The great IT shift

How the age of the cloud is transforming data center operations

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Introduction

The proliferation of cloud services in recent years

Consider the life of an IT manager, 10 years ago — before the rise of cloud computing from a business perspective. In the absence of virtualization, the conventional IT manager worked with entirely local assets, usually set up inside of an on-premise data center facility, connected to the local network. It was something of an ideal scenario, because physical hardware and software stacks were built according to the security, compliance and reporting needs of the respective enterprise. Sure, there were different applications and workloads at the top of stacks, but the underlying hardware, software, security and monitoring were all consistent. According to Gartner, "Historically, data center strategies focused on keeping applications running, providing sustained and controlled growth, and doing it in a secure and fault-resilient manner."[1]

Today, businesses have the opportunity to deploy workloads in a variety of locations and environments, such as colocation, software-as-a-service and cloud. While there are a great deal of benefits to doing so, this hybrid model can have the potential to introduce a certain amount of complexity as a result of workloads running on outside stacks of operation systems, hardware configurations and networks that may not offer consistent monitoring and security tools. Further, cloud workloads aren't physically or logically attached to a company's network anymore, which can introduce control, visibility and security concerns.

Ultimately, the biggest perceived impact to traditional data center operations is the possibility for a lack of infrastructure management and monitoring in comparison with the level of control that was available in the past. Disparate geography of workloads necessitate the ability to tie systems together in order to regain visibility and control.

"CIOs and IT leaders should not be migrating everything toward cloud services, nor should they be sitting back and waiting for the market to settle. A prudent data center strategy incorporates the best of both worlds, for the right reasons, at the right time."

Gartner, The Future of the Data Center in the Cloud Era[1]

Data center transformation

The rise of cloud computing as a component of many IT strategies often precipitates the question of how the data center is affected. As indicated by Data Center Frontier, the looming death of the data center as a result of the cloud is often brought up, but such a consequence couldn't be farther from the truth. Without data centers, the cloud wouldn't exist; its life begins and ends inside of them.

1. Gartner outlined three key findings1 on the data center's future in a cloud-dominant world:
2. Cloud services will evolve into an integral part of all IT strategies.
3. A multi-cloud strategy will become a common strategy for the majority of enterprises.

On-premise or enterprise-owned data centers will continue, but applications and business demands will determine where compute resources come from.[1]

According to the Verizon State of the Market: Enterprise Cloud 2016 report, 69 percent of enterprises report having been able to use the cloud to reengineer business processes. In addition, 53 percent of businesses use 2-4 cloud providers.[2]

Most organizations throughout every industry use the cloud in some capacity, and the overall openness to evaluating how cloud services are used continues to rise. Cloud is commonly viewed as the absolute solution for gaining improved operational efficiency, cost reduction and increased security.

Most enterprises run on a diverse array of business applications every day. Dependence on digital applications, as well as high resource demands, present the need for businesses to consider extending IT beyond the traditional, on-premise data center. Instead of relying on an in-house data center or a single vendor for deploying applications, patching together multiple vendors and service providers to support the substantial demands of digital initiatives is becoming a more effective strategy for many businesses.

As explained by Verizon, the hybrid IT model is the combination of cloud (public and private), on-premise data centers and colocation; the hybrid IT model also recognizes the criticality of the network.

The on-premise data center will remain, but the attributes of enterprise applications and business demands are the deciding factor for how those assets are powered. There are mission-critical systems that businesses depend on so heavily that they cannot move off-premise; or, a system could be so aged from an architectural perspective that lifting it off of a server and into the cloud simply isn't feasible. There are also applications that are born in and written for the cloud. Ultimately, many businesses run systems with varying architectures and functions, and those specifics are the force for selecting compute resources.

"Digital business will require the integration of a wide variety of applications and information sources. Some will be traditional customer-owned and on-premises, while others will involve new data types and sources, as well as third-party data feeds."

Gartner, Colocation-based Interconnection Will Serve as the 'Glue' for Advanced Digital Business Applications[3]

Using cloud services to support business goals

Today's IT leaders' perspectives on short- and long-term IT strategies

As stated by Gartner, "The introduction of potentially low-cost cloud services, coupled with ever-tighter controls on capital spending within IT organizations, and the ever-increasing demands by business units for new services have driven IT leaders to rethink both short-term and long-term strategies."[1]

The functions of the data center in the past were simpler than they are today. IT was about making sure applications were up and running, and looking to the future primarily consisted of determining whether any data center assets were reaching end of life, or if the growth of business was creating the need for more square footage.

"A multicloud strategy will become the common strategy for 70 percent of enterprises by 2019, up from less than 10 percent today."

Gartner, The Future of the Data Center in the Cloud Era[1]

Now, IT is a considerably more influential business unit that supports the whole of the organization. IT decision makers face a wide range of options for powering and running applications, and bringing together the right combination of cloud, internal data center and colocation services is a complex endeavor. Every organization's needs are different, and some methods of operating IT are more beneficial in the short-term than for the future.

Creating a flexible data center strategy

Historically, it wasn't uncommon for enterprises to commit to either solely on-premise solutions or cloud. However, the IT initiatives of today are typically not well executed using a strategy exclusive to either on-premise or cloud services.

By placing particular emphasis on applications, workloads and risks, businesses can successfully design a data center strategy that incorporates cloud, on-premise services and colocation, and allows for flexibility while accommodating for the unique technology needs of each area of business.

- **Applications and workloads**

  From application and workload perspective, it's critical to consider the performance characteristics needed.

