Alibaba reveals processor based on RISC-V architecture

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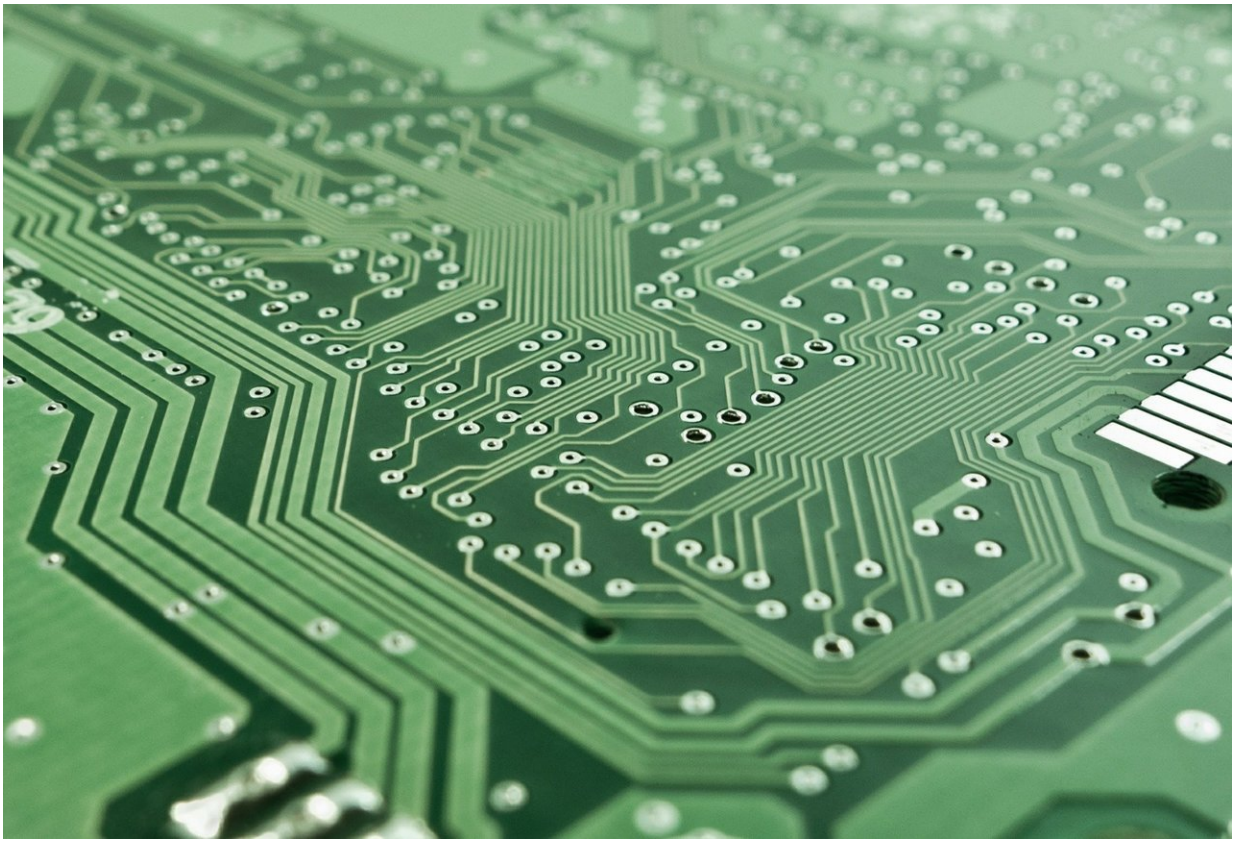

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An Alibaba chip subsidiary Pingtouge has launched a chip processor suited for high performance applications. It's a RISC-V processor.

Nitin Dahad, *EE/Times*: "Pingtouge said its processor achieves 7.1 Coremark/MHz at a frequency of 2.5GHz on a 12nm process node, which is 40 percent more powerful than any RISC-V processor produced to date."

The new chip was made known at the Alibaba Cloud conference in Shanghai. Don't count on any intent to serve simple devices like home appliances. Instead, taller ambitions are for IoT areas that require high-performance computing such as 5G, AI, networking, gateway, self-driving automobile, and edge server, said reports.

RISC-V is an open source chip architecture. RISC stands for reduced instruction set computer. It is an open-source hardware instruction set architecture (ISA) based on RISC principles.

This open-source ISA is at the heart of the processor and it is backed by Google, Nvidia, Western Digital, Qualcomm, Alibaba, and others, said Katyanna Quach in *The Register*.

Stewart Randall in *TechNode* said "The RISC-V Foundation, which promotes the ISA's use, features leading global players including Microchip, Western Digital, Google, Nvidia, and Qualcomm, to name just a few. Through collaborative and independent projects, several members are working to create RISC-V based designs."

That carries advantages in the wake of recent general news over trade sanctions. Quach pointed to the architecture family's openly available materials, saying that the ISA documentation, CPU cores, and software stacks were "already out there over the internet, and it's too late to cut that knowledge off."

South China Morning Post made a similar note that RISC-V was a globally-recognized open-source standard, and not affected by trade

restrictions.

Reuters quoted Stewart Randall, who tracks China's semiconductor industry at Shanghai-based consultancy Intralink. "There's no threat ever of them losing access to a key part of this design."

RISC-V carries an instruction-set architecture; according to the *EE/Times* report, the company said it added 50 extended instructions to enhance various arithmetic operations, memory access and multicore capabilities.

Also, *The Register*'s report talked about "its ability to perform out-of-order execution, a technique used by modern processors to jam their foot on the gas and run software much faster than if they were working in-order."

The bigger picture to this, meanwhile, is indeed a bigger picture if one considers *South China Morning Post*'s article by Zen Soo. Fundamentally, one can take this news to indicate that China is looking to bolster self reliance on semiconductors.

Reuters made the similar observation. "The release also comes as China's government urges the domestic tech industry to boost its prowess in the chip sector, which lags behind that of the United States and Japan."

(*SCMP*: China was still heavily reliant on the US for semiconductors, with a significant part of market demand met by imports. By next year it was only expected to reach a self-sufficiency rate of 15 percent.)

The Hangzhou-headquartered Alibaba is now part of a group of Chinese tech companies," said *SCMP*, "including Huawei and AI upstart Horizon Robotics, that are dedicating resources to develop their own AI chips."

"Now you can design custom circuitry and accelerators, add some RISC-V cores to execute application and management code, test and fabricate it, and voila: you've got your own chip on the cheap," said *The Register*.

A number of reports, after all, are calling attention to the new launch as being its "first self-developed" chip processor, Alibaba's RISC-V processor design, Xuantie 910, has taken center-stage.

Zen Soo provided some details about the subsidiary, "set up last year as part of the company's efforts to develop chips for the burgeoning Internet of Things industry and artificial intelligence applications"—and all this following Alibaba's acquisition of Chinese chip maker C-Sky Microsystems.

The e-commerce giant has steadily expanded from online shopping and into more technology-intensive areas. It is now China's biggest provider of cloud computing services, said Reuters.

"It is important to note that whilst RISC-V is open-source, any serious product is probably going to want to license a commercial RISC-V core," said Randall in *TechNode*. "Alternatively, companies with the resources and expertise can design their own. Often people may misunderstand RISC-V to be free. It isn't but it is cheaper. Some commercial core suppliers do not ask for royalties, and license fees can be low, especially as these suppliers try to gain market share."

Randall added that "This year I expect to see several Chinese companies taping out RISC-V based IoT chips as well as AI chips which include the ISA's cores somewhere in the design."

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