

SOS POLITICAL SCIENCE AND PUBLIC ADMINISTRATION

MBA FA 401

SUBJECT NAME: COMPUTER APPLICATION IN  
FINANCIAL ADMINISTRATION

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TOPIC NAME: RANDOM ACCESS MEMORY

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# RANDOM ACCESS MEMORY



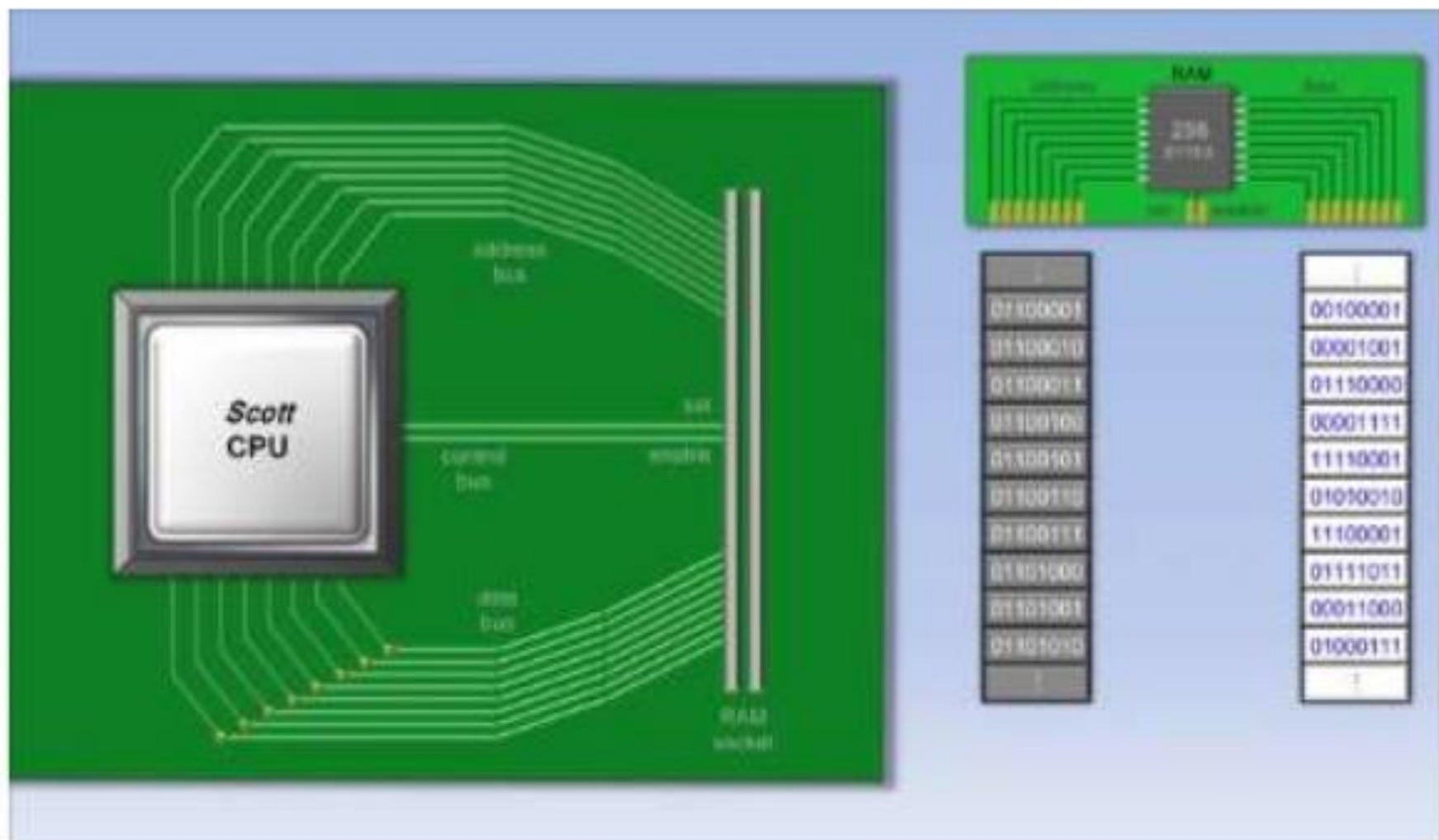
# RANDOM ACCESS MEMORY

Random Access Device allows stored data to be accessed directly in any random order. RAM is type of temporary storage media. It does not store data permanently. It is a type of Volatile memory. This means that RAM loses all its data once the power is turned off.



# How Does It Work ?

- When the computer first starts a program it sends an address to RAM to begin retrieving that program. The RAM address just consist a series of 1's and 0's representing 'ON' and 'OFF' wire.
- RAM does not do anything with that address until the CPU turns on the "SET" or "ENABLE" wire. If the enable wire is turned ON the RAM automatically senses the data corresponding to that address back to the CPU, that data is then processed by the CPU accordingly.





