DATA CENTER Frontier Special Report

How Hyperscale Will Disrupt the Data Center Market

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Summary

The data center landscape is being transformed by changes in end user requirements and innovations in facility design. These trends come together in the hyperscale data center, which brings new levels of scale and efficiency to IT infrastructure.

The shift toward hyperscale data centers is driven by a changing environment, featuring more users, a lot more data and new technologies capable of carrying information over vast, widely-distributed distances.

In today's digital economy, data centers must operate with hyperscale capabilities to meet demand, stay competitive, and provide new digital services.

The latest Cisco Cloud Index report provides a window into the evolution happening within cloud and the data center platform:

- Traffic within **hyperscale data centers will quintuple by 2020.**
- **Hyperscale data centers will account for 53%** of all data center traffic by 2020.

Overall investment in IT infrastructure for off-premises cloud environments—both public and private—will reach $28.4 billion, according to IDC. Meanwhile, spending on enterprise IT infrastructure in traditional, non-cloud environments will fall 1.8 percent year-over-year (but will still account for the largest share—63.1 percent of end user spending).

All of these trends are fueling the push for better ways to deploy critical data center services. Organizations are looking for better ways to deliver critical resources like hybrid cloud, big data processing, and web applications. To support this growing trend, a powerful, **hyperscale** platform has emerged to offer the required speed and flexibility.

Demand for Cloud Services

"Cloud is one of the major options considered by end users as they think about optimization of their IT operations and utilization of on-site and off-site resources," Natalya Yezhkova, research director for IDC's Storage Systems unit, said in a statement. "This demand for cloud services will continue to drive the underlying shift in IT infrastructure spending from on-premises to off-premises deployments. As public cloud data centers represent the major segment of off-premises IT infrastructure deployments, overall spending done by this segment is closely tied to spending by public cloud service providers, in particular, hyperscale SPs."

Traditional data center platforms can be challenging to scale out, with problems around configuration time, resource usage, and even the issue of using an improper server architecture for the job.

To help combat these issues, organizations must look to leverage purpose-built data center partners which are capable of performance at a hyperscale level.

Not every data center can customize a hyperscale solution that can best fit your IT and business needs. In this guide, we'll define what it means to be a hyperscale data center, major trends around the digital revolution, and how to leverage the right type of partner for your hyperscale data center needs.

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Introduction

New technologies are paving the way for more efficient environments that can scale with the demands of the business. This means that the IT infrastructure must do the same. Data-on-demand has become the new norm in the user world.

Gartner recently pointed out that more than $1 trillion in IT spending will be directly or indirectly affected by the shift to cloud during the next five years. This will make cloud computing one of the most disruptive forces of IT spending since the early days of the digital age.

"Cloud-first strategies are the foundation for staying relevant in a fast-paced world," said Ed Anderson, research vice president at Gartner. "The market for cloud services has grown to such an extent that it is now a notable percentage of total IT spending, helping to create a new generation of start-ups and "born in the cloud" providers."

IDC further points out that total spending on IT infrastructure products (server, enterprise storage, and Ethernet switches) for deployment in cloud environments rose by 18.2% in 2017 to reach $44.2 billion.

All of this has created a real-world requirement around cloud computing services, which in turn has boosted requirements for hyperscale data centers. New scenarios are emerging in which your data center is now a direct part of your global IT platform.

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The latest Cisco Cloud Index Report indicates that the increasing need for data center and cloud resources from both the business and consumer service perspective has led to the development of large-scale public cloud data centers called hyperscale data centers. Hyperscale cloud operators are increasingly dominating the cloud landscape. Consider this, hyperscale data centers will grow from 259 in number at the end of 2015 to 485 by 2020. They will represent 47 percent of all installed data center servers by 2020.

This guide will take a look at key considerations when it comes to working with and selecting a hyperscale data center partner, what it means to actually go "hyperscale", and how this will impact the future of the data center and the overall market.

SECTION 1
Defining Hyperscale and Understanding Major Industry Trends

There are more users, complex applications and data points accessing your infrastructure. Now, new kinds of demands are requiring modern organizations to rethink their data center environment, delivery model, and how cloud architecture can be utilized even more.

A recent Deloitte Technology report projects that by the end of 2018, spending on IT-as-a-Service for data centers, software and services will be $547B. Deloitte Global predicts that procurement of IT technologies will accelerate in the next 2.5 years from $361B to $547B. At this pace, IT-as-a-Service will represent more than half of IT spending by the 2021/2022 timeframe. Furthermore, cloud computing continues to grow at rates much higher than IT spending generally. Growth in cloud services is being driven by new IT computing scenarios being deployed using cloud models, as well as the migration of traditional IT services to **cloud service and data center provider** alternatives.

