Addressing the need for
Ultra High Density

VIRTUS
Data Centres

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Over the last few years, static or reducing IT budgets have meant CIOs have been under pressure from businesses and end users to squeeze every ounce of productivity from their IT assets.

Everything has a knock-on effect, and in response, CIOs have placed increasing pressure on IT infrastructure and service providers to help fulfil these mounting business requirements.

The impact of these demands have been felt across the entire technological supply chain – meaning that the data centre now sits firmly at the heart of the business. Getting the data centre strategy right means that the company has an intelligent and scalable asset that enables choice and growth. Get it wrong and it becomes a fundamental constraint for innovation.

Therefore, as end-user demands increase, this forces the hand of data centres to evolve and keep pace with the changing business requirements being asked of them.

Historically, for a data centre to 'meet new needs', it would simply add floor space to accommodate more racks and servers. However, the demands for increased IT resources and productivity have also come hand in hand with increased need for higher efficiencies, better cost savings and lower environmental impact. Third party colocation data centres have increasingly been looked at as the way to support this growth and innovation, rather than CIOs expending capital to build and run their own on-premise capability.

High Performance Computing, once seen as the reserve of the mega-corporation, is now being looked at as a way to redress this IT budget/performance dichotomy and is requiring data centres to adopt High Density innovation strategies in order to maximise productivity and efficiency, increase available power density and the 'per foot' computing power of the data centre.

The Industry View of
Ultra High Density
in the Data Centre

Industry views around High Density vary widely. For example, data centres built as recently as a few years ago were designed to have a uniform energy distribution of around 2 to 4 kilowatts (kW) per IT rack. Some even added 'high density zones' capable of scaling up if required, but many of these required additional footprint to be provided around the higher power racks to balance cooling capability, or supplemental cooling equipment that raised the cost of supporting the kW density increase.

There are still many differing perceptions around what a High Density zone might mean in terms of capability and cost to the end user. Moore's law states that computer processing power doubles every year, which theoretically means that the capabilities of data centres year on year could vary quite significantly dependent on when they were built.

Gartner recently defined a high density capability as one where the energy needed is more than 15kW per rack for a given set of rows, but this is being revised upwards all the time with some High Performance Computing platforms now requiring performance in the 30-40kW per range - sometimes referred to as Ultra High Density.

Who Can Support **High Performance Computing** and why is it Important?

Being able to support High Performance Computing in the data centre, using High Density innovation, has become the next battle ground for colocation providers and this goes some way to explaining the differing views around what High Density actually is – and how to support it. Some will have higher density capabilities than others – though few providers will admit it.

High Density capability will be extremely important for businesses deciding which third party data centre to use in the future. If High Density has been designed 'in' from the beginning, it provides the ability to support the next generation of businesses IT infrastructure for High Performance Computing thus optimising the data centre footprint required and the overall associated costs.

This means that irrespective of whether existing data centres take steps to offer High Density, they are playing catch-up with a next generation of intelligent data centres that already have this capability.

As a result, data centres over three years old will come under increasing pressure to align to new, more powerful technologies being installed in the data centres, and remain competitive in the marketplace.

Upgrading Legacy Data Centres for **Ultra High Density**

Existing data centres that do take steps to offer High Density and accommodate the installation and running of High Performance Computing will have to upgrade their facilities in most cases. This however, is easier said than done.

Although the concept of High Density is straight forward, 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, it has a robust and fit-for-purpose infrastructure in place.

High Density not only requires increased quantities of power per cabinet, but also next generation cooling capabilities, which are extremely difficult to retrofit.

Advanced cooling is essential as more energy consumption and harder working servers naturally equate to more heat. Given data centres have very strict operating parameters when it comes to temperature, this means that a data centre needs not only to be able to cope with the extra power being piped into the building but also the extra heat being pumped out.

The ability to cool the equipment therefore is critical to the operational integrity and performance of any high density computing data centre.

Consequently, many traditional data centres struggle to provide High Densities within the Racks – even at a medium density – without a supplementary cooling and support infrastructure or a compromise to the original data centre design, which would be extremely costly and negate the customer cost benefits of High Performance Computing.

VIRTUS Intelligent **Ultra High Density** Computing Data Centres

VIRTUS Data Centres have been intelligently designed and purpose built from the ground up to ensure they are highly optimised, deliver innovative services, and are sustainable and efficient.

They are uniquely designed and built for the highest density deployments, enabling customers to easily have high density (10kW-20kW) to ultra-high density (20kW-40kW) in a rack, without the need for any additional power or cooling infrastructure.

This is made possible by VIRTUS' innovative modular design of the data centre, using an indirect air technology, delivering cooling via an air flooded room principle that is unique in the London market place. This allows for each rack to operate at varying densities and be placed anywhere in the data hall – negating the requirement for special areas or zones that are the only place high densities can be supported.

Being developed with high and ultra-high densities from an early stage of planning, VIRTUS can provide customers with a financial advantage, as the data centre is built to operate at high density without any supplementary support technology, and therefore a customer utilising High Performance Computing benefits from the cost per kW reducing as the power density in a rack is increased. So the denser the computing power can be stacked in a rack, the more cost-effective the data centre space can be offered to the customer, making a High Performance Computing deployment significantly more cost-effective.

VIRTUS Data Centres have taken this approach with the building of the LONDON2 data centre in Hayes, which opened in September 2014. The first of its kind, it has been designed from the ground up to be an intelligent and highly efficient data centre, which has been recognised and awarded with Tier III certification by the Uptime Institute. In addition, its freehold status – as a data centre built on ground owned by VIRTUS – is a key contributor to the low cost of ownership enjoyed by VIRTUS and customers.

Make the **Right Choice**

VIRTUS understands that making the right choice is not simply about the data centre, it is also about making the right High Performance Computing platform choice.

The VIRTUS LONDON2 data centre high density capability has been verified by many of the leading IT hardware providers as the location of choice for their next generation of High Performance servers, storage and networking equipment, enabling them to push innovation beyond the constraints of traditional data centres and move High Performance Computing within easy reach of the average business.

If you're interested in learning more about VIRTUS' Intelligent LONDON2 Data Centre in Hayes contact:
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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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