

Intel Strives to Serve Up a Winner

Israeli Team, With New Chip Design, Bids To Wrest Technological Edge From AMD

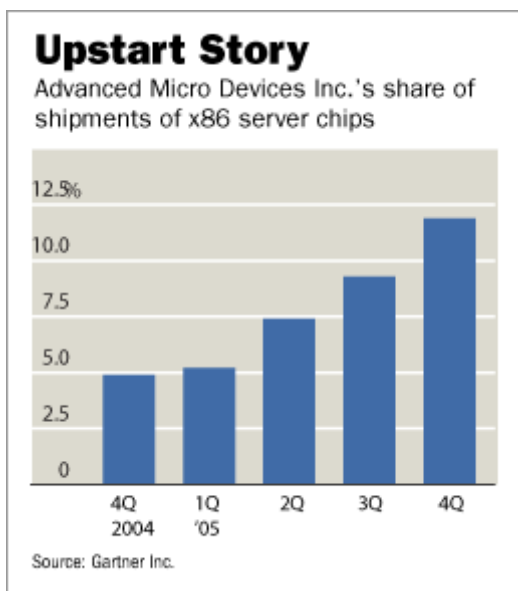
By **DON CLARK**

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In early 2003, a chip from Intel Corp.'s development center in Israel became a hit in laptop computers. Now, the same team faces a bigger challenge: to restore the company's reputation for leadership.

The semiconductor giant is betting that a major design shift, led by engineers in Haifa, can erase a technology edge held by rival Advanced Micro Devices Inc. in chips that serve as the brains in most computers. The new design, a focus of an Intel technical conference that kicks off in San Francisco tomorrow, boosts computing performance and reduces power consumption -- targeting key advantages of chips from the smaller AMD.

Helping to lead Intel's counterattack is Mooly Eden, an Israeli who is vice president and general manager of Intel's mobile-platforms group. Mr. Eden, who has moved to Intel's headquarters in Santa Clara, Calif., vows to grab a 20% performance lead over AMD in the second half of 2006. "We have a product roadmap that we haven't had for the last three years," he says.



The stakes were underscored on Friday, when Intel said its first-quarter revenue will be lower than it had predicted in mid-January. It cited weaker chip demand and a "slight" loss in market share. But some analysts said AMD gains were a significant factor.

Intel's problems are particularly severe in the area of servers, the machines used to run Web sites and perform other corporate chores. AMD, known mainly as a supplier for consumer PCs, in April 2003 introduced a chip called Opteron that was adopted by International Business Machines Corp., Hewlett-Packard Co. and Sun Microsystems Inc.

Besides offering high performance, Opterons draw less power than Intel's Xeon chips -- an important issue for companies with hundreds or even thousands of servers. AMD, based in Sunnyvale, Calif., today is scheduled to introduce three additional Opteron models that it says boost performance by about 10% -- yet still draw a maximum of 95 watts, compared with as much as 145 watts for Intel's fastest Xeons.

By focusing on servers, AMD Chief Executive Hector Ruiz gambled that it could impress companies' most demanding technology buyers, hoping they would also recommend AMD technology for their desktop PCs. The first stage of the strategy appears to be working.

Technology-research firm Gartner Inc. estimates that in the fourth quarter AMD accounted for 11.9% of global unit sales of so-called x86 server chips that both companies sell, up from 4.9% a year earlier. Opteron is particularly popular for models that use four chips, accounting for nearly 32% of such "four-way" servers in the latest quarter.

Intel plans to respond with new server chips based on its existing technology. For a long-term solution, though, the company turned again to Israel.

The design team there, hoping to extend battery life in portable computers, in 2003 developed an energy-efficient microprocessor called Pentium M that became the nucleus of Centrino, Intel's popular bundle of chips for laptops. A Haifa-designed successor called Core Duo, which offers the equivalent of two electronic brains, was selected by Apple Computer Inc. for both desktop and laptop PCs. "As far as the crown jewels of the company, they are it," says one Intel insider of the team in Israel.

The team's next assignment: designing Intel's first common technology for servers, PCs and laptops. The new architecture borrows from earlier chips and adds new tricks, such as carrying out four computing chores at once under some circumstances, Mr. Eden says.

Intel has another advantage -- expertise and financial muscle that help it quickly shrink circuitry, thus improving chip speed and data-storage capacity. The Core Duo, for example, uses a new manufacturing process that creates transistors with dimensions of just 65 nanometers, or billionths of a meter; AMD's 65-nanometer production is expected late this year.

Exploiting the miniaturization, Intel plans to pack processors using the new architecture with circuitry for storing four megabytes of data -- four times as much as the data cache on Opterons. Big caches can speed calculations by reducing the need to go to external chips to fetch data.

Many analysts expect Intel's coming chips based on the new architecture to close the gap with AMD, or even pull ahead. But some observers, such as Thomas Thornhill of UBS Securities, predict AMD will take the lead again.

The reason can be traced to AMD's decision in the late 1990s to build a component called a memory controller onto its chips. Where Intel's processors must pass data through an external controller, AMD's communicate directly -- a big advantage in connecting two or more chips together, or multiple processors on one chip, says Nathan Brookwood, an analyst at the market-research firm Insight 64.

AMD's Mr. Ruiz sounds less worried about Intel's new products than about keeping up with demand for his own. "When we show customers our product plans for the next two years, they are pretty excited," he says. "Our job is to execute."