# Intel faces threat from chip-making upstart

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Even as it reels from the slowdown in personal-computer chip sales, Intel Corp. faces a new and worrisome threat from a growing group of rivals led by a puny upstart.

Anticipating a tectonic shift in the way data is shuttled across computer networks, Applied Micro Circuits Corp. three years ago began developing an energy-saving server chip that targets the needs of Internet-based companies such as Facebook and Google. Now the product is nearing the market, and Intel, which dominates this part of the chip industry, is preparing for battle.

"Applied is a significant threat," said Raymond James analyst Hans Mosesmann. Even though its $195 million in annual sales and 649

employees are dwarfed by Intel's $53 billion and workforce of 105,000, Intel, he said, "will lose market share."

The competition comes at a tough time for Santa Clara, Calif.-based Intel, a storied Silicon Valley company that has led the PC-chip business for decades. Its sales surged for years but have flattened out in recent quarters as consumers shunned PCs for smartphones and tablets.

So Intel isn't going to give up its server-chip business without a fight.

Those chips make up most of Intel's data-center products, which account for 20 percent of its total sales - $10.7 billion last year. That money is even more crucial amid the slowdown in its sales of PC chips, which provide 64 percent of its revenue. Yet analysts say Intel's iron grip on the server market, where it sells 90 percent of the brainy microprocessors, could weaken with the shift to cloud computing.

So to shore up those sales the company just announced a new line of energy-efficient server chips. Although spokesman Radoslaw Walczyk disputed speculation that the new chips are meant as a shot across Applied Micro's bow, he acknowledged, "We're taking every competitor very seriously," and added, "We're not going to make it easy for them." Walczyk said Intel's chips will be superior.

For years, servers - which provide data and other resources to computers on networks - processed huge amounts of information, requiring the powerful chips that are Intel's specialty. But with the cloud model, in which data is accessed from Web-based servers, the machines often do smaller jobs for each customer. That makes it possible to use less powerful chips that also gobble less electricity, a huge plus for server operators.

The cloud-computing trend prompted Sunnyvale, Calif.-based Applied

Micro to make a big business bet that it hopes will result in a major payoff.

Incorporated in 1979, Applied Micro for years made chips for data storage and communications equipment, such as routers and wireless base stations. That business is worth upward of $750 million a year, according to Michael Major, a company vice president. But he said that market wasn't big enough for Paramesh Gopi, who became Applied Micro's CEO in 2009 and who favored "an order-of-magnitude shift" in its business ambitions. So in 2010, Gopi took aim at the cloud-server chip sector, currently worth at least $3 billion a year.

Applied Micro's low-power processors use a design from the British firm ARM. The ARM architecture already is used in the vast majority of smartphones and tablets, where Intel is seeking a foothold, and some analysts believe those chips can also gain traction in servers.

Applied Micro isn't alone. Others developing ARM server chips include Advanced Micro Devices Inc. of Sunnyvale; Santa Clara-based Nvidia Corp.; Cavium Inc. of San Jose, Calif.; and South Korea's Samsung Electronics Co. But some industry experts say Applied Micro's new chip - dubbed X-Gene - has features that should boost its performance over the standard ARM blueprint, making it the most likely immediate threat to Intel.

Some industry experts contend server makers welcome the ARM competitors, hoping they'll force Intel to keep its prices low. Indeed, Mosesmann said he has been told that Hewlett-Packard Co. will include Applied Micro's chip in one of its servers.

The Palo Alto, Calif., leviathan declined to comment on that, and the issue is a touchy one for Intel. The chipmaker doesn't disclose how many server chips it sells to particular companies. But HP is the world's top

server supplier and also Intel's biggest overall chip customer, accounting for 18 percent of Intel's revenue in 2012.

Internet companies that are considered likely customers for ARM servers include Facebook, Google, Netflix, Yahoo and Amazon.com, according to Bernstein Research analysts, who concluded in a recent report that "we see some risks for Intel" when the ARM chips hit the market.

Characterizing the budding server-chip competition as a looming war, Sergis Mushell of research firm Gartner agreed that Intel could be vulnerable. With PC chip sales slowing, he said, it may be so focused on breaking into the mobile-device market, where ARM dominates, that it may not sufficiently heed ARM's threat on the server side.

"If you concentrate your military on one area too much," he said, "you can get flanked on the other."

Still, the Santa Clara giant is a formidable foe, especially for a challenger a fraction its size, according to Linley Gwennap, a chip expert with the Linley Group.

"Intel," he predicted, "is going to be trying to throw every trick in the book at them to get them out of the market."