

Key Details of the Cell Chip

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Innovative Design Delivers More Than 10 Times the Performance of the Latest PC Processors

At the International Solid State Circuits Conference (ISSCC), IBM, Sony and Toshiba for the first time disclosed in detail the breakthrough multi-core architectural design - featuring supercomputer-like floating point performance with observed clock speeds greater than 4 GHz - of their jointly developed microprocessor code-named Cell.

The chip that is expected to challenge the dominance of Intel and AMD, is a result of a joint development of IBM, Sony and Toshiba. A team of engineers, have been collaborating on the development of the Cell microprocessor at a joint design center in Texas, since March 2001. The prototype chip, fabricated with 90 nanometer SOI technology, is 221 mm², integrates 234 million transistors. The Cell will be used in Sony's future computer entertainment systems.

The companies claimed that Cell's breakthrough multi-core architecture and ultra high-speed communications capabilities deliver vastly improved, real-time response for entertainment and rich media applications, in many cases 10 times the performance of the latest PC processors.

Effectively a "supercomputer on a chip" incorporating advanced multi-processing technologies used in IBM's sophisticated servers, Sony Group's computer entertainment systems and Toshiba's advanced semiconductor technology, Cell will become the broadband processor used for industrial applications to the new digital home.

Another advantage of Cell is to support multiple operating systems, such as conventional operating systems (including Linux), real-time operating systems for computer entertainment and consumer electronics applications as well as guest operating systems for specific applications, simultaneously.

Initial production of Cell microprocessors is expected to begin at IBM's 300mm wafer fabrication facility in East Fishkill, N.Y., followed by Sony Group's Nagasaki Fab, this year. IBM, Sony Group and Toshiba expect to promote Cell-based products including a broad range of industry-wide applications, from digital televisions to home servers to supercomputers.

Among the highlights of Cell released :

Cell is a breakthrough architectural design -- featuring eight synergistic processors and top clock speeds of greater than 4 GHz (as measured during initial hardware testing)

Cell is a multicore chip capable of massive floating point processing

Cell is OS neutral and supports multiple operating systems simultaneously

Full list of features can be found at [PhysOrg Weblog story](#)

"Today's disclosure of the Cell chip's breakthrough architectural design is a significant milestone in an ambitious project that began four years ago with the creation of the IBM, Sony and Toshiba design lab in Austin, Texas," said William Zeitler, senior vice president and group executive, IBM Systems and Technology Group. "Today we see the tangible results of our collaboration: an open, multi-core, microprocessor that portends a new era in graphics and multi-media performance."

"Today, we are very proud to share with you the first development of the Cell project, initiated with aspirations by the joint team of IBM, Sony

Group and Toshiba in March 2001," said Ken Kutaragi, executive deputy president and COO, Sony Corporation, and president and Group CEO, Sony Computer Entertainment Inc. "With Cell opening a doorway, a new chapter in computer science is about to begin."

"We are proud that Cell, a revolutionary microprocessor with a brand new architecture that leapfrogs the performance of existing processors, has been created through a perfect synergy of IBM, Sony Group and Toshiba's capabilities and talented resources," said Masashi Muromachi, corporate vice president of Toshiba Corporation and president & CEO of Toshiba's Semiconductor Company. "We are confident that Cell will provide major momentum for the progress of digital convergence, as a core device sustaining a whole spectrum of advanced information-rich broadband applications, from consumer electronics, home entertainment through various industrial systems."

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