SIEMON

New Concepts in Data Center Design and Services

Industry Insight Brief #2

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Transitioning traditional data centers to digital infrastructure introduces new design challenges and considerations in selecting related services. For data centers looking to upgrade, it's important to assess the age and capabilities of the systems running the most critical parts of your business. Research byInternational Data Corporation (IDC) puts the average age of a data center at about nine years old, and Gartner says that if you haven't refreshed the data center for more than seven years, it is now considered obsolete.

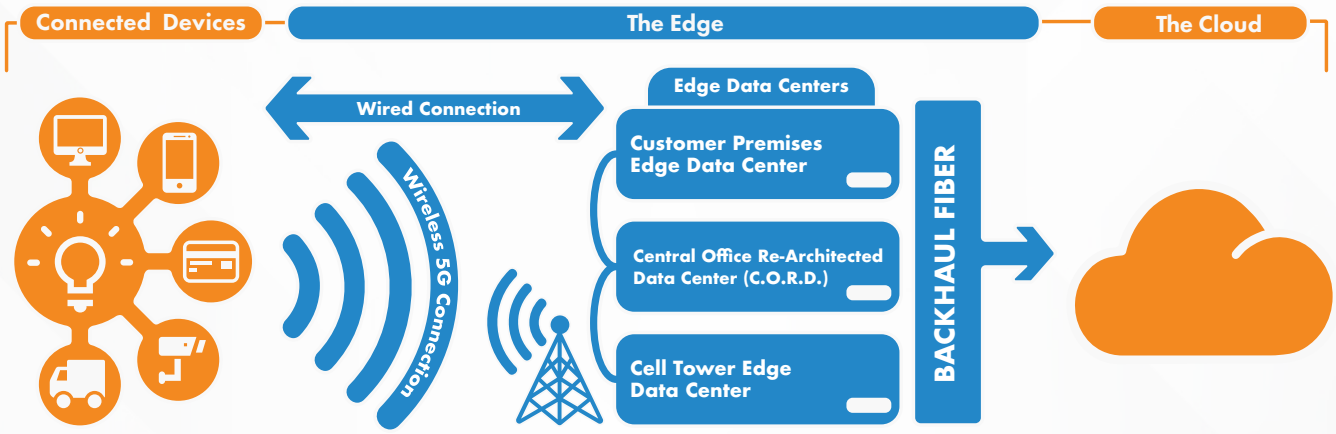
The first step in truly embracing a digital infrastructure is to understand and consider the following significant trends impacting the data center today.

Edge Computing

According to Gartner, around 10% of enterprise-generated data is now created and processed outside of centralized cloud data centers. By 2025, Gartner predicts this figure will reach 50%. As mobile applications increase and more technologies and applications demand low-latency via decentralized networks that brings compute systems closer to devices and users, services around edge computing will continue to evolve and grow. As the need for edge computing takes hold, data center owners and operations need partners who can help them address common issues like consistency between deployments, reliability, remote installation, connectivity, monitoring and management, and security. Ensuring optimal performance at the edge also requires more focus on connectivity to ensure bandwidth capacity—both at the edge to support application needs and within backhaul networks to support transport of aggregated data to the core.

5G

Gartner noted that fifth-generation (5G) mobile networks were one of the main drivers for mobility in 2020, with the market for 5G infrastructure hitting more than $4 billion and two-thirds of companies deploying 5G in 2020. According to Ericsson, more than 320 million 5G subscribers are forecasted in the U.S. by the end of 2025 alone. The connectivity around 5G and new telecommunication solutions are poised to revolutionize how we work, live, and stay productive. In fact, a recent ConsumerLab research report showed that the fastest-growing mobile app categories during the Covid-19



period were linked to remote working, education/e-learning, and wellness. That same report indicated that 6 out of 10 U.S. workers expect to switch to video-based conferences permanently. This shift caused by the pandemic will give rise to a variety of connected 5G technologies that will continue to transform and automate our everyday lives over the next decade.

Edge data centers are crucial to supporting 5G, handling the initial processing for low-latency communication and aggregation of data from billions of devices. These 5G edge data centers are often self-contained modular data centers located at or near 5G cell towers or access sites. When looking at the new Data Center Value Equation, companies need to determine how prepared they are to leverage 5G initiatives while service providers rolling out 5G need to ensure they have the advanced fiber connectivity, cable management, smarter power distribution technologies, and thermal management required at the edge.

