
Why State of the Art Facilities Require State of the Art Infrastructure



Introduction

As advancing technology makes doing more faster a reality, all industries face the same problem. Digital transformation, the Internet of Things, AI, and machine learning are no longer experiments or curiosities – they’re a vital part of effective operational scaling.

Companies are looking ahead to ensure that they have the corporate real estate and critical infrastructure in place to allow their operations to thrive in what is often a very tough market. From a corporate real estate (CRE) and critical facilities management (FM) perspective, there are many different approaches. Behind their global offices is the need to offer digital solutions, data storage, and meet an increasing demand for big data analytics.

All require infrastructure to keep operations running efficiently and smoothly. Data centers provide the backbone. But without cabling and super-fast connectivity, these businesses would be unable to compete.

It is therefore crucial for global heads of facilities management and corporate real estate to ensure they have the right people, processes and technical infrastructure in place to maximize their organization’s ability to deliver products and services to their customers.



Technical demands

Yet global heads of FM and CRE face a number of challenges, such as the high technical demands of new critical facilities and upcoming capital projects. This means the facilities must be equipped to meet existing user demand and the mounting need for collocated data storage and retrieval. Furthermore, they must be able to handle already onerous latency equalisation requirements.

In this environment, fiber, cabling and wireless infrastructure can't be an afterthought. Each company's ambitions for its facilities will be almost entirely dependent on the quality of their infrastructure, because without it nothing can realistically be achieved. This dependency requires global heads of FM and CRE to demand a higher bar from physical equipment and the means to put the right expertise into operation.

Speaking specifically to the Financial sector, Clive Longbottom, Client Services Director at analyst firm Quocirca, says the Finance function within banks must consider the benefits that cloud technology can bring to support corporate real estate in the form of, for example, smarter buildings and data centers. Chief Financial Officers also need to provision global heads of CRE and FM with appropriate budgets to enable investment in future-proofed critical infrastructure – such as cabling and data centers.

“If a company is to make the most of the possibilities cloud brings, it has to embrace hybrid cloud,” says Longbottom. “Therefore, latency across facilities becomes just as important as latency within a facility. Architecting the overall platform to ensure that massively latency-sensitive functions are collocated and wired effectively is the key.”

CLIVE LONGBOTTOM,
Client Services Director at Quocirca



Mission critical systems

So, this is where systems architects must focus. Some mission critical systems may need to remain within an owned facility for example, permitting a bank to have total control over everything - or within a collocated facility with high speed interconnection and external connection capabilities managed by a third party. “Inter-cloud connections will need facilities such as Express Route or Direct Connect – but these will only be as good as the internal connectivity that leads to them,” Longbottom advises.

John Curran, VP for Product Management, Managed Systems at Vertivco, warns global heads of CRE and FM that any new facility “will be required to adapt to an ever-changing technical landscape of IT equipment

and services and an ever-changing financial landscape of CAPEX spend then contractions, similar OPEX trends, insourcing then outsourcing and many other trends that may not be common practice today.”

This means that critical facilities need to be constructed and equipped to be able to scale up and down resources whenever demand necessitates it. There is also a need, he says, to allow for incremental expansion to align with the business and similar contraction as the business goes through technical and business cycles.

Growing demand on facilities and networks

The real estate side shows a move towards colocation because there are often uncertainties around how a data center will need to grow or to shrink with changes in demand. Longbottom says this challenge “makes designing and maintaining a single-occupancy facility difficult.” Demand is nevertheless increasing for facilities and networks. Why? Users are demanding ever faster response to ensure they can work more efficiently. He says big data and artificial intelligence projects are also “massively stressing existing facilities and networks. Add to this the growing capabilities of new hyper-converged systems and the need for better interconnections is obvious.”

In summary, there are two main drivers: the digitalization of every aspect of business – from customer interaction to fulfillment and after-sales service. And the adoption of artificial intelligence (AI) and machine learning. Machine learning and AI are being deployed to predict customer demand, reduce back-end operations, to ensure regulatory compliance, to improve big data analytics and even to automate some roles in financial accounting. The impact of this could be the replacement of workers with robo-advisers, and by automating systems to improve operational efficiency.