# TYPES OF RAM

RAM is basically of two types:

- Static RAM
- Dynamic RAM

Static RAM is a type of RAM that keeps the data fed to it. It never has to be refreshed. This makes static RAM significantly faster than dynamic RAM . Static memory cell takes up a lot more space on a chip than a dynamic memory cell. This makes Static RAM expensive than DRAM.

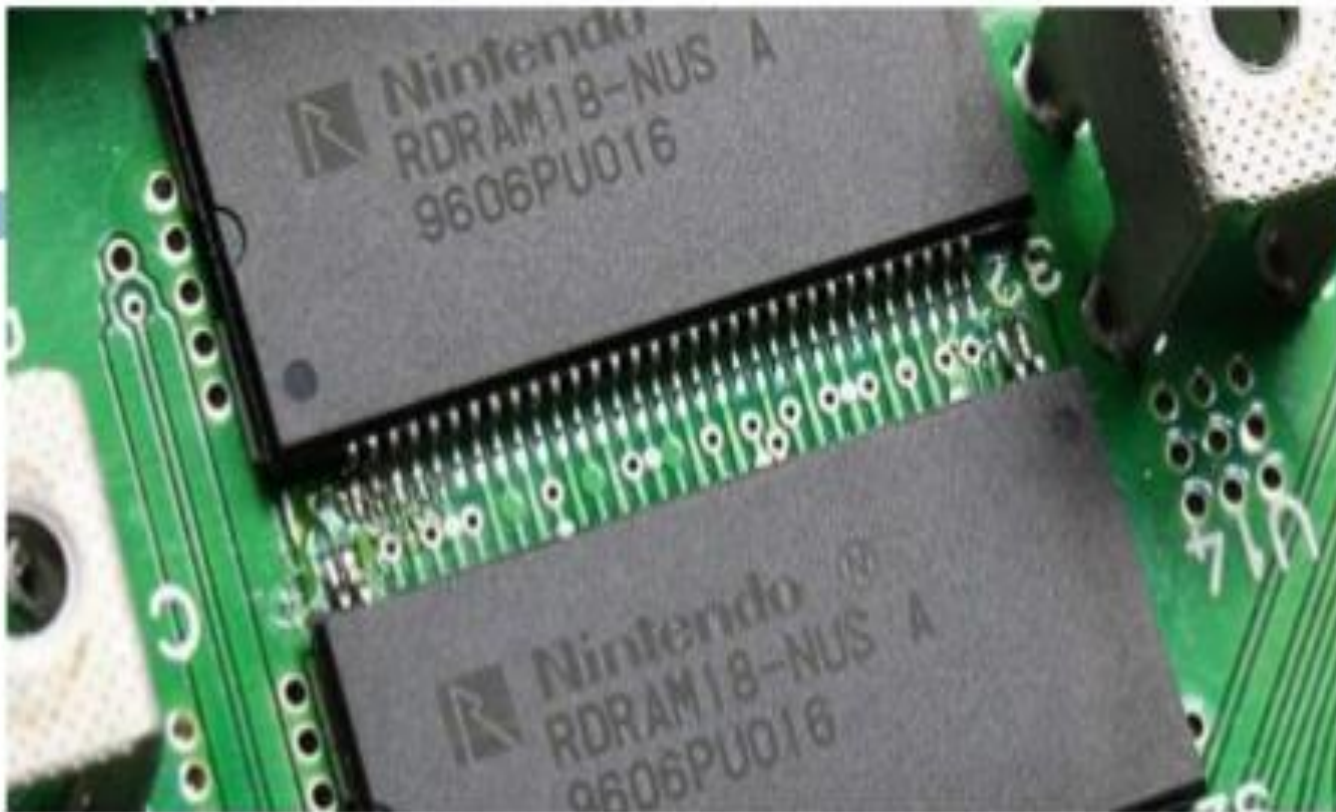
On the other hand, Dynamic RAM constantly needs to be refreshed otherwise the stored data will be lost.

# TYPES OF DRAM

- **FRM DRAM (Fast Page Mode Dynamic Random Access Memory)**:-It was the original form of DRAM. It waits through the entire process of locating a bit of data by column and row and then reading the bit before it starts on the next bit. Maximum transfer rate to L2 cache is approximately 176 Mbps.
- **EDO DRAM (Extended data-out Dynamic Random Access Memory)** does not wait for all of the processing of the first bit before continuing to the next one. As soon as the address of the first bit is located, EDO DRAM begins looking for the next bit. It is about five percent faster than FPM. Maximum transfer rate to L2 cache is approximately 264 Mbps.

- SDRAM is a type of dynamic random access memory which is synchronized with the clock speed that the microprocessor is optimized for. SDRAM is about five percent faster than EDO RAM and is the most common form in desktops today. Maximum transfer rate to L2 cache is approximately 528 Mbps.
- **DDR SDRAM: Double data rate synchronous dynamic RAM** is just like SDRAM except that it has higher bandwidth, meaning greater speed. It is a newer variant of SDRAM. Maximum transfer rate to L2 cache is approximately 1,064 Mbps .





