

The Demand on Data Centers in the Time of Coronavirus

#KingstonCognate introduces Prof. Sally Eaves



Prof. Sally Eaves is a highly experienced Chief Technology Officer, Professor in Advanced Technologies and a Global Strategic Advisor on Digital Transformation specialising in the application of emergent technologies, notably AI, FinTech, Blockchain & 5G disciplines, for business transformation and social impact at scale. An international Keynote Speaker and Author, Sally was an inaugural recipient of the Frontier Technology and Social Impact award, presented at the United Nations in 2018 and has been described as the 'torchbearer for ethical tech' founding Aspirational Futures to enhance inclusion, diversity and belonging in the technology space and beyond.



Data is now an essential utility during "stay at home"

In this unprecedented period of global uncertainty, ways of working, learning and living have changed with both speed and scale. Being prepared for the unexpected is in the DNA of the data center industry whose 'invisible' operations have now been classed within the definition of 'essential services' in most countries around the globe. Effecting organizations of all sizes, in every industry, Coronavirus has impacted business continuity across entire economies. To negate the change and challenges, optimising extant services whilst accommodating new demands become a data center strategic and operational imperative. There are two key drivers catalysing the massive increase in demand. Firstly, is the need for computing capacity, driven by the large scale move to working from home for many businesses and institutions. Digital infrastructure has never been so important to the world economy. The associated uptake in usage of digital applications in video calling, telehealth, e-commerce and e-learning, alongside those for entertainment as we all spend more time indoors, is causing a surge in need for data capacities.

The new demand on data center throughput is breaking new records

The recent Kingston [publication](#)¹ on data center growth highlighted our 'insatiable' need for data, ever more enabled by the emergence of 5G, IoT and Edge Computing. Putting this into a Coronavirus context, on the 11th March 2020, data center services provider Deutsche Commercial Internet Exchange set a new world record² in Frankfurt – achieving data throughput at over 9.1 Terabits per second. Vodafone has reported a 50% increase in data traffic³ in some markets with significant usage spikes across Internet Service Providers. Indeed, BT has removed home broadband data limits⁴ to support work, study and living needs. But whilst monitoring of our 'internet health' does reflect an upward trend in outages⁵ this has not been to a level that corresponds with the unprecedented traffic increases experienced. And further, despite the current rise and the future projected year on year increase in data center traffic and workloads, it is important to note that global data center energy demand is forecast to decrease as monitored by the International Energy Agency - IEA⁶. This is due to both consolidation and efficiency practices especially cooling systems, and with some new hyperscale data centers to be run on 100% percent renewable energy.



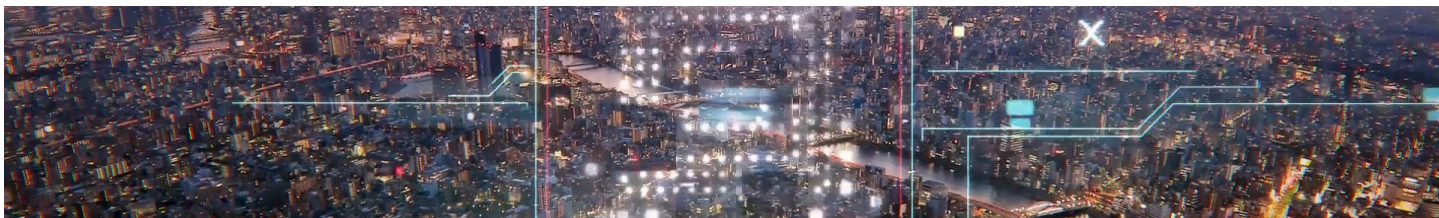
High Performance Computing powers research to help fight the virus

The second core driver is the need for speed and computing power, and this is where HPC (High Performance Computing) comes in. Vaccine and treatment research generate large data sets. Research institutions and pharmaceutical companies are utilising HPC systems at scale for the first time to undertake data simulations and calculations in areas such as epidemiology and bioinformatics. This can help dramatically reduce the development timescale for new drugs.