Efficient, high quality cable infrastructure

Efficient, high quality cable infrastructure will therefore play a huge part in capital investments and facility design over at least the next 25 years. Without it, life cycles will be truncated and costs difficult to recoup. It's also worth noting that data centers have always been subject to high volumes of demand because whenever markets emerge and grow, demand simultaneously increases. It's a prerequisite to architect data centers in a way that allows for flexibility in the face of changing demand, and for regional and worldwide interoperability.

Longbottom adds: "We have gone through 10MB/s, 100MB/s and 1TB/s, with 10TB/s, 40TB/s and higher connectivity now available. Just accepting that today's highest speeds will be the end is nonsense: IT has to accept that higher speeds will always be required and must plan for approaches such as bonding to meet mid-term needs and for mass replacement of networks as required without the need for mass replacement of server and storage hardware or for major changes to functions and applications running across the network."

As the demands on bandwidth grow, cabling systems need to do the same. The choice of cabling for each data center will vary, depending on several different factors – transmission distances, space restrictions, and budget all need to be factored in when choosing a cabling strategy.

For that reason, there is no correct answer to the age-old question – copper or fiber?

Copper has relatively low deployment costs because there is no need to buy additional hardware. Fiber cables, on the other hand, have the obvious speed advantage and are less prone to damage.

The answer depends on each specific context, but the optimal solution for most may be to mix and match the two different arteries of the network infrastructure. This is where media converters come in – allowing data center designers to ensure the different signal types between the cabling formats work together.

Once the hardware is in place, the task becomes all about optimizing traffic over that network. To get the most out of the available resources, everything must be connected not only by hyperspeed bandwidth, but to intelligent bandwidth that optimizes the traffic going across the connections.

Software-defined networking (SDN) provides one of the solutions. SDN takes the network management functions from the network devices to an application that can be used to intelligently manipulate and control the network without the need to do this via switches and routers. Bandwidth can then be allocated dynamically to the applications that need it the most.



New infrastructure

New infrastructure must not be designed with today's usage in mind. It must be designed to accommodate spiraling demand five, ten, or even fifteen years in the future. Predicting demand isn't easy, but any super-adaptable data center of the future needs to be designed on the basis that the management and operation of infrastructure will be as critical as the provision of IT services.

New data centers must be built to handle the unprecedented and ever-increasing traffic levels, to prevent and avoid energy overconsumption and heat dissipation problems. To achieve this prevention, the data center must be designed to adapt to its energy consumption – in accordance with the current or predicted IT load, and to the prevailing external conditions.

Efficiency and uptime

Why are these considerations important to senior corporate real estate, CIOs and critical facilities management executives? Banks, financial services, healthcare, technology and many more organizations need critical facilities such as data centers to operate efficiently at a high level of uptime. Having a facility that fails could lead to remonstrations, and eventually being fired. Senior corporate real estate and facilities managers must therefore focus on ensuring service delivery, while minimizing operational costs to consumer the least amount of capital.

“Remember in many cases a data center will run at a certain mW load based on a ‘personal preference’ of the organization for optimal operational conditions: e.g. It is not unusual for a data center to run at an air temp of 72°F (22°C), 24/7, even when the IT load has reduced to an idle state, which consumes wasted mW and €.”

JOHN CURRAN,
VP for Product Management,
Managed Systems at Vertivco

The best way to achieve these goals is to follow best practice management – moving away from the traditional model of FM running the facility and IT using it. This may involve using machine learning to deliver infrastructure services, whenever they are needed, and by avoiding any power consumption in preparation for any imagined load. The problem is that this additional load may not appear in reality.



Consolidation

Fewer licences at the hardware and software levels, power and space savings, fewer sysadmins - the cost saving, strategic potential of centralized data centers and network hubs is undeniable.

However, there is increased risk with data center centralization, and so a disaster recovery plan needs to put in place how the data stored is backed up to reduce or prevent any potential downtime whenever a natural or man-made disaster strikes. This in itself can be an argument against data center consolidation and centralization. However, no matter how many data centers are involved, they will still need cabling to provide efficient connectivity.