- **random access memory** : Designed by Rambus, RDRAM uses a **Rambus in-line memory module (RIMM)**, which is similar in size and pin configuration to a standard DIMM. RDRAM memory chips work in parallel to achieve a data rate of 800 MHz, or 1,600 Mbps. Since they operate at such high speeds, they generate much more heat than other types of chips.

# WHAT IS CACHE ?

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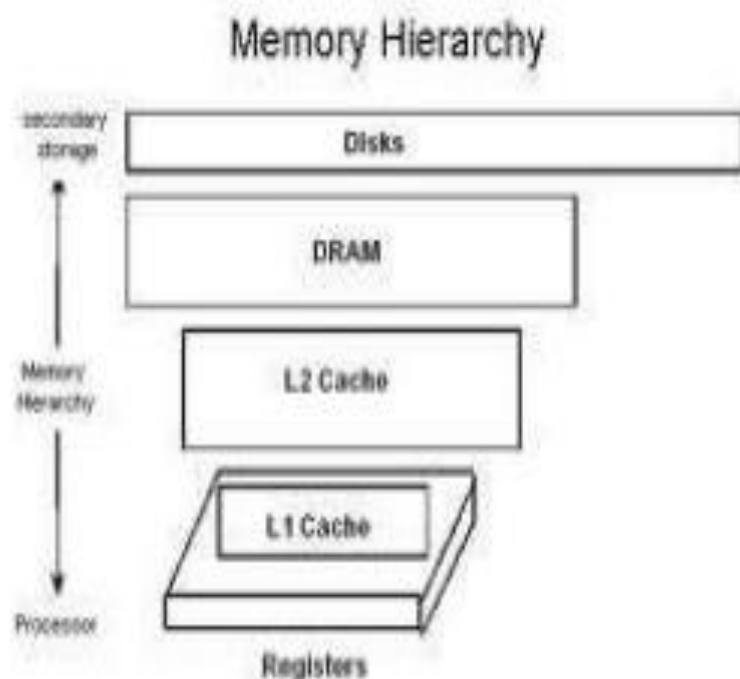
Cache Memory is fast memory that serves as a buffer between the processor and main memory. The cache holds data that was recently used by the processor and saves a trip all the way back to slower main memory. Types of Cache are:

- ❑ L1 Cache
- ❑ L2 Cache
- ❑ L3 Cache

# MEMORY HIERARCHY

The memory structure of PCs is often thought of as just main memory, but it's really a five or six level structure.

The first two levels of memory are contained in the processor itself consisting of the processor's small internal memory, or **registers**, and **L1 cache**, which is the first level of cache, usually contained in the processor.



- The third level of memory is the **L2 cache**, usually contained on the motherboard.
- The fourth level, is being referred to as **L3 cache**. This cache used to be the L2 cache on the motherboard, but now that some processors include L1 and L2 cache on the chip, it becomes L3 cache. Usually, it runs slower than the processor, but faster than main memory.
- The fifth level (or fourth if you have no "L3 cache") of memory is the **main memory** itself.
- The sixth level is a piece of the hard disk used by the Operating System, usually called **virtual memory**. Most operating systems use this when they run out of main memory,



# LIMITATION OF RAM

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- One of the biggest drawback of Random Access Memory is that it is a volatile memory. This means that whenever the computer is switched off all the data that was stored in the RAM is lost.
- Another limitation of RAM is space limitation. The cost per bit for RAM is high as compared to ROM, because of this reason it is not used for mass storage.

# CONCLUSION

- The amount of RAM matters more than the type of RAM. This is because more the RAM available in a system, more number of tasks can be performed simultaneously without any performance drop.
- Computers used nowadays comes with DDR2, DDR3 RAM. While RDRAM did not become popular due to high licensing fees, high cost, being a proprietary standard, and low performance advantages for the increased cost. It is being used in some graphics accelerator boards in place of VRAM and is also being employed in Intel's Pentium III Xeon processors

# FUTURE OF RAM...

- ❑ Future computers and electronic gadgets will need memory chips that are smaller, faster and cheaper than those of today .
- ❑ RRRAM (Resistive RAM) and Z-RAM (Zero-capacitor RAM) are runners in the global technology race as the next generation RAM.
- ❑ Innovative Silicon, developer of Z-RAM claims the technology offers memory access speeds similar to a standard SDRAM used in cache memory but uses only a single transistor, therefore affording much higher packing densities.
- ❑ On the other hand crossbar , a U.S based tech firm claims to have achieved a "simple and scalable" memory cell structure of RRAM consisting of three layers. The structure means cells can be stacked in 3D, squeezing terabytes of storage capacity onto a single chip the size of a postage stamp



THANK YOU