Smart Buildings and Cities

Outside of 5G technologies globally, there's a connected revolution going on inside the walls and ceilings of modern buildings. More devices than ever are converging onto a shared IT infrastructure, allowing building systems like voice, data, security, AV, LED lighting, security, and HVAC to communicate via Internet Protocol (IP) for significant cost savings and sustainability over the facility's life, as well as for improving overall building occupant experience, well-being, and productivity. Leveraging the IT physical infrastructure also enables cost effectively powering system devices via Power over Ethernet (PoE) technology—everything from IP phones, desktop computers, and wireless access points, to surveillance cameras, LED lighting fixtures, distributed antennas, and building automation devices. Smart buildings are also the foundation for smart cities, where data about the built environment will be aggregated and analyzed from multiple smart buildings to create smart cities. Data centers therefore need to be designed to handle increased amounts of data from smart buildings and facilitate the broader connectedness level required to become a critical component within the larger smart city ecosystem.

Cloud Computing

While cloud computing will continue to be adopted for many business applications and for advanced data analytics, the AFCOM State of the Data Center report indicates that three in four respondents (72%) reported noticing a trend for organizations to move away from the public cloud. For many, the cloud was originally viewed as a saving factor that enabled increased

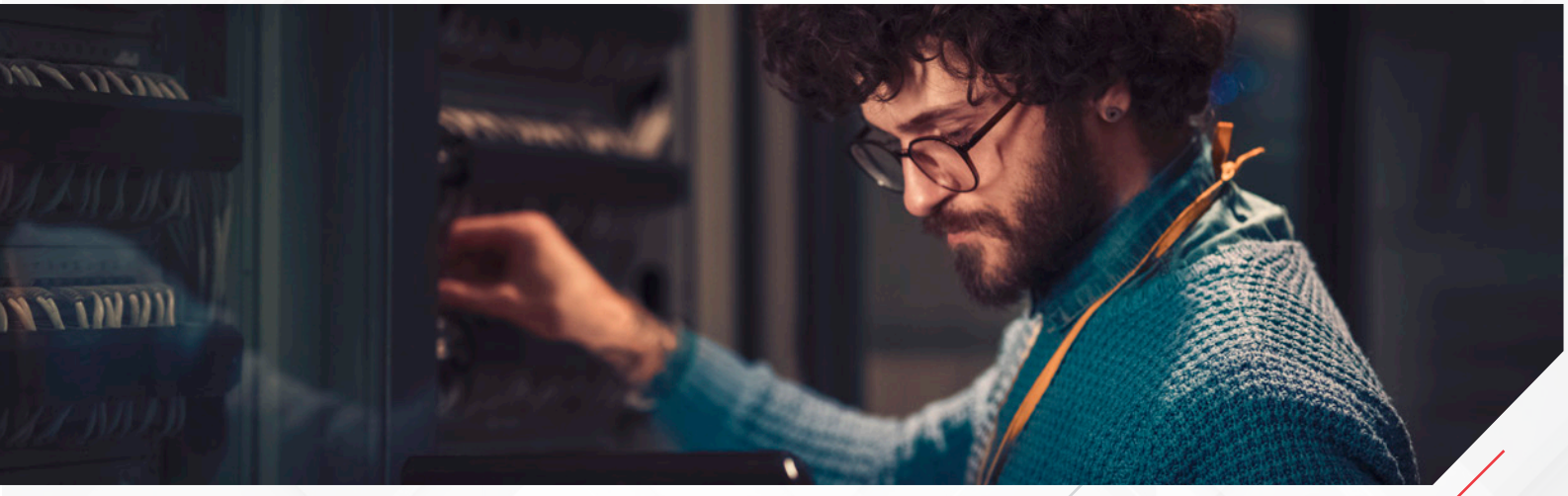
agility, but many are realizing that not all internal and mission-critical business applications make sense to move to the cloud due to security and compliance concerns, as well as lack of control and the potential for overspending on data transport costs. At the same time, many on-premise enterprise data centers do not have the infrastructure in place to support digital transformation. As a result, hybrid (public and private cloud) and multi-cloud ecosystems are gaining ground as a way to create resiliency alongside super flexible services for all types of users and applications.

Overcoming Digital Design Challenges

While it's undoubtedly essential to evolve to support these trends in our digital economy, it's also critical to know where there are hurdles with new digital solutions and their impacts on data center design. Some significant challenges and considerations to be aware of are as follows:

Keeping things modern and efficient
When it comes to the innovation aspect of the value equation, complacency and a fear of testing new technology can limit the ability to be a part of the digital economy. A challenge often seen within data centers is making modernization only a partial effort. However, even if all data center systems do not need to be updated, it's still important to assess and understand the capabilities of the infrastructure. For example, will your copper and fiber infrastructure enable the bandwidth to support future emerging applications?

Maintaining High-Performance Connectivity
Latency, connectivity challenges, and flat-out outages are incredibly detrimental to business operations. To the network infrastructure professional, that means an ongoing effort to ensure that the infrastructure design supports the bandwidth and connectivity to support exponentially increasing application speeds and deliver critical network services to the enterprise. Even as network technologies advance at a breakneck pace, one thing remains constant: The LAN is the backbone of the enterprise, and the data center is the backbone of the LAN. As LANs are being tasked with handling more traffic from various devices and systems, data centers need hyperconverged architecture to support high-performance computing. Remember, not every cable is made the same, and not every networking solution



can handle high-performance, high-density, and reliable communications. That requires working with network and connectivity leaders in the data center space who can help ensure the right solutions.

