IDC TECHNOLOGY SPOTLIGHT

Digital Transformation Drives New IT Infrastructure Requirements

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Introduction

Technology adoption has continually evolved from the mainframes and dumb terminals of the 1st Platform to the mobile, social, cloud, and big data and analytic technologies of the 3rd Platform. These 3rd Platform technologies are enabling a transformation of fundamental business models that are at the core of all organizations. As organizations leverage 3rd Platform technologies to enhance customer engagement via mobile apps, new datastreams are created that provide real-time feedback on their satisfaction as end consumers. This gives organizations an opportunity to enhance the very customer relationships on which the business is based and allows enterprises to begin focusing their energy on improving customer outcomes. These outcomes will be based not on a point in time but across the full life cycle of a product or service in such a way that real-time feedback is continually captured. This datastream accelerates innovation and drives continuous improvement to the product/service delivery model at the heart of a modern business. As organizations transform themselves digitally, business resiliency improves significantly and business operations become more reliable.

Business leaders are challenged to move their enterprises to the next level, a digital business transformation, employing digital technologies coupled with organizational and operational innovation to create new business models and to drive business opportunity. IDC believes that enterprises will either become adept at digital transformation and thrive in the market or fail to master the disciplines and struggle to survive. Many IT organizations are now thinking about how they can help businesses by transforming internal business processes, implementing digital business models, and creating IT-enabled products and services. Applications and data form the foundation of these digital business strategies, and IDC believes that IT executives need to sit at the forefront of the digital transformation process. Data volumes will continue to grow, and the ability of an organization to interpret and act on this data will differentiate it in the marketplace. Traditional IT is being forced to respond as new cloud-native applications emerge that require the transformation of both the IT infrastructure and the IT organization. IDC believes that as a direct result of digital transformation activities in the market, value is once again migrating to the datacenter (see Figure 1).

FIGURE 1

Value Is Shifting to the Datacenter — Intelligence Centralizes for Ubiquitous Access to Apps
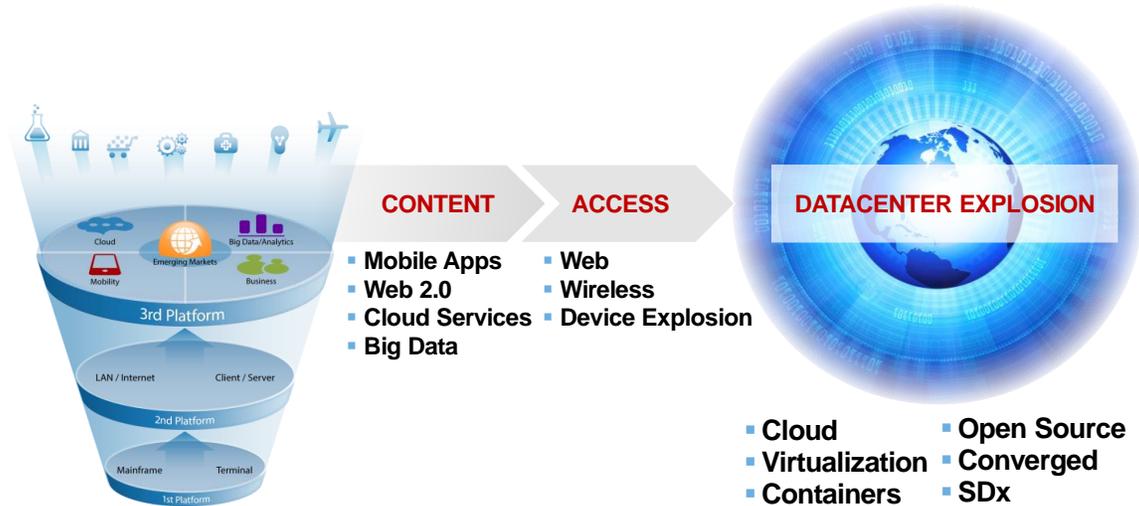
Source: IDC, 2016

