



# High Performance Computing

**VIRTUS**  
Data Centres



# High Performance Computing

Technology advances like the Internet of Things (IoT) and Big Data have brought about a revolution within the IT world and beyond. From smart devices and connected communities, to digital businesses managing connections, devices and workflows, the applications are diverse and ground breaking. What's more, because all things digital generate massive amounts of data, their impact is being felt all the way along the technology supply chain, causing many data centre managers to turn towards High Performance Computing (HPC), to help cope with this influx of data.

## The benefits and challenges of **HPC**

**HPC aggregates computing power to deliver a much higher performance than standalone systems can provide. Once seen as the reserve of the mega corporation, the benefits are now acknowledged as wide-ranging - helping to maximise productivity and efficiency, increase available power density and the physical footprint computing power of the data centre.**

HPC requires data centres to adopt High Density and Ultra High Density innovation strategies. However, not all facilities have the capability. Even data centres that were built as recently as a few years ago were only designed to have a uniform energy distribution of around two to four kilowatts (kW) per IT rack - far below the 15kW per rack which Gartner recently defined as "High Density capability". And, this 15kW figure is being revised upwards all the time - with some HPC platforms now requiring performance way in excess of this - sometimes referred to as Ultra High Density.

Providers that are working to upgrade legacy data centres for Ultra High Density are facing a tricky task - although the concept is straightforward, it involves a lot more than simply main-lining more electricity into the building. It's essential that before a data centre can support this requirement that it has a robust and fit-for-purpose infrastructure in place. High Performance Compute not only requires increased quantities of power per cabinet, but also next generation cooling capabilities, which are extremely difficult to retrofit.





# Choosing **the right partner**

Only data centres that have been built from the ground up with HPC in mind will be able to operate cost-effectively. If HPC has been designed “in” from the beginning, it provides the ability to support the next generation of businesses IT infrastructure - optimising the data centre footprint required and the overall associated costs.

On-ramping to the cloud is another key consideration when picking the right provider - the most effective data centre providers make it easy to connect public and private clouds to deliver HPC.

For example, at VIRTUS Data Centres, we provide on-ramp to cloud services, so customers have direct access to multiple clouds that can provide complementary compute and storage solutions necessary to maximise the HPC

output. We’ve also made the investment of fully diverse multi sub-duct networks providing near-infinite bandwidth for the huge volumes of data that are absorbed and generated by these HPC solutions.

But the technology alone is not enough. To manage HPC environments, you need a High Performance team; people who have been there, seen it and done it. At VIRTUS we are proud to support the Joint Information Systems Committee (JISC) Framework, which comprises of more than 20 of the UK’s largest universities and research institutions. JISC entrusts us with a range of HPC solutions from different manufacturers and some of the most powerful high performance super compute solutions in the UK.

Low latency is often another major

factor so data centre location becomes increasingly important. Being near the main fibre routes that support the UK and global telecoms carriers that transit from US to Europe via the M4 corridor is essential and gives easy access to cross connect to a multitude of public clouds. Other important considerations are reliability, scalability and uninterrupted service.

## What does **success** look like?

**Having looked at the benefits of HPC and how to choose the right provider, the University of Bristol provides a good example of how it can make a real difference to operations.**

For over a decade the University of Bristol has been contributing to world-leading and life changing scientific research using HPC, having invested over £16 million in research data storage. Working with OCF, Lenovo, DDN and IBM, VIRTUS helped supply a new supercomputer named BlueCrystal 4 (BC4).

The Blue Crystal supercomputer facility played a pivotal part in a €1.8 million study into Ebola, looking at the speed of virus evolution, and the corresponding effect on vaccines, diagnostics and treatment. BlueCrystal 4 allowed the team to examine how the virus evolved over the previous year, informing public health policy in key areas such as diagnostic testing, vaccine deployment and experimental treatment options - vital in helping the EU’s fight against the disease. But, of course, none of this success would have been possible without the underlying infrastructure - the data centre which processes, stores and analyses the vast amounts of data required to make it run.

Thanks to the large-scale IT infrastructure investments made by colocation and cloud providers, HPC is now more accessible than ever. But, to get it right, organisations must choose their provider wisely, looking for a partner who has the setup in place to truly help deliver on their HPC vision now and in the future.





## About VIRTUS

VIRTUS owns, designs, builds and operates a new generation of agile, connected, efficient data centres around the heart of London's cloud and digital content economy. Located within London's metro, VIRTUS offers the best of traditional retail colocation including limitless connectivity, dedicated support and complementary ecosystems, combined with the low cost, scalability and custom solutions of the wholesale model, in uniquely flexible and customer friendly packages.



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