Managing complex environments

The more connectivity we need to support trending technologies and applications, the more complex data center infrastructure can become. This is why you need to look for systems that provide easy-to-use navigation that renders powerful hierarchical and subcomponent diagrams of data centers, IT inventory, and networks. To reduce complexity, you need to have the visibility, control, and governance to improve capacity planning and energy consumption. Furthermore, more connections in less space calls for solutions that facilitate management and access in high-density environments. A reduction in complex systems helps administrators reduce downtime for improved service levels.

Balancing efficiency and green solutions

Efficiency, modernization, and green solutions go hand-in-hand. However, too often, ensuring that the data center design is green or sustainable is left towards the end of an architectural discussion. Going green isn't only good for the environment; it's also great for business. Numerous reports have indicated that greener business does better in a digital economy. This is why data center design from the very beginning should consider improved power usage efficiency (PUE) and reduced power and cooling costs. This includes ample airflow in and around equipment, strategic cabinet placement, proper power distribution. Power and thermal monitoring capabilities are also key—the more visibility into these systems, the more you will be able to make adjustments in near real-time to ensure improved uptime as well as efficiency. At the component level, data centers should also consider component lifecycle, compliance with green regulations, and the overall sustainability efforts of the component supplier.

Incorporating security into a physical design

Protecting your business against malware and other cyber attacks is critical. However, ensuring physical data center security is also vital. Hardware and software systems that deliver superior cabinet-level access control for mission-critical data centers and other telecommunications spaces improve the data center security posture, simplify administration, and facilitate compliance with privacy regulations such as HIPAA, PCI-DSS, FIPS, and the EU's GDPR.

Considerations for Cloud and Managed Services Providers

With the increased pressure on internal enterprise IT teams to digitally transform, it's unsurprising that millions of organizations are entrusting their IT to both cloud service providers (CSPs) and managed service providers (MSPs) to shoulder some of this responsibility. If you're a CSP or MSP, much of your success will revolve around the types of partners that you work with, and it is vital to work with solutions that suit your business strategies and meet service level agreements, while keeping customers nimble.

Changing work patterns and business processes also drive additional demand for rapid deployment, scalability, and reliability, while performance, costs, and operational efficiency have never been more critical. As a CSP or MSP, you therefore need data center infrastructure that allows you to expand resource provisioning quickly and efficiently in response to your client's changing needs. That means ensuring that you work with the right partners with solutions that allow you to scale at speed. At the same time, you need to ensure that you're deploying industry-leading quality, performance, and reliability, which combined, help you reduce risk, maximize uptime, and successfully deliver new applications and services. To help you ensure rapid deployment and scalability, superior performance and reliability, reduced risk and improved cost controls, and operation efficiency and infrastructure sustainability, your selected partner should:

1. Have a clearly defined roadmap for the future and an eye on evolving technologies
2. Ensure that R&D focus is on innovative solutions for manageable high-density environments and aimed at enabling fast deployment and simplified maintenance
3. Enable direct collaboration with engineering and architectural teams to quickly design, modify and customize solutions
4. Value synergistic operations and processes across all locations to ensure global consistency
5. Have global capabilities and partnerships around the world with stocking distributors, Certified Installers (CIs), and system integrators
6. Provide superior technical support and customer service with efficient logistics and local staging to ensure on-time delivery
7. Make sustainability and green initiatives a priority across all products and operations

Supply Chain Management Matters in a Digital Era

Finally, a significant part of improving your digital infrastructure is also to ensure you have a good supply chain in place. Even if you're not the one sourcing equipment or cables, you need to ensure that your partners have reliable supply chains in place. That is why it's critical to ask questions and challenge your partners on their supply chain management. Some important questions to ask include:

1. Does the supply chain have strategic importance to the partner?
2. Has the supply chain undergone strategic development? If yes, what type? If not, why?
3. Is quality embedded in the supply chain? That is, is quality built into your supply chain, or do inspection and correction occur after the fact?
4. Where are there potential risks? What are they?
5. Are supply chain and business strategies aligned?
6. Does the supply chain allow room for change?
7. Do you have change management processes that are built-in and that continually review your supply chain elements? Do they also look for opportunities to improve quality and operational efficiency?
8. Does your supply chain minimize the number of touches and the touch time in supply chain transactions to reduce the number of potential points of failure?

A key component around innovation and modernizing digital infrastructure revolves around working with partners to support and facilitate this change. *Another critical point is actually understanding what some of this change looks like.* Getting to an improved Data Center Value Equation means removing legacy paradigms and adopting a new digital thought process at the data center level.

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