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Systems, Hardware and Electronics

Intel outlines processor road map

Darrell Dunn, InformationWeek , 7-Mar-2006

It's been a tough couple of years for Intel, and the company will lay out a comeback plan this week at the Intel Developers Forum in San Francisco. Intel hopes a better-performing Xeon processor that uses less power will put it on the right path and that a new line of chips that use a "next-generation microarchitecture" will vault it ahead of rival Advanced Micro Devices.

AMD beat Intel to market with key technologies such as 64-bit computing and dual-core processors, and its chips have outperformed Intel's in the increasingly critical performance-per-watt metric. That has let AMD grab market share from much larger Intel, which has had to revise its processor road map and ask its partners to be patient while it gets its technology house in order.

Intel isn't exactly hurting. It posted an impressive \$38.8 billion in revenue last year, and its net income jumped 15% to \$8.7 billion. But the world's largest supplier of microprocessors no longer seems invincible, and it's no longer the only choice for chips to power business computers. "Intel is trailing both in terms of basic performance and performance per watt," says Nathan Brookwood, an analyst with Insight 64. But he expects Intel's advantages to give it a push. "I think by the end of the year, they can be at near parity with AMD."

Humbling Assessment

Near parity? That's a humbling assessment for a company that dominated the PC and server market for many years. But a series of missteps and miscalculations has caused a growing number of business technology managers to seek out systems based on AMD chips. Jeffrey Skolnick, director of the Center for the Study of Systems Biology at the Georgia Institute of Technology, found that servers based on AMD processors were at least 25% more power efficient and provided 20% better performance than equivalent systems based on Intel Xeon processors when he was evaluating systems for an \$8.5 million server cluster. "We were able to create this cluster with about half the servers that would have been required for an Intel-based deployment," Skolnick says.

Brookwood says computer buyers have told him that Intel-based machines aren't on their short list because of power and performance issues. That may change thanks to the new microarchitecture, which will feature a wider and higher performance execution engine, advanced power-control capabilities, a multicore enhanced cache subsystem, and improved memory access. The architecture will provide "great improvement in performance and performance per watt, [and] we believe will have clear-cut leadership in the market," an Intel spokesman says. It will show up in the third quarter in the Woodcrest platform for servers, Conroe for desktop PCs, and Merom for mobile PCs.

Intel's Woodcrest Xeon processors will need to throw off less heat—around 90 watts or less—to make the Xeon platform competitive with AMD's Opteron chips. The highest-performing Opterons have power dissipation of 95 watts, and AMD offers some with less performance at 68 and 55 watts.

Intel this week will add processors to bridge the gap until the new line is available. The company will debut the Dempsey MV generation of Xeon processors, which are expected to throw off only 95 watts of heat and provide 50% greater performance than the current Maxville DP generation, which has 135 watts of power dissipation. Also hitting the market are Sossaman processors, which are based on Intel's 32-bit mobile technology and have power dissipation of only 31 watts.

The heat is clearly on Intel to show that it can improve performance per watt and reduce heat. If it can't, 2006 will be another difficult year.

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