U.K. Entrepreneur delivers more Server computations using up to 90 percent less electricity

> " One of the requirements to building a reliable server is to ensure that each of the components that we install into it are themselves reliable. We have found Kingston's DRAMs and SSDs to be very reliable and solid performers. And that's been a key to earning and protecting our reputation for quality, low-power profile systems. "

Tony Lees
Managing Director,
Avantek Computer Limited

Business challenge

Avantek Computer Limited (Avantek) shows that delivering more for less can be achieved. The Leicestershire, U.K. company is leveraging emerging- and state-of-the-art technologies to bend the performance and power curve in favor of datacenters. From its founding in 1998, the company has grown to become a player in the university computing marketplace and beyond. The flagship product fueling this growth is Avantek's low-energy profile, high-performance, highly-scalable ARM-processor servers.

The Avantek solution comes at a time when datacenter operators are keen to cut their energy use. Collectively, datacenters consume about 30 billion watts of electricity per year[1]. That reality, leads Peter Gross, former HP Technology Consulting Managing Partner to call it "staggering," going on to say "A single datacenter can take more power than a medium-sized town."[2]

Most server owners don't operate at that scale. Still, even for server clusters the energy bill to run production servers 24x7x365 adds up like this:

SUMMARY

Kingston-equipped (SSDs, DRAM) ARM servers draw up to 90 percent less electricity and 50 percent less cooling.

- **Lowers server TCO.**

- **Supports customer green initiatives.**

Reliability of SSD and DRAM solutions contributes to server uptime.

- **Meets customer availability requirements for production environment servers.**

- **Avantek servers have been "rock solid" in performance in university production environments — from 20,000-user e-mail systems to human genome research projects."**

Annual Server Energy Bill = (total # of servers) x (average kilowatt/hr. draw per server) x (8,760 hours/year). At $0.11 per kilowatt hour, that could tally over $1,000 per year per server.[3,4]

"We set out to create server solutions that are disruptive to traditional notions of energy consumption," explains Tony Lees, Managing Director of Avantek Computer Limited in Tur Langton, Leicestershire, U.K. "And we've done just that by architecting servers that significantly drive up the processing-to-power-use ratio for our customers."

To achieve that end, Lees took a comprehensive approach to designing his products.

Technology solution

Lees based the Avantek ARM server on Calxeda's quad-core 32-bit ECX-1000 ARM processor. "That gives it powerful processing capabilities along with a low power profile. Plus, it's scalable, up to 4096 nodes."

It's no coincidence that Avantek's solutions offer these specifications. Servers that push the performance-per-watt envelope are a subject of intense interest in the U.K. right now. "The problem the British government has made a big fuss about, is that the U.K. is running out of electricity," says Lees. "There are even stories that we may have blackouts this winter."

In light of this, it's little wonder that energy-efficient technologies are top of mind among U.K. IT professionals. And that's one reason why Avantek's 3U ARM server—sipping a teacup five watts per node—has gained a foothold with customers.

"In order to deliver a low-power server you have to use energy-conserving components," explains Lees. "We standardized on SSDs because they use a lot less power than spinning disks. And we use low-power DRAM and high-efficiency power supplies as well."

Lees' design answered the "what-components-to-use" question. To solve the "whose-components-to-use" problem, his team relied upon past experience and real-world testing.

"We ran stringent benchmark tests on SSDs and DRAMs from a number of suppliers," recalls Lees. "And we found the Kingston solutions to be performers."

That's consistent with benchmark test results from a third party, which placed Kingston first (least power used) among a field of eight SSD contestants.[5]

Still, excellent performance without enterprise-class reliability would not help Avantek sell production environment systems. "To field an unreliable server, based on cheap components, would irreparably harm our reputation and our business," says Lees. "So in addition to Kingston SSDs, we also chose to use their DRAM. It's been extremely reliable over the years we've used them. And we felt that past experience was a good predictor of future performance and it has proven to be so."

Today, a 48-node Avantek 3U Arm server cluster comes equipped with 192 Cores, up to 48 Kingston SSDs and 192GB of Kingston DRAM. All together, the energy-conserving server configuration draws a bit less than 240 watts of power.

Business results

The Kingston-equipped Avantek ARM servers have delivered a number of benefits to the company's customers.

Significantly increases server processing-to-power-use ratio

The Avantek conservation-optimized servers give datacenter executives a viable option to dramatically reduce their cluster-computing electricity costs.

"One of the greatest advantages of our ARM server solutions is that they consume up to 90 percent less power to run them than an equivalent server from another supplier," says Lees. "And because less power is required to drive them, our customers can also save up to 50 percent of the power they use to cool legacy servers."

The company's lab tests have translated to customer production environments.

"One of our customers is using our systems to run complex human genome computations," says Lees. "They tell us that they've seen massive performance-per-watt improvements in the comparative tests they've run against legacy systems."

Allows space- and power-limited facilities to add more computing

Some of Avantek's customers have maxed out their server capacity. "One of our largest university customers can't import any more electricity because they are housed in listed buildings ," recalls Lees. "So the only way they can add more computing power is to replace older systems with our energy-conscious ARM servers."

This solution approach has the added benefit of lowering the load upon existing cooling systems as well, to liberate more power to be applied elsewhere in the data center.

Performance and reliability earns customers

By utilizing Kingston SSDs and DRAMs with high MTBF ratings, Avantek servers have earned a reputation for reliability.

"Our university customers use our servers to run everything from a 20,000-user e-mail system to complex human genome project computations," explains Lees. "And their track record has been rock solid."

To find out how DRAMs and SSDs from Kingston Technology can help your organization, visit **kingston.com**

1 Glanz, James, "Power, Pollution and the Internet," The New York Times, September 22, 2012.
2 Ibid.
3 While I'm using dollars here, we'll have to decide whether to use British Pounds or Euros in the final version.
4 Example paraphrased from: Neudorfer, Julius, contributor, "Trends in data center power usage," techtarget.com, October 2011.
5 Ku, Andrew, "Best SSDs For The Money: For Reference, SSD Versus HDD: Power And Performance," tomshardware.com. July 29, 2012.
6 In the UK, a building that has been placed on the nation's Statutory List of Buildings of Special Architectural or Historic Interest. See: https://en.wikipedia.org/wiki/Listed_building.

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