

CAPACITY PLANNING IN THE AGE OF THE CLOUD

Options abound for a high performing, intelligent infrastructure.

Urging patience, Civil War era historian Thomas Fuller said, “All things are difficult before they are easy.” In IT, you might rephrase that to say all things are complex before they are simple.

Rising pressures to innovate and the need for speed driven by customer demand push IT to find ways to ensure server, storage, and networking are ready to be allocated when required. On-premises. Colocation. Cloud. Whether you’re an enterprise enduser or a cloud service provider there are many options for high-performing infrastructure.

More and more, organizations are taking a hybrid approach, allowing the risk tolerance of each application to drive the what-goes-where decision. This hybrid approach doesn’t have to mean putting IT in unknown corners of the world with multiple providers. In many cases, the whole hybrid environment can exist under one roof.

By Kirk Offel

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But with these new options comes the need for a new approach to capacity planning. Effectively managing IT infrastructure in this new age requires having the right lineup — people keenly aware of the business goals who have a firm grasp on the strengths and weaknesses of every tool in the belt and facilities with the capability to be adaptive.

Cloud service providers (CSPs) and enterprise endusers have adopted similar approaches to capacity planning in the age of the cloud, yet the way they execute on those approaches is quite different. In a nutshell: The cloud service provider model and enterprise model are inverse examples of each other. CSPs turn to colocation to handle overflow. Enterprises turn to the cloud.

Cloud service providers’ capacity strategy begins with a build, own, and operate model. Yet CSPs have to anticipate new capacity demand driven by business changes — mergers and acquisitions, major purchases, or digital business developments, for example. When their cup spills over, CSPs meet their need for extra capacity by outsourcing to a wholesale colocation provider.

ENTERPRISE CAPACITY PLANNING 1.0

Most enterprises (80%, according to 451 Research) still operate the majority of their data centers on-premises. Yet as enterprise endusers outgrow their on-premises facilities, they most often turn to colocation. If they’re in an unfamiliar market, they’ll use a bro-

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ker to help navigate the process. Balancing the economies of scale — more capacity for a better price — and a forecast of their future needs, enterprise endusers typically ask for more capacity than they need at the time, build in a ramp that will get them to that level in two or three years, and hope capacity demand increases in line with the ramp schedule.

Over-provisioning and under-utilization go hand-in-hand. The average data center is utilized at 56% capacity, according to 451 Research (other estimates are even lower). On the upside, over-provisioning mitigates the risk of a situation where the business can't grow because it lacks the IT capacity needed. On the downside, the practice of "over-provision and forget" increases capital and operational expenses. And in an age that demands on-demand IT, it's just not flexible enough. The world is moving too quickly for traditional, long-term fixed contracts.

ENTERPRISE CAPACITY PLANNING 2.0

The enterprise approach is changing. Enterprise endusers are increasingly moving to a more right-sized colocation approach and using cloud service providers when extra capacity is needed. As 451 Research explains it, "The push to become increasingly agile and cost efficient has led enterprise endusers into hybrid data center environments with workload deployments spread across on-premises, colocation, and cloud data centers."

In addition to keeping the lights on, IT plays an important role in creating alternatives to the over-provisioning model, forging the way to a hybrid environment. Use of cloud platforms introduces a shift away from a traditional capital expense (CAPEX) to an operating expense (OPEX) model. It also changes the focus of capacity planning from supply to demand. While the cloud makes capacity feel infinite, it is important to keep tabs on true demand. Capacity planning today includes knowing when the cloud is most efficient and which applications make sense where in a mix of on-premises, colocation, and cloud.

A HYBRID MODEL: CRAWL, WALK, RUN TO THE CLOUD

Whether driven by a search for efficiencies or a need to support massive utilization swings — holiday season for retail, high-performance compute (HPC) used by academ-

ics, engineers, scientists, etc. — most enterprise endusers follow a similar path to the cloud:

- Step 1: Dip a toe in the off-premises water with a retail colocation provider for a non-mission critical application like disaster recovery. In this step endusers outsource smaller (typically less than 500 kW) non-essential applications to retail colocation rather than spending the capital to add capacity in an on-premises data center.
- Step 2: Take down more capacity from a wholesale colocation provider. Endusers move larger-scale production applications (typically above 500 kW) into wholesale colocation when they no longer want to invest capital into an area of the business that doesn't generate revenue. Wholesale colocation is OPEX rather than CAPEX and also moves risk off of the business, often a wise move for endusers whose core business is not power, space, and cooling for IT infrastructure.
- Step 3: Layer in managed services to test the cloud. Comfortable with the idea of outsourcing compute, storage, and networking in a colocation model, endusers can take their first real steps to the cloud. They identify canary-in-the-coal-mine applications (which applications those are depends on risk tolerance) and move them to the cloud.
- Step 4: When enterprise endusers succeed with those initial applications in the cloud, they start thinking about moving production to the cloud as well. That transition is made easiest when the cloud service provider is located in the same data center(s) as the enduser is collocated in. Then, moving production to the cloud doesn't mean sending it off into some unknown (and unknowable) ether, but rather just across the data hall.

Getting to the cloud doesn't mean that endusers abandon colocation entirely, but rather that they have some applications in a wholesale colocation model, some in managed services, and some in the cloud — that is the hybrid approach. Determining the mix of applications distributed in a hybrid model is an art form based on an understanding of the risk tolerance of the application and aggregate volume.

Matching the workload to the environment and building a tolerance to the risk involved in moving applications to the cloud are key. Data from 451 Research suggests a prevailing attitude that reliability and security are higher in on-premises data centers than in the cloud. In reality, the researchers point out, reliability and security are likely to vary considerably on a data center-by-data center basis, on-premises and in the cloud.

Turning from the traditional capacity planning approach and embracing a hybrid deployment model gives enterprise endusers the ability to flex into and out of the cloud, allowing IT to meet the needs of all stakeholders more quickly and efficiently. With cloud an integral part of the hybrid IT infrastructure, endusers are able to commit to data center contracts that better align with the actual demands of their business.

THE 'HOME OF EVERYTHING' DATA CENTER

Retail colocation. Wholesale colocation. Managed services. Cloud. At the right data center, an enterprise enduser can access all of these under one roof. After all, the cloud lives in data centers. At the right data center, endusers can move workloads to the platform that it makes the most sense to be on — all under one roof and with the same team of engineers helping to facilitate the hybrid strategy.

But in order to be the "home of everything" the data center has to be adaptive. One aspect of the adaptive data center is intelligent infrastructure, which is responsive, dynamic, scalable, and flexible. It is able to ramp up and down to respond to real-time dynamic workloads and it supports high, mixed, and variable power densities to serve both cloud service providers and enterprise endusers. Another aspect of the adaptive data center is an infrastructure optimization platform that offers clear visibility into both current state and predictive analysis. Tying them together is a data center culture of innovation, a mindset that pushes for better, simpler, more efficient solutions and keeps a focus on customers' business goals.

BOTTOM LINE

The need to deploy new services and products quickly and efficiently is driving changes in how cloud service providers and enterprise endusers plan for their capacity needs. Hybrid doesn't have to mean complex. Once enterprise endusers make that journey off-premises, a single facility can allow them to match applications to platforms, from retail colocation and wholesale colocation to managed services and cloud.

Bob Gill, research director at Gartner, writes about how colocation-based interconnection — that "all-under-one-roof" approach — will be the "glue"

for advanced digital business applications. "The ability to integrate multiple applications, data types, and data sources in a secure, predictable, lower-latency fashion will spell the difference between digital business success and failure," Gill says.

That is capacity planning in the age of the cloud. ■

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