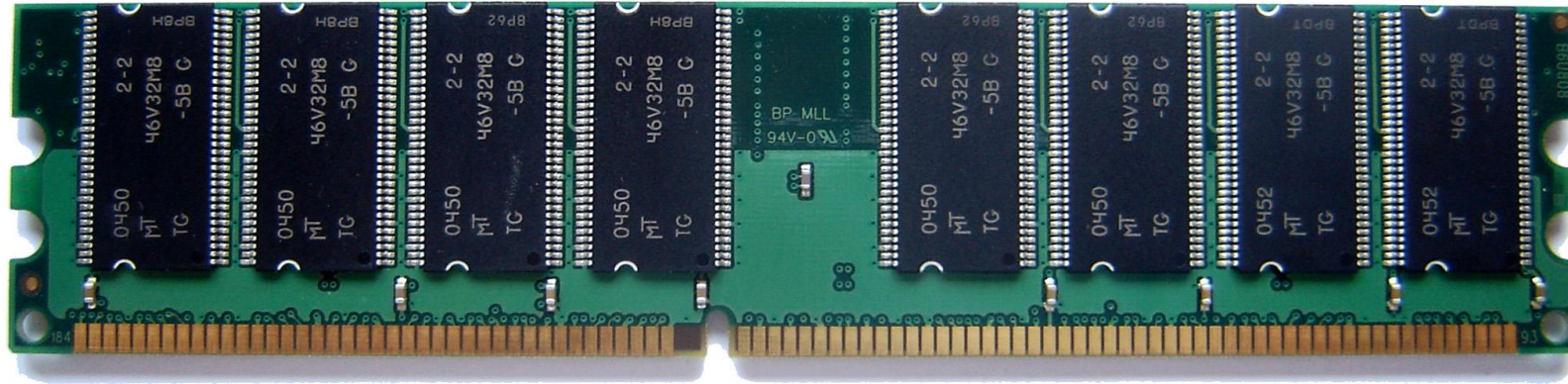


RAM

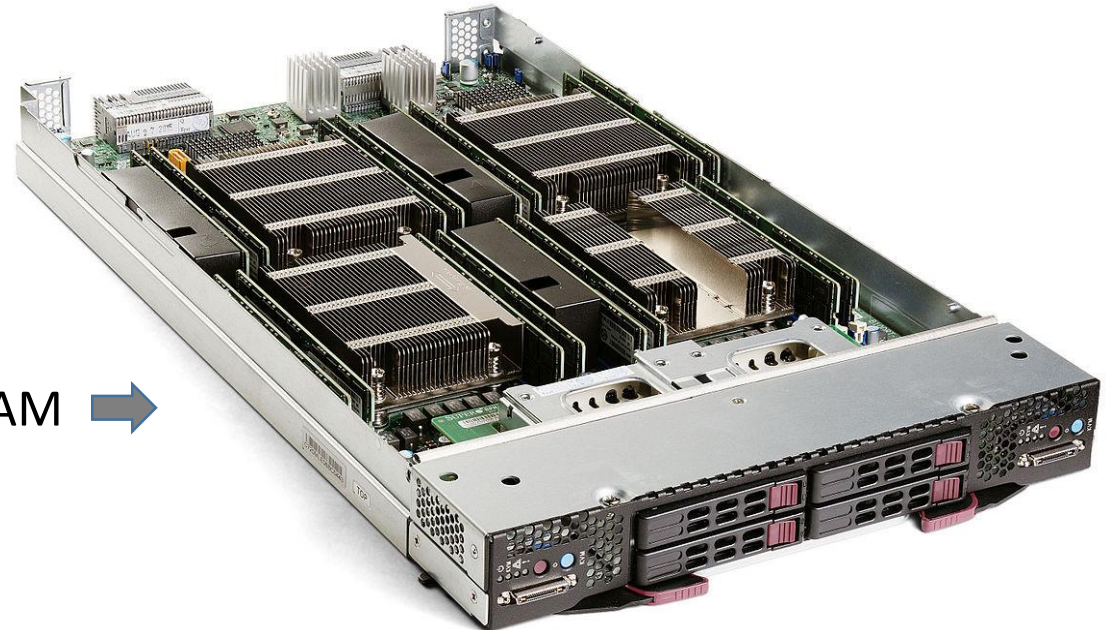
Describe the principles and operation of RAM



Random Access Memory (RAM) is volatile memory used to store data, files or part of an operating system which are currently in use. It can be read from and written to.

