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Racetrack memory seems promising but it's still a work in progress
IBM

IBM Paves the Way to Nano-Scale Solid-State Drives

The new memory chips will be faster and more reliable

IBM is currently working on a new breed of memory chips, that is alleged to deliver extended reliability at cheaper costs than the existing DDRAM offerings. According to the company, the new type of memory is an interesting mixture of the technologies used in solid-state storage media and hard-disk drives.Shortly put, the "racetrack" memory will combine the absence of moving parts in SSDs with the inexpensive, non-volatile hard-disk storage media. Stuart Parkin, one of IBM's executives claims that the new product will be extremely solid and reliable.The racetrack memory is based on nanotechnology: data is stored in clusters of atoms caught in between a network of magnetic nanowires. When the atoms are still, the electrical charge forces the atoms into moving along a U-shaped pipe, where data is read. The whole process takes place in less than a nanosecond, which means that the new memory will sport extremely small latencies.More than that, Parkin claims that the read process is dramatically improved over the conventional technology, and the chips will be able to read 16 bits of data through a single transistor, which allows it to perform 100,000 times faster than the NAND-based flash memory."In flash memory and hard drives, one transistor can access 1 bit, or with flash, maybe 2 or possibly even 4 bits, that's it. We are going to use ... a transistor to access many bits of information."However, the project is still a work in progress, despite the fact that research has started about five years ago. The company expects to achieve storage capacities of terabytes in the upcoming years. "It will take two to four years to build a prototype in which we build these reading-and-writing elements on a nanoscopic scale. In four years we can perhaps demonstrate it works and then manufacture it," Parkin said.