Status of Magnetic RAM

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ABSTRACT

This paper discusses the current status of Magnetoresistive Random Access Memory.

Keywords

Magnetic, RAM, MRAM, PCM Status

1. INTRODUCTION

As the name suggest, Magnetoresistive Random Access Memory (MRAM) uses magnetic storage rather than conventional methods associated with the flowing of electrical current. Magnetic memory is a non-volatile computer memory technology that has been under development since the 1990s, and it is suggested that it will one day become the universal memory of choice.

2. ADVANTAGES OF MRAM

The most significant advantage of MRAM, besides the obvious increase in speed, is that it is not reliant on an electric charge to refresh the cells a thousand times per second (as DRAM requires). MRAM data storage requires no electrical charge to store elements, therefore it retains the data even after being disconnected from a power supply. MRAM requires less power consumption, has quicker read and write cycles, has a lower probability for data loss, and does not have a foreseeable "death" due to decay as flash memory does.

Comparatively, MRAM has a high maximum storage capacity[1], even though the MRAM commercially released today still seems relatively small compared to DRAM. But the possibility for large capacities, once the technology is refined, is large and reliable.

3. IN THE MARKET

Micromem is currently developing an MRAM chip[2]. They have successfully created numerous chips, and they are currently refining the process, making the chip denser and in need of less power.

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Grading Rubric	Max	Earn
On Time/Format	1	
Correct	5	
Clear	2	
Concise	2	
TOTAL	10	

Researchers in Montpellier Laboratory of Informatics say that they have created the first MRAM-based FPGA circuit[3]. This implementation shows great possibilities in the future of the personal computer. A non-volatile MRAM-based FPGA doesn't lose stored data on power down or, worst case, a power-outage or brown-out. On power-up, data does not need to be reloaded into the system because it's already there.

A main target of MRAM is mobile devices due to its lower power consumption.

4. CONCLUSIONS

It does seem as thought security may become an issue with MRAM. Since data is not necessarily removed from MRAM on power down, the MRAM could be removed from the computer and read from its last state. However, this will likely be addressed soon enough, and even with this slight drawback that will undoubtedly be remedied, the advantages in speed, power consumption, and reliability of MRAM are great enough to make it something to definitely be excited for in the future.

5. **REFERENCES**

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