This has given the rise to hyperscale data centers which are capable of delivering resources, agility, and improved business economics. Today, the development of large-scale, cloud-ready, hyperscale data centers is evident as their numbers will swell from 259 in number at the end of 2015 to 485 by 2020, according to Cisco's report. **They will represent 47 percent of all installed data center servers by 2020.** As we look ahead, hyperscale cloud operators are increasingly dominating the cloud landscape.

Hyperscale Data Centers

Before we go too much further, let's define hyperscale data centers.

The growth of cloud and mobile applications, connected devices, data analytics and global connectivity have radically changed the IT landscape, having a profound impact on the businesses driving it. These businesses are experiencing an explosion of data causing an immense consumption of IT infrastructure and creating a class of company with data and compute needs far outpacing traditional enterprise companies.

As we look at the modern data center, hyperscale data centers offer the ability to scale appropriately as there is increased demand on the business and IT ecosystem. This means seamlessly being able to provision (and de-provision) critical resources like compute, memory, networking, storage, distributed sites, and more.

In today's ever-growing digital world, hyperscale data centers are basically a requirement for robust cloud, big data, or other types of larger distributed computing.

The need for data center partners who are capable of delivering rapid growth capabilities

Hyperscale data centers offer unique competitive advantages in their ability to support advanced delivery mechanisms and resource controls. This means supporting emerging business services revolving around cloud, big data, distributed computing, mobility, and so on.

If you're working on a cloud or big data solution which requires a data center ecosystem, make sure to understand the difference between traditional and hyperscale capabilities. A hyperscale data center partner will understand your technology requirements and business model and be able to help you solve for big data problems.

Back in the day, with simple apps, you would have a very small team working to solve an algorithm problem within an app whose same output could be used for everyone in a region. Now, you have problems that take mass amounts of data; you have a problem that effects *everyone differently*. Effectively, some of the data is only good for that moment in real time.

Hyperscale technologies take a new approach to data, resource, and service delivery. Take the Uber app as an example. It must update continuously with you and your driver's position, it changes constantly, and is different for everyone. All of this requires huge amounts of data and highly scalable resources. Can your traditional data center keep up? Or, for your bigger cloud and data requirements—maybe it's time to look for a data center which brings hyperscale capabilities.

The future of data center and why hyperscale will disrupt the market

Cisco recently pointed out that hyperscale data centers represent a large portion of overall data, traffic, and processing power in data centers. Traffic within hyperscale data centers will quintuple by 2020. Hyperscale data centers already account for 34% of total traffic within all data centers and will account for 53% by 2020. **Hyperscale data centers will also represent 57% of all data stored in data centers and 68% of total data center processing power.**

From server closets to large hyperscale deployments, data centers are at the crux of delivering IT services and providing storage, communications, and networking to the growing number of networked devices, users, and business processes in general. The future of the data center will revolve around growing trends and truly unique use-cases. However, one fact remains, we'll continue to see more data, more cloud utilization, and a lot more requirements around data processing. Traditional data centers will certainly have their place. However, the rise of cloud and big data will also mean new business requirements and greater utilization of hyperscale systems. This is why it's so critical to work with the right type of hyperscale partner.

SECTION 2 – Selecting the Right Hyperscale Partner

The rapid pace of our evolving infrastructure is forcing data center administrators to make infrastructure decisions at a blistering pace. In fact, many organizations are re-creating their business plans around the direct capabilities of the modern data center. Here's the important piece to understand—the proliferation of cloud computing IT consumerization has created the need for powerful, hyperscale data center platforms. That means your infrastructure must be able to handle an increased density for new types of workloads.

The transition to cloud is happening faster than expected for 3 reasons:

- **Complexity of the traditional environment**
- **Speed to market requirements**
- **Simplification of compute environments**

All of these trends are fueling the push for more efficient data center utilization and more specifically, the deployment of hyperscale data centers. Organizations must work with the right type of partner to help them stay agile and resilient. The data center is becoming a truly integral part of any company. And, at the heart of the IT infrastructure, a hyperscale data center must be capable of scaling with the needs of the business. However, not all data centers are created equally, and many cannot customize a solution to best fit your hyperscale needs.

Hyperscale is now a mainstay in the data center landscape and true hyperscale partners are continually working to create data centers that are suited to meet rapidly evolving requirements. These requirements aim to solve the challenges revolving around traditional environments, help companies create faster go-to-market strategies, and help simplify distributed computing environments.

This is why it's so important to work with a data center provider which can understand your business and deliver true hyperscale solutions.