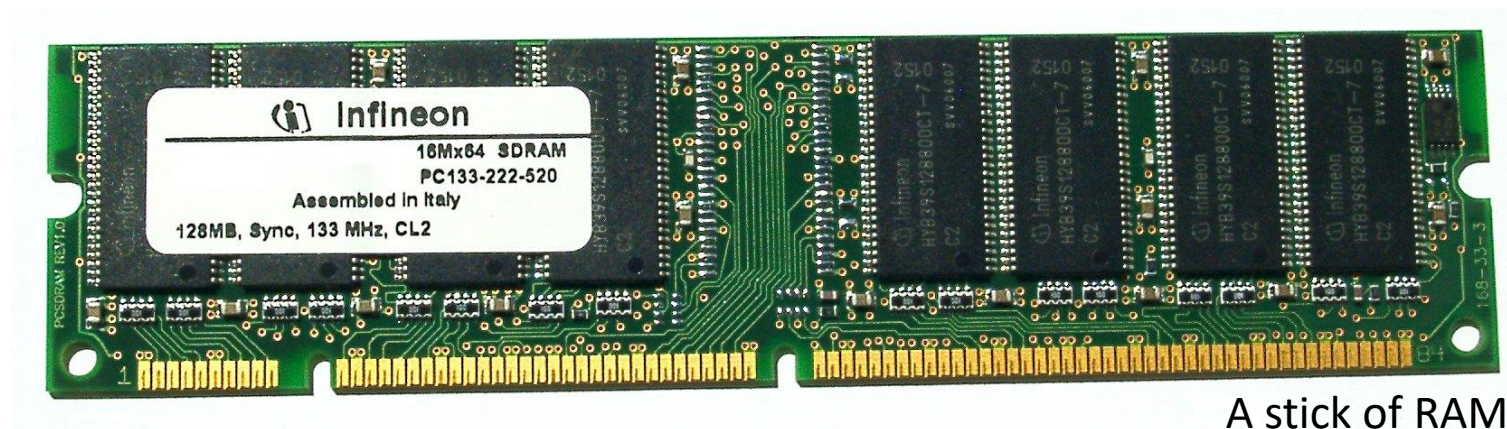
- The larger the RAM, the faster the computer will run.
- As RAM becomes full, the processor has to access the Hard-Disk Drive (HDD) to replace old data on the RAM with new data (from the HDD).
- By increasing RAM size, the number of times this access operation is done is reduced, making the computer run faster.

This server has lots of RAM ➡



DRAM

- **Dynamic RAM (DRAM)** chips are made up of numerous *capacitors* and *transistors*
- A capacitor holds a bit of information (0 or 1)
- A transistor is like a switch; it allows the control circuitry on the chip to read from or write to a capacitor.
- DRAM needs to be refreshed (capacitors need to be recharged) every 15 microseconds.
 - If they are not, they will lose their charge, and their values would be 0s.



A stick of RAM

SRAM

- Unlike DRAM, **Static RAM (SRAM)** doesn't need to be refreshed.
- Instead of capacitors and transistors, SRAM makes use of *flip flops* to hold bits of memory.
- SRAM also provides a faster access speed (typical DRAM access speed is 60 nanoseconds, while SRAM access speed is 25 nanoseconds).



Advantages of DRAM	Advantages of SRAM
Less expensive to manufacture	Doesn't need to be refreshed
Consumes less energy	Data access is faster
Has a higher storage capacity	

- RAM is a type of **primary memory**

Key terms:

- **Volatile** – this memory loses data when power off
- **Non-volatile** – permanent even when power off
- **Read** – this means to read data from the memory / storage
- **Write** – this means to save data to the memory / storage

Test your knowledge:

What does RAM stand for? _____

Is RAM primary, secondary, or offline storage? _____

What does volatile mean? _____ What does non-volatile mean? _____

Is RAM volatile or non-volatile? _____

Explain what it means to "read" data _____

Explain what it means to "write" data _____

Can RAM be read from, written to, or both? _____

What does RAM do? _____

What will happen if a computer does not have enough RAM? Be specific

What is a good description of RAM?