  For instance, if a business application in an on-premise data center runs on customized hardware and requires acceleration for optimal performance, it probably wouldn't be a good candidate for migrating and hosting on cloud infrastructure. If it's preferred to move the application out of an internal data center, a colocation environment would be a better fit.

  Or, if an application relies on a certain amount of data located in a certain place, or produces particularly valuable data, it would be important to first understand the location of those data sets, and whether it actually makes sense to move them. Moving such an application might seem like a good idea upon initial evaluation, but if it involves data in a disparate location, it could introduce so much latency that reading and writing to remote data store causes dysfunctionality, or the production of so much data that outsourcing to a cloud provider is cost prohibitive.

  Also consider the management layer. If an application gets moved to the cloud, will the people who need access to it to achieve day-to-day monitoring that's at least as good as it is on premise? Assessing all of these variables enable more of a data-driven decision.

"The question is no longer, 'Should we use cloud services to support the business?' but 'How and when can we use cloud services to empower the business?' By focusing on applications, workloads, risk and the short- and long-term needs of the business, a flexible data center strategy can emerge."

Gartner, The Future of the Data Center in the Cloud Era[1]

[1]Gartner "The Future of the Data Center in the Cloud Era" June 2015, refreshed September 22, 2016 by David J. Cappucio

[2]State of the Market: Enterprise Cloud Report 2016. (2016). Retrieved from http://www.verizonenterprise.com/verizon-insights-lab/enterprise-cloud-report/2015/

[3]Gartner "Colocation-based Interconnection Will Serve as the 'Glue' for Advanced Digital Business Applications" July 28, 2016 by Bob Gill

Every application environment has a certain set of hardware and software characteristics that form the workload, and businesses have to assess how associated risks influence where an application will live from the following perspectives:

- **Security**
- **Compliance**
- **Performance**
- **Cost**
- **Manageability**

Dividing business objectives and applications

Gartner has defined three categories, or layers, to distinguish the various business capabilities, and the corresponding applications, that a company needs to effectively deliver its business strategy, and to help IT organizations develop more appropriate application strategies: systems of record, systems of differentiation and systems of innovation.[1]

"What it comes down to, when employing a flexible data center strategy, is deciding what the right place is, at this point in time, for each piece of your infrastructure and ensuring your data center is the nexus for interconnecting those pieces."

Mike Fuhrman, Chief Product Officer at Flexential

From application and workload perspective, it's critical to consider the performance characteristics needed.

Systems of record

Systems of record are often legacy environments. They're a combination of mission-critical systems that businesses depend on considerably, and from a risk tolerance or performance perspective, cannot be moved off premise. Or, a system is old, mainframe-based hardware, or involves very custom, delicate code that can't be easily lifted off of a server and into cloud.

Systems of differentiation

Systems of differentiation are comprised of cloud applications and workloads which were born in the cloud. Often times, systems of differentiation are newer apps, or previously legacy apps rewritten for the cloud, built to take advantage of the many benefits cloud offers; particularly, elasticity and utility compute, and allows for pay-as-you-go consumption. Systems of differentiation have application programming interface structures built to leverage all of the different capabilities that an Amazon or Microsoft, for example, might afford them. Because they were written to leverage the utility computing that cloud offers, systems of differentiation are a natural set of apps and workloads to move into cloud.

Systems of innovation

Systems of innovation are considered something of a political category. Often precipitated by mergers and acquisitions, systems of innovation are born of the inheritance of a new leader's cloud ideologies. IT decision makers may not have much freedom in deciding which applications stay in-house or move to the cloud.

It's important to note that where systems of innovation are concerned, businesses often face a boomerang effect. If an organization subjectively subscribes to a particular ideology over practicality in moving a workload into the cloud, they may face a scenario where it's too expensive, performance is suffering or security is at risk, which results in having to move the workload back in-house where it started.

A combined approach: on-premise, cloud, colocation and interconnection

We no longer live in a world of cloud versus colocation — it is now cloud and colocation, and colocation is truly the nexus for an enterprise to deploy and manage multi-cloud environments. Hybrid IT is the way forward, and there are few businesses that can't benefit from taking an individualized approach to evaluating workloads and applications to determine their appropriate environments.

Fundamental to having a successful strategy around hybrid IT is ensuring the right connectivity between business, workload and applications, wherever they sit. There is no simplified provisioning without secure, high-speed interconnection between applications.

Every business' chosen colocation provider is absolutely critical in successfully bringing together elements of on-premise, cloud and colocated IT. The colocation provider becomes the business hub for connecting, managing, monitoring and migrating technology assets across a large hybrid footprint. Without the right level of interconnection, or adequate security, compliance and managed services, the right levels of service and support can't be achieved, and business is at significant risk.

"Adding external services to your data center portfolio can be an effective means of mitigating risk, while at the same time moving toward a true enterprise-defined data center (EDDC) — one in which the physical location of assets is less important than the services delivered and service levels received. Different application types will reside where the delivery model best supports client expectations, risk, compliance, service continuity and regulatory issues."

Gartner, The Future of the Data Center in the Cloud Era[1]

At Flexential, we offer direct, secure and scalable interconnection that puts control back into the hands of our customers. Every customer is able to view, manage and control resources through a centralized portal.

Flexential delivers:

- **Interconnected infrastructures with other enterprises, service providers and partners**
- **Access to a total IT ecosystem through our facilities and management tools**
- **Selection of the best carriers available for performance and control needs**

Flexential helps organizations optimize IT transformation while simultaneously balancing cost, scalability, compliance and security. With a focus on building trusted relationships, providing valuable support and delivering tailored solutions and reliable performance, Flexential delivers colocation, connectivity, cloud, managed solutions and professional services to 4,200 customers across the U.S. and Canada.

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