As access to data and core content becomes increasingly critical for customers, the importance of a modern infrastructure to the ultimate digital success of an organization can't be underestimated. IDC believes that enterprise technologies will become increasingly important as organizations leverage mobile apps, cloud services, advanced analytics, and software-defined converged infrastructures. Dell and EMC are bringing together a comprehensive set of technologies and capabilities aimed at helping customers successfully make this transformation. This IDC Technology Spotlight discusses Dell EMC's IT transformation strategy to accelerate digital transformation journeys and the company's portfolio of products and solutions that enable enterprises on their progression toward a truly digital enterprise that aggressively embraces new business and IT strategies.

IT Infrastructure Buyer Priorities Shift

As core workloads and business objectives change, the IT infrastructure requires a different set of considerations. As noted previously, IT applications and data services are central to enabling the journey towards a differentiated digital business. The infrastructure that supports these applications must be responsive to the business and dynamic enough to meet the rapidly changing needs of the technology and IT landscape. Infrastructure can no longer be optimized by the traditional process of routinely upgrading equipment and adjusting architectures for new initiatives. Digital transformation requires a rethink of the IT infrastructure's strategic importance and will need to encompass not just technology trends but also, just as important, people, process, and methodologies. IDC believes that a modern software-defined converged infrastructure will become a requirement for many users transforming themselves digitally. These blocks of IT will allow IT organizations to focus on better differentiation in the application and data layers by standardizing on an integrated infrastructure rather than building a special-purpose infrastructure themselves every time they need to stand up a new application.

Most traditional IT organizations continue to spend 80% of their IT budget maintaining existing IT assets. This leaves precious few resources to invest in building and deploying a new infrastructure

capable of efficiently supporting these new workloads while reducing the cost of operations. This is a critically important component of an IT strategy aimed at shifting budget away from 1st and 2nd Platform maintenance and into 3rd Platform innovation. IDC believes that in doing so, IT will need to be transformed into a strategic delivery organization optimized to deliver critical services to the business faster and with a higher service-level agreement (SLA). The goal is the delivery of mission-critical availability and business continuity services to the business.

Applications Are Redefined

It has been said that "data" is the new oil, and companies are looking for new ways to leverage insights from ever-growing datastreams in order to differentiate themselves in the market. Enterprises are looking to extend their mobile engagement model and leverage new Internet of Things (IoT) datastreams emanating from the edge by building new cloud-native applications. These next-generation applications are defined by the new digital transformation needs of the business. Cloud-native applications typically leverage new DevOps development processes aimed at accelerating the development cycle and speeding deployment for a competitive edge in the marketplace. These applications are typically componentized, stateless, and horizontally scalable. In short, they are fully abstracted from the underlying hardware resource layer.

The next-generation cloud-native applications and their associated data services described previously do not require, nor do they assume, any resiliency from the core infrastructure that sits underneath them. This is a big departure from traditional 2nd Platform systems where core hardware and system software elements were carefully tuned to operate together from the silicon layer up through the firmware and into the operating system. Once the applications are redefined in this way, the development teams will increasingly define performance, availability, and scale requirements for the infrastructure team. IDC believes these redefined applications will change the type of infrastructure required, as well as the location of the infrastructure deployment, because infrastructure will increasingly extend from the edge to the core and out to the cloud.

IT Transformation

The infrastructure sitting underneath the new next-generation applications needs to be agile and scale on demand. At the same time, they need to support existing 2nd Platform or traditional workloads side by side with cloud-native applications. The goal of this new software-defined hyperconverged infrastructure is to enable IT to better control costs by better matching available resource capacity with the needs of the applications running on top. This services-based approach to infrastructure allows IT to reduce capex and better manage opex at the same time.

IDC believes that the data landscape is evolving in such a way that traditional infrastructure may not be able to keep up with the new workload requirements. As social and mobile usage continues to grow, and IoT machines at the edge generate more semistructured data, workloads will increasingly need to run where the data is located. These geodispersed data sets will require geodispersed workloads, and these applications will need to gain location awareness as well. At the same time, software-defined converged infrastructure will increasingly see the CPU and data storage elements of the system become increasingly aligned.

