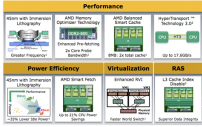


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By: Ionut Arghire, Hardware Editor

Innovations new to this generation



AMD's 45nm Shanghai chip brings a range of enhancements
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[AMD Starts Shipping the 45nm Shanghai Today](#)

The new 45nm chip brings 35 percent more performance compared to its predecessors

Advanced Micro Devices announced quite a while ago the release of a new server microprocessor, code-named Shanghai; it has officially introduced it today. The chip is manufactured using the 45 nanometer process technology and is said to be able to deliver improved performance and energy savings. According to the Sunnyvale chip maker, its Shanghai Opteron processor line will be widely available and is meant to replace the company's former processor line, Barcelona, which came to the market with a delay of a few months due to production glitches.

The new chips are able to deliver up to 35 percent more performance than Barcelona, while also using about 35 percent less power. Moreover, the chip is expected to come at a lower cost than competitive products from Intel. AMD will manufacture nine versions of Shanghai at launch, five of which are in the 2-way Opteron 2000 series, while four in the 8-way Opteron 8000 series. Burke Banda, product marketing manager for the server and workstation division of AMD, said that a four-socket system version would also be available. The prices for the two-socket models range from \$377 to \$989 at launch, while the 8-way series is priced between \$1,165 and \$2,149.

The chipmaker stated that it used improved design methods for the chip, including the 45nm immersion lithography technology, which led to leveraged clock speeds ranging from 2.3 to 2.7GHz. Shanghai features support for DDR2-800Mhz memory, as well as a larger 6MB Level 3 cache. Moreover, the company announced that its streamlined manufacturing process would allow it to make further improvements to the chip during the next year. Enhancements include Direct Connect Architecture with coherent HyperTransport 3.0, which could provide up to 17.6GB per second of bandwidth for processor-to-processor communication on the 5690 chipset it is paired with.

Shanghai comes with a new energy-saving feature called Smart Fetch, which is able to temporarily shut down cores while idling, having "zero impact on application performance or data already in the cache," as the company claims. Besides, AMD's CoolCore technology, meant to shut down unused sections within each core, is said to have been extended to the Level 3 cache, allowing for parts of the cache to also be turned off independently to save power.

AMD plans enhanced Shanghai chips for the next year

According to the Sunnyvale chip maker, significantly faster "world switch" time and improved hardware-based virtual memory management will be noticed by virtual machine users. The Shanghai processor allows for upgrading at reduced costs, since it uses the same "F" socket as its predecessor. AMD's next-generation six-core Istanbul processor is also said to use the same Socket 1207 architecture.

AMD announced that its new 75-watt quad-core Shanghai models are available now, while the 55-watt Opteron HE, and 105-watt SE models would come in the first quarter of the next year. Besides, the company also suggested that it plans to make similar upgrades to its desktop line of processors. In early 2009, AMD is expected to launch its 45nm "Dragon"

platform supposed to replace the current "Spider" line which was released in early 2008.

Next year, Intel will show up a Nehalem-based server processor which will compete with Shanghai, yet AMD's chip has some advantages at the moment. The early shift from Barcelona to Shanghai could also be a beneficial one for the chip maker. "We're continuing to move the business forward with a consistency of products," Banda said. "Risk adverse' is the key term we hear from them."

Shanghai has been reportedly making a very good impression on AMD's partners and customers. "Sometimes you really find out about your partner when they're in a corner," said John Lee, vice president for advanced technology solutions at Appro, which has deployed AMD-based supercomputers at national laboratories including the Lawrence Livermore National Laboratory as well as Los Alamos. "I think everyone will agree that Barcelona didn't go as smoothly it should. For us, we had a number of high-profile design wins at about that time; we referred to it as the 'perfect storm'. But AMD stepped up; they were with us every step of the way."