The Coronavirus High-Performance Computing Consortium⁷ is bringing together leaders in technology, government and academia and making available over 330 petaflops of computing speed, 775,000 central processing unit cores, and 34,000 graphics processing units. In the endeavour to better understand the virus and form treatments that can be used for potential vaccines, an incredible 330 trillion floating-point operations can now be performed per second. This is also a great example of prioritizing collaboration above competition

with contributors including IBM, Amazon, Microsoft, HPE and Google.

Whilst often hidden in plain sight, data centers are both the 'power houses' of cloud computing and the connectors of the internet, delivering on the tripartite need for more speed, more flexibility and optimal availability. Operators have worked quickly to build resilience to negate the risk of downtime and service interruption to their different user groups. With Gartner estimating the average cost of IT downtime at some \$5,600 per minute, it is no wonder that this is a leading information technology concern for IT management. In the same way retail consumers have sought to hoard food and household items, as epitomized by toilet roll stockpiling⁸ observed worldwide, so data center customers have been looking to secure supplemental capacity and bandwidth to both meet the current rapidly expanding needs and as protection for business continuity too.



I Managing "virtual" virtually

Transparency has been critical to both reassure and foster trust, with data center operators publicly sharing the criteria in place to manage, and if need be, prioritise new cloud services capacity to safeguard critical operations⁹. There has also been significant support for existing customers, with most providers introducing short term measures such as suspension of bandwidth over usage costs. For many SME clients, where demands on network traffic and throughput have occurred that were neither expected nor planned for, the ability to increase system loads and networks beyond any extant CDR and up to the maximum throughput of their ports without penalty, can make the difference in ensuring their business viability over this tumultuous time.

But enabling business continuity for customers and partners also necessitates ensuring business continuity for the data centers themselves, especially the protection of staff, partners and suppliers. One of the key areas supporting this has been the level of knowledge sharing in the sector, especially on health, safety and wellbeing procedures, and on HR and supply chain issues. It has also involved a two-way conduit with Government. In the UK for example, the DCMS Data Infrastructure Resilience Team has been established to ensure data centers are factored in when key policy decisions are made.

Most significantly this has meant limiting routes for infection and dealing with the reality of site lockdowns. This has required restricted access to facilities and the introduction of split rosters whilst observing social distancing practices. It has also introduced associated availability issues, primarily the reduction of personnel on site and the absence of key staff due to illness or self-isolation.

Critical facility walkthroughs are particularly important for risk reduction and so remote management capabilities are vital. The combination of sensor technology, support services for troubleshooting such as 'Smart Hands'¹⁰ and system monitoring in key performance areas notably power distribution and temperature, is enabling heightened levels of real-time remote visibility. And with this comes the capacity for advanced levels of data analysis and predictive capacity around potential incidents. Indeed, alongside satisfying the demands for computing capacity, speed, reliability and power, Coronavirus has also brought to the fore, just how much of a data center can be effectively managed remotely. But more than this, across work, study, communication and entertainment - and to better understand the virus and support interventions in treatment - the role of data centers has now moved visibly center stage.

To read this and other articles on our website visit:

<https://www.kingston.com/solutions/servers-data-centers/coronavirus-demands-on-data-centers>

1. 5G, edge computing & the Future of Data Centers

2. de-cix.net: DE-CIX sets a new world record: More than 9 Terabits per second data throughput at Frankfurt Internet Exchange

3. digit.fyi: ISPs Report Surge in Internet Usage as People Stay at Home

4. standard.co.uk: BT removes home broadband limits during Covid-19 outbreak

5. blog.thousandeyes.com: State of Internet Health During COVID-19

6. iea.org: Data centres and data transmission networks

7. covid19-hpc-consortium.org: The COVID-19 High Performance Computing Consortium

8. economictimes.indiatimes.com: Covid-19: Here's why people are hoarding toilet paper

9. azure.microsoft.com: Our commitment to customers and Microsoft cloud services continuity

10. datacentrenews.eu: Equinix restricts access to Europe data centres to prevent COVID-19 spread



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