Software-defined converged infrastructure effectively decouples server hardware design from workload resource requirements, allowing for open, elastic infrastructure operations. In a software-defined environment, virtualization software first abstracts existing hardware into virtual resource pools of compute, memory, I/O, and/or storage, and then reaggregates the infrastructure as code based on the resource requirements of the workload by using predetermined performance profiles. Looking even further into the future, IDC believes that disaggregated system designs will emerge that remove the first step in the software-defined infrastructure (SDI) model by providing the infrastructure with disaggregated pools of physical resources.

Once the industry realizes this vision, we will have a true infrastructure defined in code that will allow for the support of traditional legacy and emerging cloud-native workloads side by side. As this transition develops, the need for dedicated fixed-use workload hardware will become less relevant. Where we once referred to servers that were defined by sheet metal enclosures or special-purpose chassis, we will begin referring to systems that are defined and optimized at a broader rack level of architecture. As this infrastructure model emerges in the marketplace, additional hardware functionality will be embedded into the system, and software will define the behavior of converged resources going forward. Figure 2 provides a look at the benefits IDC sees with customers' transitions from traditional to software-defined converged infrastructures.

FIGURE 2

Benefits: Agility, Speed, and Costs
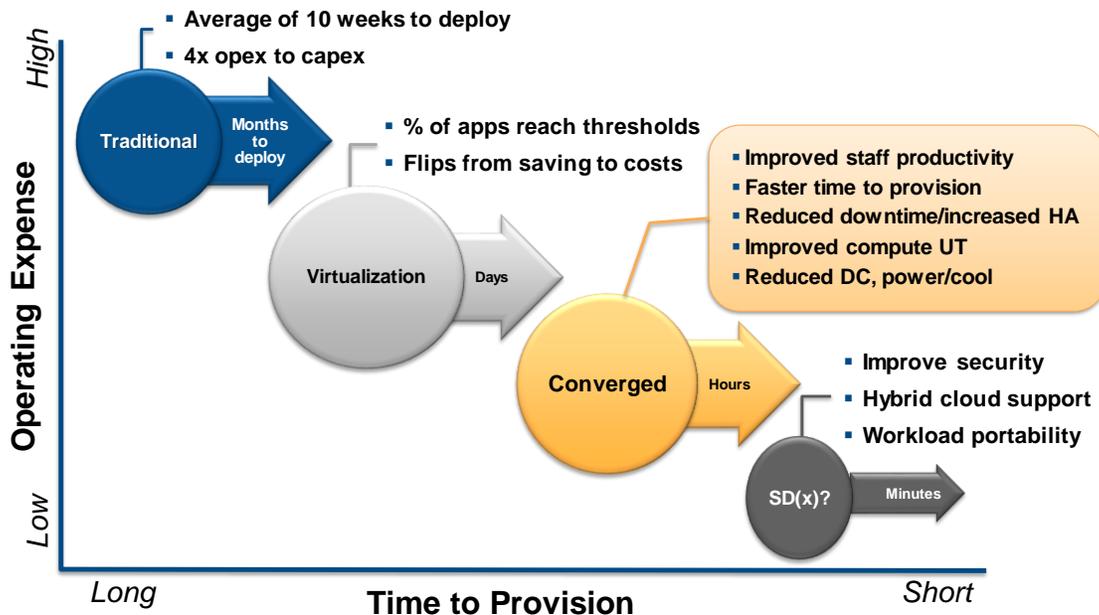
Source: IDC, 2016

All this may feel disruptive to existing and proven datacenter infrastructure models, but IDC believes it is important to begin planning for this transition now. Rapidly growing streams of data from customers and prospects become the basis for differentiation in the marketplace. In effect, data becomes the new oil and every business becomes an IT business at the core or risks failure. As this plays out, increasingly standardized servers will absorb functionality in the form of software from adjacent storage and networking infrastructure. Abstraction technologies will make it possible to define each workload in an insulated manner. While hypervisors will play an important enablement role, IDC believes that container technologies and microservices will also be widely embraced. As this occurs, software-defined converged technologies will be required to move the infrastructure forward. And of course, workloads will evolve to deliver the same functionality currently being delivered by appliances via software running on converged infrastructure.

