

Boston Viridis

Bored of x86 and fancy a change? **Ben Everard** takes a look at a new server that's causing a bit of a stir.

In brief...

» An ARM server built to run high-performance applications with a low power draw.

The Raspberry Pi isn't the only ARM-based computer to be upsetting the status quo. At the other end of the scale, another British firm is packing ARM processors into rack-mounted servers.

If your only experience with RISC chips is in your phone, then you may wonder why on earth you'd want them in a server. Don't be mistaken; they may share an instruction set with the phone chips, but that's about all. The server's Calxeda EnergyCore System on a Chips (SoCs) are 18-wheeler lorries to the phone chip's Vespa scooters.

Energy efficient

As you may have guessed from the name, they're trumpeting their power efficiency. At full load, these SoCs use just 5 Watts of power. Despite being the heavyweights of the ARM world, the individual chips aren't as quick as their x86 cousins. The performance of the Viridis comes from the number of chips they pack into each box rather than the speed of each one. In a single 2U enclosure, they can fit up to 48 nodes – that's 196 cores. Their manufacturer claims that they can perform like-for-like computations using a tenth of the power of x86 servers.

When it comes to server speeds, manufacturers' claims should always be sprinkled liberally with salt. That's not to say that you can't get these sorts of power savings – you can – but they're not guaranteed. It depends on what you want to run. For example, the chips are 32-bit, which will affect some processes more than others. The SoCs implement ARM's hard float version, but even this struggles when compared with x86 floating point performance.

Tasks can be managed across the different nodes (chips) using **mpirun**. This means that any software you want to run on the server needs to have support for MPI (Message Passing Interface), or it will be restricted to running on a per-node basis. In a sense, the Viridis isn't a server, but a cluster in a box. The SoCs have been designed with this style of processing in mind, and each chip has a network switch on the same silicon as the processing



» Each card carries four EnergyCore SoCs. This enclosure is fully populated.

cores to ensure top-notch speeds between nodes. The result of this is that it's not always easy to tell which tasks will run well on the Viridis. Fortunately, the folks at Boston are keen to help you find out. If you've got a project that you think could benefit from this platform, email them at hpc@boston.co.uk to discuss your requirements, and request time on their test server.

If you're running easily parallelisable 32-bit tasks with few floating-point operations, the Viridis is worth investigating – the cost and power savings can be significant. If not, it's still something to keep your eye on. It's young technology, and all young technology has potential to improve.

Distro choice

On the software side of things, Viridis runs either Ubuntu or Fedora, and so you get the full depth of their repositories compiled for ARM and ready to run. Support for Red Hat (and therefore the various clones) is likely in the future, but not yet confirmed.

Another potential, but as yet unconfirmed, improvement is support for 64-bit ARM when they are released. What we at **LXF** find exciting isn't the Viridis itself, though it is a capable server, but what it represents. For the past two decades, we've been slaves to the x86 architecture and its particular

performance characteristics. Now you can pick the hardware that's right for your tasks and, thanks to free software, have a full selection of programs ready to use. For some people the right platform will still be a traditional x86 machine, but for others it won't be. This new choice of server architecture is shaking things up that have been stable for a long time.

Hopefully, this change will benefit everyone in the server world regardless of the instruction set they use. The fact that the revolution's being lead by a British-built machine, based on a British architecture and running a British distro is just the red, white and blue icing on the cake. **LXF**

LINUX Verdict

Viridis

Developer: Boston
Web: www.boston.co.uk/solutions
Price: Starting at 10,000 USD

Features	9/10
Performance	10/10
Ease of use	9/10
Documentation	8/10

» For the right applications, Viridis offers significant power advantages over x86.

Rating 9/10