

**IBM Discovers The Power Of One**

Its focus on a single chip line makes it a contender in almost every market

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For a proud tech industry leader, the situation couldn't have gotten much worse than what IBM (IBM ) faced in the summer of 2003. The company's semiconductor unit, which had bet on a strategy of manufacturing all kinds of chips for all comers, had lost \$1.2 billion over the previous 18 months. Big Blue was also spending billions to upgrade its chip plants -- and getting thrashed by Asian rivals that were manufacturing at much higher volumes and offering bargain-basement prices. It was a full-blown crisis. "We were in danger of being marginalized," recalls William M. Zeitler, senior vice-president in charge of the systems and technology group.

That called for a meeting of some of IBM's best minds. So on July 15, 2003, starting at 7 a.m., Chief Executive Samuel J. Palmisano, Zeitler, and about 70 others from the company's then-separate chip and computer divisions gathered in a conference room at Harvard University to come to grips with the situation. By the end of a long day, they had charted a new course. The chip and computer units would be combined. Rather than manufacturing all kinds of chips for 400 customers, IBM would focus primarily on one family of chips, its well-regarded Power microprocessors. It would make some of the chips for its own use and others for key partners' products, including Nintendo (NTDOY ) game consoles, Apple (AAPL ) G5 computers, and Cisco Systems (CSCO ) networking gear. It would also recruit co-investors to help fund advances in chip manufacturing technology.

That high-stakes strategy shift is starting to pay off. Advances in Power chips have not only helped IBM gain share in high-end servers, they also have landed Big Blue the coveted role as processor supplier for next-generation game consoles to Sony (SNE ), Microsoft (MSFT ), and Nintendo. That's 100% market share. IBM has especially high hopes for the Cell chip, the brains of Sony Corp.'s PlayStation 3 console, which is based in part on IBM's Power technology and is being co-developed by Sony, IBM, and Toshiba (TOSBF ). The partners are poised to reveal details at a chip industry conference on Feb. 7. One hint of what's to come: Cell will include a cluster of Power processors, making it 10 times more powerful than today's contenders. If the momentum continues, IBM could emerge as a much more potent force in the processor realm.

**TRICKY BUSINESS**

There's a strategic reason for the Power Everywhere approach: Scale makes all the difference in the chip business. Right now, IBM has just 5% of the total 365-million-unit processor market, according to Gartner Inc., vs. about 50% for mighty Intel Corp. (INTC ) By concentrating on one family of chips and boosting its share of the processor market, IBM can make larger batches and do it more efficiently. The goal: to generate enough profits so it can invest heavily and stay on the cutting edge. "We want the Power architecture to be the foundation of the best-performing, most affordable, and most flexible computing systems," says Zeitler.

IBM will have to overcome some hurdles to accomplish that. Making circuits 1/1000th the width of a human hair is a tricky business, and one misstep could leave IBM behind. It ran into problems last year while switching to the latest manufacturing methods for Apple Computer Inc.'s processors, earning the

company a public rebuke from Apple. The problem took more than six months to fix. A spokesman for Intel said IBM has not proven it can produce processors efficiently in high volume.

IBM's other major challenge is the momentum of Intel and Advanced Micro Devices Inc (AMD ). The pair's low-cost, high-powered processors began being used in servers a decade ago, and since then they've gained huge chunks of the market. Last year, for the first time, sales of servers that run on Intel and AMD chips exceeded sales of the Unix servers, which included computers that run Power chips. So while Power has been gaining share within the Unix slice of the server market, that slice has been shrinking. IBM needs to halt Intel and AMD's advance or face a squeeze in the server market. Hewlett-Packard Co. (HPQ ), which dropped its own high-end processor design in favor of Intel's, expects its servers will be able to match IBM's in performance and beat them on price. "Any advantage IBM could have over us by developing its own chips is negligible," says Mark Hudson, HP's marketing vice-president for enterprise servers. If HP is able to deliver on that claim, IBM will be in serious trouble.

Based on the gains IBM has achieved in the past couple of years, though, it has a solid chance of success. Its chip business turned profitable last year, although IBM no longer breaks out specific revenues and income for that segment. That, coupled with its strategy of finding co-investors for its chip-making capabilities, is helping it stay on the leading-edge of chip manufacturing. On Jan. 5 the company announced a \$1.9 billion extension to its newest chip plant, along with partners Sony, Toshiba Corp., and others. And Big Blue's success in high-end servers and the fast-growing game market has experts convinced its Power processor is headed for steep growth. Analyst Tony Massimini of Semico Research Corp. figures IBM could easily be stamping out 70 million Power processors a year by 2007, up from about 15 million last year.

Up until now, most of Power's gains have come in the high-end server world. Improvements in its server processors helped boost its market share in Unix servers from 15.2% in the third quarter of 2000 to 26.6% in the same quarter of 2004, even while the overall Unix market declined 46%. That puts IBM within striking distance of HP and Sun Microsystems Inc. (SUNW ), with 32% and 29%, respectively, according to market researcher IDC. With the introduction of the Power5 chip last year, an IBM server ran a standard data-processing job nearly three times faster than the previous record, says the nonprofit Transaction Processing Performance Council. Typically, server companies leapfrog each other when they come out with new models, but analysts say IBM may be able to sustain its lead.

## SWARM OF GADGETS

IBM is doing even whizzier things with supercomputers. In a radical shift, its new Blue Gene model uses tens of thousands of inexpensive embedded Power processors -- the type used in cell phones. The company also produced chip innovations for cooling and speeding communications within the computer. The result: a machine that broke the supercomputing speed record late last year and still holds it. The first Blue Gene cost \$100 million, one third the price of the supercomputer it beat out.

Servers and supercomputers are familiar turf for IBM, but if it can hit a home run with Cell, it could vault into the lead in a promising new market. While the chip was originally conceived for PlayStation 3, due out in 2006, Cell is now aimed at a swarm of consumer devices -- from high-definition TVs to mobile gaming gadgets. The Power technology is well suited to these applications because it's cool-running and, in the Cell design, capable of handling a deluge of demands -- rich graphics, video processing, and real-time communications. If all of these efforts deliver as IBM hopes, the Power processor will finally live up to its name.

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