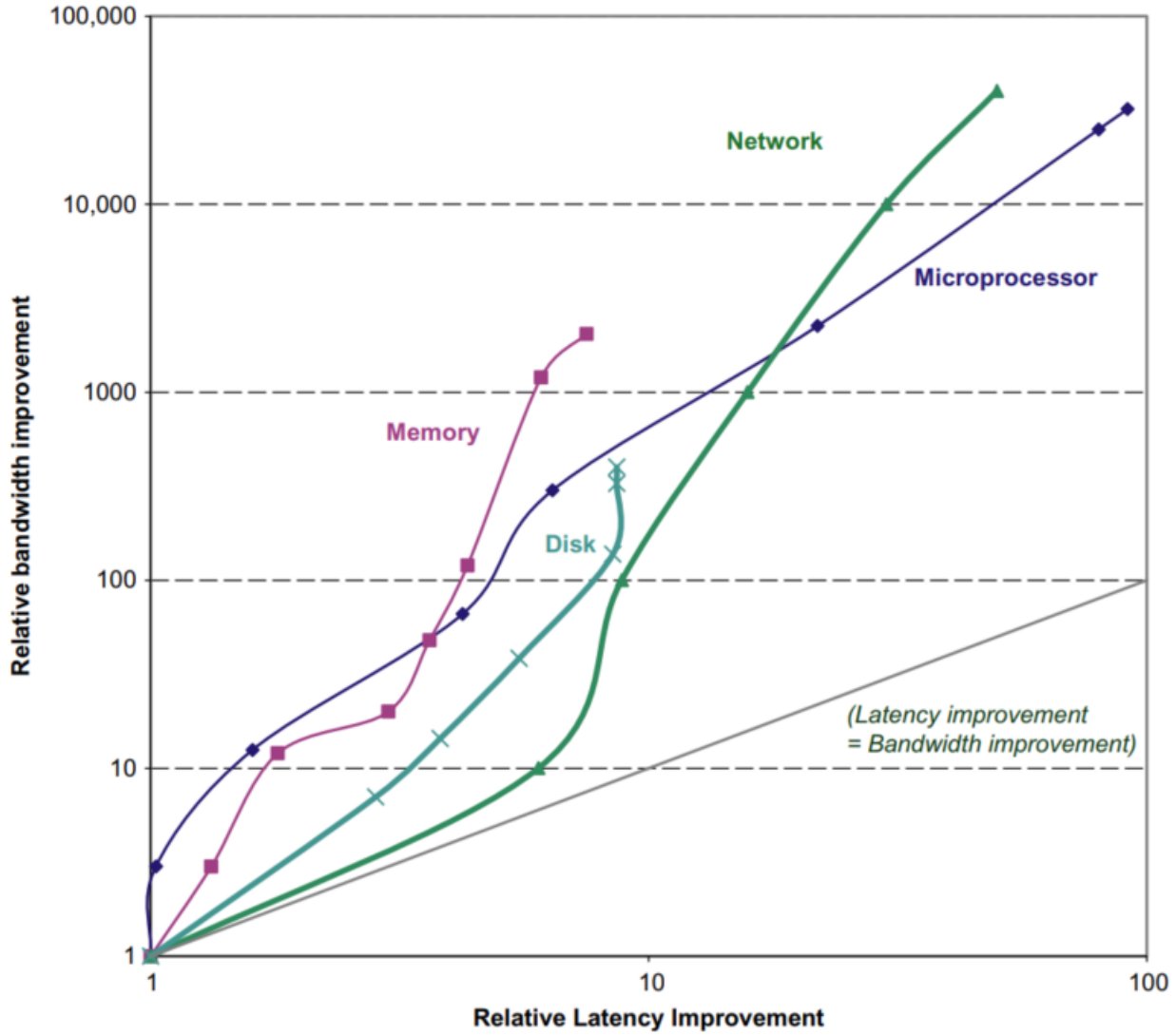
Magnetic Storage

Optical Storage

Cloud Storage

Flash Storage

Bandwidth & Latency milestones



From Patterson & Hennessy, Computer Architecture : A Quantitative Approach (6th Ed)

Activity:

- Find what specifications are available when buying a computing device. You can choose any computing device: mobile, PC, microcontroller.
- Categorize each of the specification with the following:
  - Input
  - Output
  - Processors
  - Memory

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THANK YOU

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