Dell EMC Solutions

Dell EMC recognizes that while customer needs may vary widely based on organizational size and workload requirements, converged systems and hyperconverged architectures are increasingly the desired infrastructure solution. Today's IT is a combination of new applications designed to power increasingly mobile customer engagement and traditional workloads designed to help the business operate effectively. Cloud-native workloads typically involve distributed or scale-out applications where the required resiliency resides in the application while traditional workloads generally include client/server and scale-up applications where resiliency is provided by the infrastructure itself. Dell EMC believes that, as a result of inherent interdependencies, these applications often need to live side by side on the same core infrastructure. As a result, Dell EMC converged infrastructure solutions are engineered, manufactured, managed, supported, and sustained as one extensible set of offerings:

- **Engineered:** Several hundred Dell EMC engineers work to standardize datacenter architectural design, system design, and complete life-cycle management. The goal is transferring the burden of planning, integrating, and managing converged infrastructure away from the customer so that the customer can focus on innovating its applications and data strategies.

- **Manufactured:** Dell EMC operates sophisticated converged systems manufacturing facilities optimized to build infrastructure to the same standards globally.

- **Managed:** The Dell EMC vision is integrating architecture standards, designs, and configurations into software to provide a converged infrastructure with validated life-cycle management capabilities.

- **Supported:** Dell EMC support includes full accountability for converged infrastructure with expertise in systems design, which includes the integration of key components.

- **Sustained:** Dell EMC provides life-cycle assurance across its converged portfolio — which includes VxRail, VxRack, Vblock, and VxBlock Systems — by providing a comprehensive set of architected, designed, validated, and documented standards called Release Certification Matrix (RCM).

Organizations of all sizes are looking to deliver new levels of efficiencies in their traditional 2nd Platform environments while accelerating the deployment of 3rd Platform engagement and advanced analytics necessary to move the business forward. As a result, Dell EMC believes that both cloud-native workloads and traditional workloads will often need to reside side by side on the same converged infrastructure. And because the size and deployment requirements are often so different, Dell EMC offers multiple infrastructure deployment and purchasing options with its converged infrastructure (see Figure 3):

- **3 engineered solutions stacks:** This option is designed to simplify the customer journey to native hybrid cloud, big data, and enterprise hybrid cloud stacks.

- **Multiple ways to buy:** To best meet evolving capex and opex requirements, organizations are looking for choice in how they buy, including on-premises/off-premises and customer/service provider-run.

- **3 types of converged systems:** Dell EMC offers appliances, racks, and blocks.

- **2 types of integration layers:** Converged infrastructure can be deployed at any scale while simplifying management by leveraging Vscale fabric for datacenterwide connectivity and Vision software for complete transparency into infrastructure health and interoperability.

