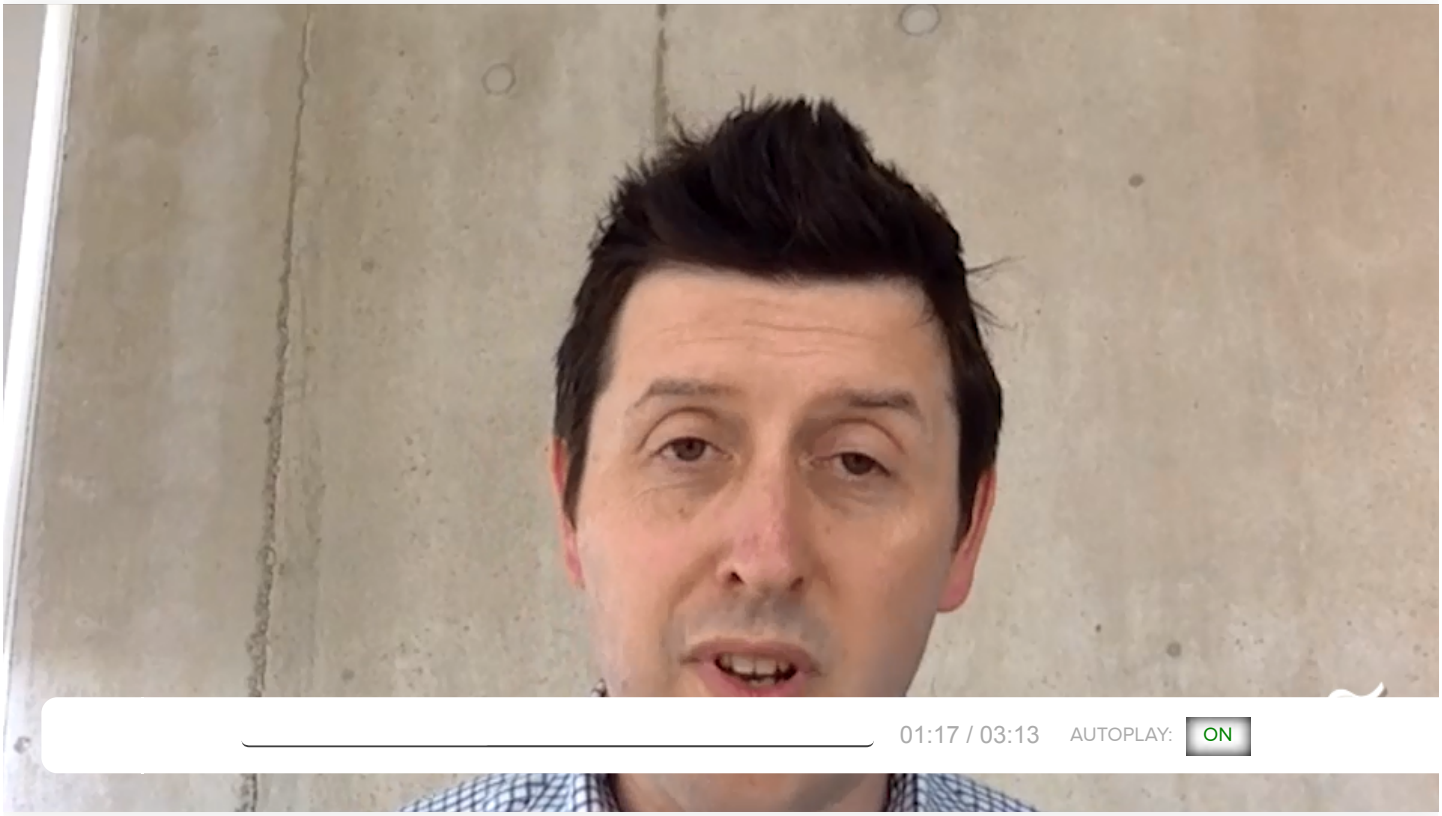
DATA CENTERS

Cavium's ThunderX2 is an ARM chip for servers that could be a good fit for HPC

Cavium is launching a new ARM SoC for servers as other vendors are looking to get out of the ARM server market.

By James Sanders | May 9, 2018, 6:23 AM PST



Chip maker Cavium recently announced the general availability of the ThunderX2 line of ARM-based SoCs (https://cavium.com/product-thunderx2-arm-processors.html) intended for use in servers. The ThunderX2 is a 64-bit, ARMv8 CPU available in a variety of differing SKUs, from 16-core/1.6 GHz to 32-core/2.5 GHz, with eight DDR4 controllers for 16 DIMMs per socket, allowing for up to 4 TB of RAM in a dual-socket setup.

Some OEMs are already shipping products utilizing the ThunderX2. Most notably, HPE's Apollo 70 system (https://www.hpe.com/us/en/product-catalog/servers/proliant-servers/pip.hpe-apollo-70-system.1010742472.html) is targeted toward memory-intensive HPC workloads. The relative power efficiency of ARM makes it well suited for cluster computing deployments.