Senior corporate real estate and facilities management executives therefore need to consider the following points:

- The potential long-term costs of incorrectly equipping these facilities doesn't just represent turning a good investment into a bad one. It represents a mistake that could cripple your company's ability to remain competitive
- For this reason, your cabling investments are of critical importance. Choosing correctly from the start can increase the lifespan of your critical facilities
- It can also represent major overall savings in whole-lifecycle costs (in terms of ecological soundness, energy consumption, and heat management)
- Choosing the right partner will also play a huge part in how long your new critical facilities will remain relevant to your various global offices



Network latency

From a data analytics perspective, network latency can reduce timeliness of the analysis and therefore lead to inaccurate forecasts, insights, and predictions.

Another factor to consider is that it becomes cumbersome to back-up data if latency grinds the network to a halt. In turn, whenever there is a need to recover the data, latency can impede the ability of an organization to maintain business continuity. All of these scenarios can be financially costly (including penalties for failing regulatory compliance), and it could even lead to reputation damage.

It's therefore worth noting the following points about efficient and reliable cabling:

- Efficient and reliable cabling is increasingly about more than just efficiency and reliability. In many jurisdictions it's a matter of law thanks to regulatory standards like MiFID II
- This is especially important for critical facilities and all new major capital projects, which will control most network traffic going forward
- The need for uniform latency across your network to control and account for the effects of time lags on algorithmic trading means that your cabling must be consistent worldwide
- High quality and reliability won't just become a part of your company's compliance – it will become key to ensuring compliance doesn't impede performance
- It can also act as a built-in 'check' for compliance. Either through engineering to ensure equivalency or through active compensations to account for small performance fluctuations

Senior corporate real estate and facilities management executives therefore need to work with data center designers to ensure that it's possible to increase network capacity whenever it is required. So, even cabling and network connectivity must be designed to consider the ebb and flow of ever-changing demand to maintain high levels of organizational productivity, efficiency and capacity. A network that has reduced latency will also suffer less from packet loss. Packet loss can lead to data being corrupted in transit, and so some forethought is required to mitigate the effects of latency and packet loss. This may necessitate an audit of a data center's current infrastructure.

Colocation

Colocating business tools in on-premise and cloud servers allows your people to perform with greatly increased agility. But it also requires that more attention be paid to the connections and support between these systems. As you'd expect, this means correct infrastructure design and deployment becomes critical to leverage the power of this approach.

Colocation can increase productivity, but it requires adequate provision in both infrastructure and energy control, and efficiency. Facilities designers must therefore plan accordingly, taking care to build extra capacity in their network to account for the increased load.

Curran says the provision and operation of a data center could be considered as a 'necessary evil' for delivering services to the business: "In many organization the senior management are coming to the realization that the provision of services does not mean an immediate need to own and operate a data center and so look towards 'Colo' as an alternative." He also explains that moving to Colo removes the overheads created by off-loading of facilities operation, resilience management, power/cost management, security and access, and all the simple things like owning or acquiring property, managing green credentials, and energy improvements.

These things take up people, time, and management attention. They do not directly benefit the actual business of the organization. Colocation therefore permits the organization to focus on delivering revenue-generating services – online and offline. Much of this can be achieved, too, with the right state of the art cabling to support a bank's critical infrastructure and thereby its global and regional business operations.

Senior CRE and FM executives should also be able to spend less time firefighting and more time helping their banks to achieve their business and operational goals and objectives – leading to increased competitiveness and higher levels of profitability.

Conclusion: Choosing the right partnership

Naturally, implementing the right infrastructure is easier said than done. And this is what makes partnerships with technology experts like Panduit an important part of the puzzle. We work closely with our clients, offering our expertise to help them build a flexible, scalable and secure hybrid platform that can encompass on-premise, collocated and public cloud architectures.

Along with our fully trained and vetted ecosystem of partners, we can act as the conduit to a full, future-proofed IT infrastructure. Instead of having to source numerous vendors for one project, Panduit will bring in the right partners to meet your requirements. In addition, our robust, preconfigured solutions provide consistently high levels of service across on premise, colocation and cloud environment.

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