"It is a full-time job to stay up to date with your managed services, hosting, clouds and colocation environments," said Brian Johnston, QTS Chief Technology Officer. "When it comes to cloud, management, and critical visibility requirements, QTS takes a truly evolutionary—hyperscale—approach."

"A customer portal has traditionally served as the mechanism to view an IT environment, however (like with most things) we need more," Mr. Johnston adds. "QTS recently launched our automated service delivery platform, which leverages digitization and service-based integrated technology that delivers optics and controls that maximize performance through a single pane of glass."

"Technically speaking, we have created set of disciplines that go beyond real estate," adds Mr. Johnston. "In fact, QTS has provided more than just space and power from the very beginning—spanning over 10 years of hyperscale deployments. We have a deeper understanding and appreciation of what challenges hyperscale providers face because we have those same obstacles from a deep understanding of networking and fiber, to being a responsible consumer of energy and a sustainability. Simply put, we are more equipped to better impact hyperscale customers because we are already operating at the speed of the Internet, and we can have sophisticated conversations about occupancy, scale, and hyperscale requirements."

When it comes to cloud and new initiatives, *data is the lifeblood of any organization,* and the hyperscale data center has become the heart. Managers demand new technologies to help their organizations respond to changing business conditions with agility and flexibility. As a result, hyperscale data center trends are evolving rapidly and spending is increasing, especially in multi-tenant environments. Plus, with virtualization and cloud computing in the mix, it is more important now than ever to have the right hyperscale data center partner in place.

New hyperscale technologies are paving the way for more efficient environments capable of scaling with business demands, and hyperscale organizations must be ready to do the same. Data-on-demand is the new norm where more information is being accessed at any given time. To deliver on real-world cloud and data requirements, hyperscale data center may very well be the way to go.

SECTION 3 – Elements of a Hyperscale Data Center

A new service model that has emerged from this increase in demand: *Hyperscale Service Provider (HSP)*. Hyperscale has come to mean a lot of things, but at its core is the ability to scale all elements of IT architecture and provision rapidly to meet demand as it increases.

This is where QTS Data Centers, hyperscale data center and HSP, combines both maturity and innovation. This is required to help a business meet and exceed their growth strategies. When it comes to working with a hyperscale service provider—QTS delivers:

- ***Speed*** – Hyperscale companies require an optimal mix that includes speed of deployment and speed of daily operations. Often needing fast provisioning of 2, 6, 20, or 50+ megawatts, these companies need a partner with the inventory and scale to match their needs. In addition to time of delivery, Hyperscale companies have a need for speed that spans logistics (dock to rack), contracting, access to information, maintenance, incident resolution and reporting, among a myriad of other requirements.
- ***Flexibility*** – A good HSP will quickly understand that their customers are operating at the **speed of the Internet.** There are nuances in their business model that require flexibility that covers power delivery, usage, contracting, SLA's, and day-to-day data center operations. Furthermore, HSP will be able to adapt, at the pace of the industry, to your specific data and cloud demands.
- ***Competitive Economics*** – Data center value extends well past the cost per kW. Hyperscale customers require predictability and tremendous economic value around Total Cost of Ownership (TCO). The best hyperscale data center service providers understand what it takes to operate at scale. This knowledge, combined with the ability to spread costs across a large inventory, enables customers to garner value in upfront pricing and the ongoing operational costs of their environments.
- ***Proven Operational Excellence*** – Hyperscale companies need a partner that can deliver the same operational excellence that they have come to expect from their own centers. Hyperscale Service Providers like QTS not only deliver on capability, they also carry an industry-leading NPS scores as a testament to the importance placed on process, procedure and customer communication.
- ***Ultimate Visibility*** – Transparency spanning the delivery of important usage data can be accomplished via QTS Service Delivery Platform (SDP); where you'll understand time to provisioning, maintenance windows—all the way to a simple and clear understanding of pricing/billing. Furthermore, none of this can be complicated. A good HSP will take the time to make your most critical business processes efficient, and much easier to execute.

The best hyperscale data center service providers understand what it takes to operate at scale. This knowledge, combined with the ability to spread costs across a large inventory, enables customers to garner value in upfront pricing and the ongoing operational costs of their environments.

Understanding hyperscale deployments and use-cases

Private, Public or Hybrid—A good data center partner will offer enterprise-grade cloud (AWS, Azure, for example) environments designed with the ultimate scalability in mind in order to meet your ever-changing business needs. Beyond cloud, there are so many different types of use-cases where hyperscale data centers can make a powerful impact.

