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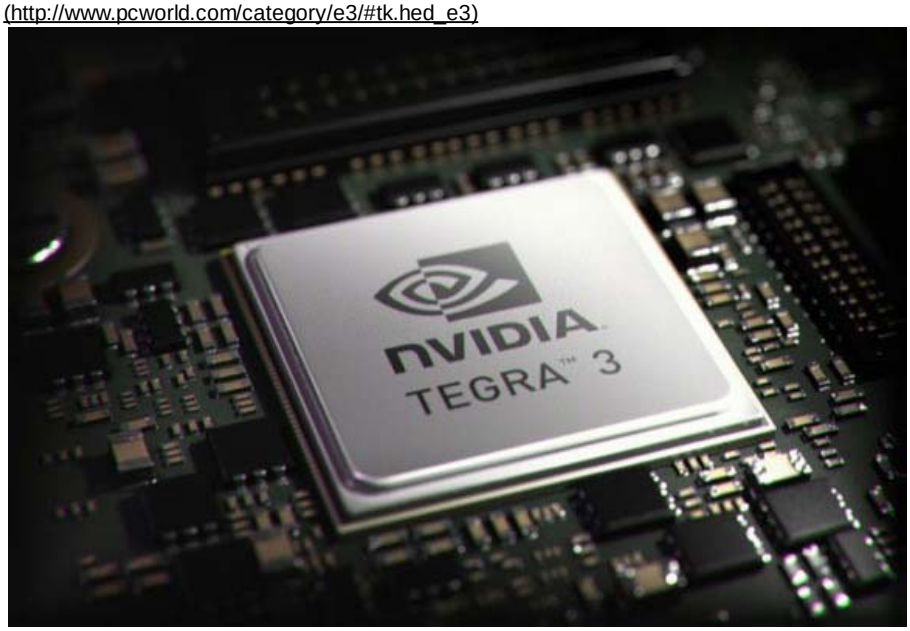

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Smartphone chips to power prototype supercomputer

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Jun 12, 2013 12:13 PM

Smartphone and tablet chips are now making their way into high-performance computers, providing an energy-efficient alternative to the power-hungry server chips used in the world's fastest supercomputers.

The Barcelona Supercomputing Center (BSC) has built a prototype supercomputer running on ARM processors that will be deployed in July, the research center said in a statement Wednesday. The high-performance computer is being announced ahead of the International Supercomputing Conference, which will take place next week in Leipzig, Germany.

ARM processors are used in most of the world's smartphones and tablets, while more than 400 of the fastest supercomputers on the Top500 list are based on x86 server processors from Intel or Advanced Micro Devices. Interest in plugging smartphone processors into servers is growing as companies look to reduce power bills, and ARM processors have been considered for use in servers processing Web-based workloads.

Supercomputing performance is doubling every two years, but power consumption is going up too. BSC has been researching low-power ARM processor use in supercomputers as a way to boost performance while dropping power consumption. BSC recently argued (http://www.pcworld.com/article/2039798/smartphone-chips-could-replace-server-processors-in-hpc-researchers-say.html) that cheaper ARM processors could ultimately overtake the more power hungry and expensive x86 server chips, much like x86 nudged out IBM's Power and other RISC processors in the past.

The BSC supercomputer, called Pedraforca, will have a mix of Nvidia's Tegra 3 chips with the company's Tesla GPUs, which can speed up specific math and science operations. The Tegra 3 chip is based on ARM's 5-year-old Cortex-A9 design, while the graphics technology is similar to the one used in the world's fastest computer called Titan, which mixes 18,688 Tesla GPUs with 299,008 Opteron CPU cores from Advanced Micro Devices.

The server will be deployed at the BSC premises in Barcelona. French server maker Bull and Italian company E4 Computer Engineering will jointly integrate and deploy Pedraforca.

BSC is developing multiple ARM servers, including one using Samsung's Exynos 5 chips, which are based on ARM's latest Cortex-A15 processor design.

Hewlett-Packard and Dell are already offering ARM prototype servers on which customers can test applications. But x86 chips are still considered superior at handling data-intensive applications such as databases, while ARM is largely being considered for hyperscale or distributed computing environments focused on handling search or social media requests.

ARM is also still 32-bit, though the company has announced Cortex-A57, a 64-bit processor design for servers and mobile products. Calxeda, AppliedMicro and other chip makers have announced 64-bit chips based on Cortex-A57 design, and servers are expected to start shipping next year.

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