Accordingly, the Apollo 70 is quite dense, as the company notes on the product page (https://www.hpe.com/us/en/product-

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How to save energy in your data center (https://www.techrepublic.com/article to-save-energy-in-your-data-center/)

Photos: The 20 greenest data centers in the world (https://www.techrepublic.com/pictur the-20-greenest-data-centers-in-the-world/)

catalog/servers/proliant-servers/pip.hpe-apollo-70-system.1010742472.html) that the "'4 in 2U' chassis system architecture... supports up to 4 dual socket servers in a 2U chassis and enables up to 80 nodes, allowing over 5,000 Arm cores in a 42U rack." Similarly, in the United Kingdom, Avantek sells a similar server design, which they brand as a 2U4N setup (https://www.avantek.co.uk/avantek-arm-server-thunderx2/), which can support four dual-socket ThunderX2 nodes. The company also offers more conventional ThunderX2 server in 1U and 2U configurations.

How your company can avoid an IT nightmare like the IRS outage on Tax Day (https://www.techrepublic.com/article/your-company-can-avoid-an-it-nightmare-like-the-irs-outage-on-tax-day/)

Why Docker could upend VMware's business model and what it means for your data center (https://www.techrepublic.com/article/docker-could-upend-vmwares-business-model-and-what-it-means-for-your-data-center/)

Gigabyte and Phoenics Electronics are also selling a ThunderX2-powered workstation, appropriately named the ThunderXStation (https://www.zdnet.com/article/caviums-thunderx2-processor-powers-first-64-bit-armv8-workstation/). The system is built around a 4U tower format, and is available with a 32-core/2.2 GHz SoC, either as a single or dual processor configuration.

The ThunderX2 is also being used to power the Mont-Blanc Supercomputer (http://montblanc-project.eu) project.

SEE: IT leader's guide to edge computing (http://www.techproresearch.com/downloads/it-leader-s-guide-to-edge-computing/) (Tech Pro Research)

For roughly a decade, x86-64 has held hegemony over the desktop and server market, with Intel's Xeon line of processors powering upward of 90% of the market. For mobile devices, ARM is the popular platform—for which a glut of cheap ARM processors have led to the rise of mass-produced single-board computers (SBCs) like the Raspberry Pi and competitors. Adapting ARM technology for server use requires a great deal of industry-wide cooperation—direct porting of software is one thing, though actively optimizing for other architectures is very much a prerequisite to giving a real value proposition to breaking out of the x86-64 bubble.

There are relatively few organizations actually producing ARM-powered hardware for servers. Cavium started work on the original line of ThunderX processors back in 2012 (https://www.zdnet.com/article/project-thunder-looks-to-introduce-64-bit-arm-servers-on-a-chip/), though the ThunderX2 is only nominally the successor to the original design. It was originally developed at Broadcom as "Vulcan," though the project was axed after Broadcom was acquired by Avago, after which Cavium acquired the IP.

A December 2016 report (https://www.theregister.co.uk/2016/12/07/broadcom_arm_processor_vulcan/) from The Register indicates that Macom—the new owner of Applied Micro—is looking to sell off their

X-Gene ARM server operation as well. To add to those problems, Bloomberg reported (https://www.bloomberg.com/news/articles/2018-05-07/qualcomm-is-said-to-plan-exit-from-server-chips-amid-cost-cuts) this week that Qualcomm is presently evaluating whether to sell off its Centriq division, which manufactures ARM SoCs for servers. Support for Qualcomm's offering has been rather high, as Microsoft ported Windows Server to ARM (https://www.zdnet.com/article/windows-server-on-arm-its-happening/), and CloudFlare has voiced a great deal of enthusiasm (https://blog.cloudflare.com/arm-takes-wing/) for the platform.

> The big takeaways for tech leaders:

- *Cavium has announced general availability of the ThunderX2 ARMv8-powered server CPU.*
- *Other vendors offering ARM CPUs for servers are looking to exit the market.*

Also see

- Special report: The future of Everything as a Service (free PDF) (https://www.zdnet.com/article/free-pdf-download-the-future-of-everything-as-a-service/) (TechRepublic)
- Ampere, led by band of former Intel execs, aims to push ARM into data center (https://www.zdnet.com/article/ampere-led-by-band-of-former-intel-execs-aims-to-push-arm-into-data-center/) (ZDNet)
- The Machine by Hewlett Packard Enterprise: The smart person's guide (https://www.techrepublic.com/article/the-machine-by-hewlett-packard-enterprise-the-smart-persons-guide/) (TechRepublic)
- Arm launches Cortex-M35P processor to bring IoT security to the silicon level (https://www.zdnet.com/article/arm-launches-cortex-m35p-processor-to-bring-security-to-silicon/) (ZDNet)
- Most powerful Raspberry Pi-style boards yet? Octa-core machines with dual-SATA, PCIe, USB 3.0 and 4K video (https://www.techrepublic.com/article/most-powerful-raspberry-pi-style-board-yet-octa-core-boards-with-8gb-and-dual-sata-revealed/) (TechRepublic)