Hyperscale buyers employ distinctive data center growth strategies that can include "availability zones/nodes" in strategic regions, edge strategies, or simply raw economic requirements. Consider these three hyperscale deployment use-cases:

- ***Availability Zones*** – If your company has a larger footprint which requires multiple data center locations—it's important to look at availability zones and how they work for your strategy. For example, QTS solved for a three-node delivery strategy for large-scale social media company. This solution included 20+ megawatts, super economics, and a highly efficient PUE design.

- ***Edge Strategies*** – Your cloud is getting bigger; growing more into the edge. This means working with big data requirements, distributed cloud computing, IoT, and even advanced data analytics. An optimal footprint of data center locations across the country will help create real-world competitive advantages for your organization. A use-case around edge strategies involves one where QTS helped an emerging cloud organization achieve its goals. This includes a solution for a growing cloud organization, giving them the flexibility to start with smaller deployments with a path to 10+ MW edge deployments in multiple locations. From there, as a good partner, they were able to align strategies and forecast for cloud growth as well.
- ***Raw Economics*** – Cloud-ready hyperscale mega data centers allow hyperscale companies the comfort of practically unlimited expansion with upfront and long-term economics. For example, a large cloud provider has taken advantage of edge deployments in population centers while using the supreme economics provided by QTS Richmond for larger compute needs. QTS also has a keen understanding of local, state and federal tax incentives and has worked in concert with Hyperscale companies to provide immense tax savings on equipment and labor.
- ***HSP Scenarios*** – There will be specific use-cases and scenarios to deploy hyperscale data center architectures. Consider these big two:
  - **Big Data and Analytics** – Gartner recently pointed out that data and analytics will drive modern business operations, and not simply reflect their performance. Furthermore, executives will make data and analytics part of the business strategy, which will allow data and analytics professionals to assume new roles and create business growth. Shifting the way organization uses data and analytics more toward driving business operations requires a new approach to data architectures, which many organizations are already building. Last year, Gartner research found that 45% of IT professionals had indicated that new data and analytics projects were in the "design" and "select" phases.

    Whatever your use-case, working with a data center provider which can keep up with your requirements is a must. What good is the data if you can't process it quickly, gain value, and create fast business decisions? Hyperscale service providers aim to control big data requirements and deliver business benefits.

  - **Cloud** – Gartner recently stated that more than $1 trillion in IT spending will be directly or indirectly affected by the shift to cloud during the next five years. **This will make cloud computing one of the most disruptive forces of IT spending since the early days of the digital age.** Today, cloud computing provides great flexibility to the organizations that deploy it right. Even more flexibility revolves around the deployment of powerful hybrid ecosystems designed to fit evolving business use-cases. Hyperscale data centers are built with the cloud in mind. Literally, bringing the ability to dynamically scale resources, availability zones, edge and cloud computing, and enabling powerful business as well as IT economics.

> "The availability of data, a new generation of technology, and a cultural shift toward data-driven decision making continue to drive demand for big data and analytics technology and services," said Dan Vesset, IDC group vice president, Analytics and Information Management. "This market grew 11.3% in 2016 after revenues reached $122 billion worldwide in 2015 and is expected to continue at a compound annual growth rate (CAGR) of 11.7% through 2020."

At the core of their business and portfolio, QTS delivers on the needs of hyperscale organizations and truly understand the problems they are trying to solve. This breed of hyperscale data center providers is capable of helping hyperscale organizations better leverage their own investments to stay truly competitive in an ever-evolving digital economy.

Conclusion

The increasing need for data center and cloud resources from both the business and consumer service perspective has led to the development of large-scale cloud-ready data centers built for hyperscale capabilities. Today, hyperscale cloud operators are increasingly dominating the cloud landscape.

High-density equipment, cloud computing, and virtualization have all helped shape the **hyperscale** movement. Now, organizations have to look for flexible options since their needs may change much more quickly than in previous years. With technology evolving at the pace that it is, data center administrators are consistently tasked with providing optimal service and maximum flexibility.

In working with a hyperscale data center partner, remember to plan out your infrastructure for the future. This means plans around capacity, redundancy, and even future growth should be established. In 2017 and beyond, the data center will continue to be leveraged as a key piece for any organization. As more data is pushed through an IT infrastructure, DC managers will have to find new ways to keep their environments flexible and, very importantly, scalable. Hyperscale data centers help solve some of the biggest cloud, virtualization, and even big data challenges by designing an ecosystem built around efficiency and scale.

In 2017 and beyond, the data center will continue to be leveraged as a key piece for any organization. As more data is pushed through an IT infrastructure, DC managers will have to find new ways to keep their environments flexible and, very importantly, scalable.