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A Tech Trio's Hard Cell

IBM, Sony, and Toshiba hope designers will master new skills to tap the full potential of their jointly developed chip. History says that's a big "if"

Twenty-two million units ain't bad for a brand new chip. That's the prospect for Cell in its first two years, when the innovative offering ships with Sony's (SNE) new Playstation 3 console. But that won't be enough to satisfy IBM (IBM). Big Blue, along with Toshiba and Sony, developed the chip over a period of four years, costing the partners over \$400 million.

IBM thinks Cell's innovative design is a perfect fit in televisions, set-top boxes, and a host of multimedia applications -- everything from entertainment to medicine and defense. The hurdle, however, is getting developers to write special software for Cell's unusual architecture. "Cell is not good for general purpose code," says Kevin Krewell, editor-in-chief of The MicroProcessor Report, "The challenge is programming it."

This fall, IBM hopes to give developers a jump start. It plans to release the Linux Operating System for the chip, along with other open-source software samples that developers can use with the IBM's proprietary development tools. It's a bet to position Cell in emerging markets for entertainment devices as technology continues to infiltrate the home.

"BIG OPPORTUNITY." By providing open-source tools, IBM hopes to inspire software developers to take advantage of the chip's extraordinary multimedia capabilities, encouraging them to create new and innovative applications, says Ted Maeurer, the Software Manager at the Sony Toshiba IBM Design Center based in Austin, Tex. The chip is challenging, but if its demands can be widely met, Cell could become a digital home standard.

So far, analysts like what they see: "Cell is a positive development in IBM's strategy," says Richard Petersen, a research analyst for Pacific Crest Securities. "There's a big opportunity as computing and entertainment morphs together...and the Cell chip is really optimized for that."

The announcement comes as part of a broader move by IBM to tap into the power of open source. In December, IBM pulled together companies that license its Power Architecture chips to form Power.org. In the initiative, IBM provides developers with chip specs and open-source development tools to encourage collaboration, and help developers come up with new uses for IBM chips.

APPLE'S DEFECTION. Cell has special potential because of its unusual design: Unlike a standard chip, it is divided into one central processor and eight separate "cores" -- smaller dependent processors. The central processor divvies up and assigns tasks to the surrounding cores very quickly, helping the chip to handle data-heavy tasks like streaming high-definition video, sound, and other multimedia applications.

The Cell is a bright spot in IBM's chip business, which has been trying to recover from severe losses in 2002 and 2003, when the unit saw losses of \$1.2 billion (see BW Online, 2/3/05, "IBM Discovers the Power of One"). More bad news came on June 6, when Steve Jobs announced that Apple would no longer use chips from IBM's power series, opting instead for Intel (INTC) chips (see BW Online, 6/7/05, "Apple Hits the Intel Switch").

When Playstation 3 debuts, it "should add at least a cent or two a share to IBM's earnings," says Petersen. Pacific Crest Securities expects Playstation 3 will ship 22 million units in its first two years. That's significant: The industry forecast for PCs in 2005 is 195 million. The industry forecast this year for units of servers (though each has a few chips) is 8 million. IBM also is supplying Nintendo and Microsoft (MSFT) with chips for their video-game consoles.

EYE IN THE SPY. Emerging markets in digital multimedia could be even bigger than the PS3. Worldwide unit sales of digital TVs and set-top boxes, two promising Cell applications, will reach 76.4 million and 81.4 million in 2007, respectively, according to iSuppli. Toshiba plans to release a high-definition TV using Cell in 2006.

Even newer applications could include devices like home multimedia servers, where users could connect and manage their television, stereo, computer, and phone line. Outside of entertainment, IBM also says it is currently in talks with customers about developing a medical product for X-ray analysis, and a defense-related product that could use the chip to analyze surveillance images.

It's not a sure bet that IBM can effectively grab a share of any of these markets. The digital TV and set-top box markets are already crowded with competing proprietary chip designs from the likes of STMicro Electronics (STM) and MIPS Technologies (MIPS), says Tony Massimini, technology chief at Semico, a semiconductor consulting and research firm.

NOT THE FIRST TIME. "There is no clear leading technology right now" adds Massimini. "That area is still in its infancy." If IBM can get developers excited enough about the chip to develop open-source software for these uses, it could become the industry standard.

Similar strategies have been tried before -- without much luck. In 1999, Sony similarly predicted that PlayStation 2's Emotion Engine, a MIPS-based processor developed as a joint-venture with Toshiba, would find uses in myriad different multimedia devices, from DVD players to Internet set-top boxes. That chip was also a challenge to software writers, and the plan didn't pan out. It's hard to find an Emotion Engine at work anywhere but in the PS2.

IBM's Maeurer acknowledges that precedent, but argues that his company's move to supply open-source software with the chip will give it an edge in getting developers to learn to program for Cell. "The industry is at a different point than it was. Now the open-source movement is very well established," says Maeurer. "There's a healthy base of open-source code."

HOT WHEELS. Maeurer may have a point, although it's still too early to tell how programmers will find Cell. Even PlayStation 3 game writers have only recently received development kits in the mail.

While licensing the chip that drives the entire digital home would be quite a coup, IBM is likely to be happy for now with the knowledge that there is plenty of money to be made when its chip ends up just powering video games.

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