FIGURE 3

Use Cases Dictate Solution Approaches
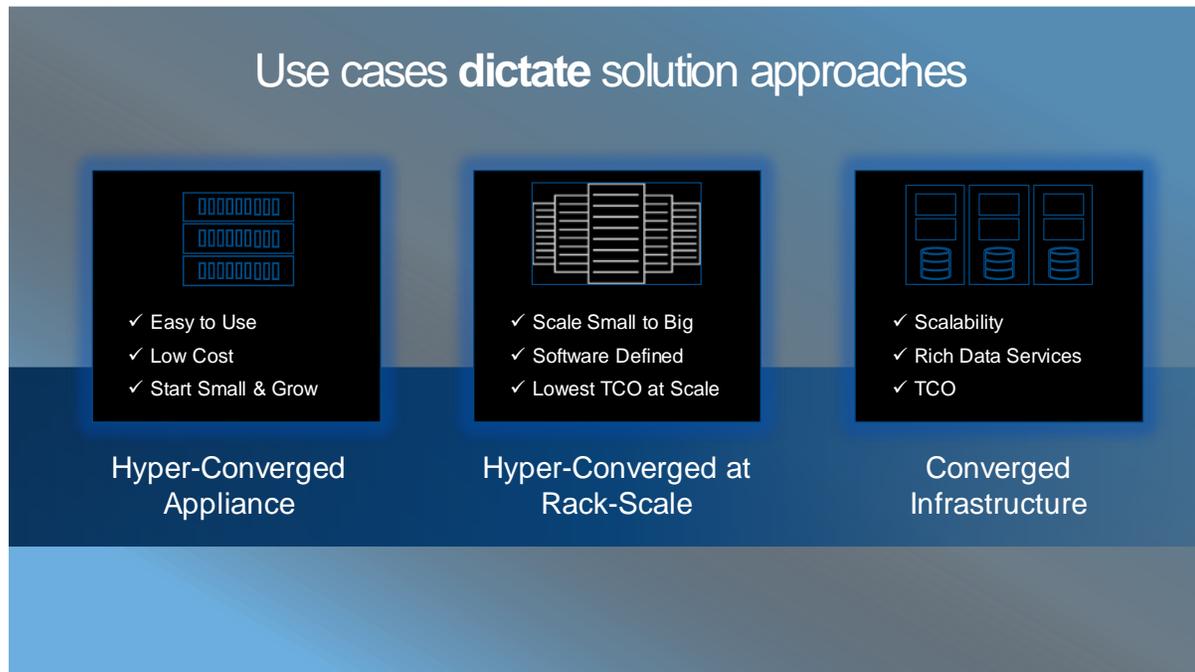
Source: Dell EMC, 2016

Challenges

As separate companies, Dell and EMC developed and continually evolved their converged offerings as the market emerged and grew. As the workloads landing on converged systems have become more sophisticated, purchasing requirements have evolved. For example, customers are putting simplicity and ease of deployment front and center as they look for a transformative experience in the datacenter. IDC believes that as a combined company, Dell EMC must focus on how it can bring together Dell's modular server technology road map with EMC's software-defined storage portfolio and extend VCE's converged infrastructure offerings to meet the shifting workload needs in the marketplace. IDC recommends focusing on the business value derived from software-defined converged systems and articulating a marketing message that encompasses the full offering, including products, services, and financing across Dell EMC's portfolio. Finally, this messaging needs to be customized both for very large enterprise customers more typical of EMC's customer base and for the commercial midmarket and small enterprise customers more common in Dell's account base.

Recommendations and Conclusions

The 3rd Platform impacts core business models, applications, and infrastructure, and all three areas are undergoing historic change. One thing is clear: IT and the business cannot continue to rely on the technology advancements of the past. IDC believes that IT leaders need to start transforming their datacenters today in order to prepare for these increasingly digital business models. This is an exciting shift, and it will place IT at the forefront of a number of decisions aimed at transforming business processes and operational efficiencies. Accordingly, it is critically important for CIOs and senior IT leaders to develop strategic partnerships with the business. If this is done effectively, the risk typically

associated with innovation becomes a shared risk. And the structure of the IT organization and the skills present in the IT organization are critically important components of how innovation will be driven into an increasingly digital business. For these reasons, IDC believes that IT will assume a critical role in the forthcoming digital reinvention as IT positions itself as a business innovation platform.

By separating the operational component of an IT infrastructure and building a true shared services delivery center, IT will be able to focus on innovation in applications and data without the burden of a legacy infrastructure. IT leaders need to understand that infrastructure consumption and delivery models are changing as the focus shifts to delivering outcomes that positively impact the organization. Traditional information technology and specialized operational technologies typically embedded at the edge will merge, and this combination will drive an infrastructure transformation that will extend from the edge to the core datacenter and out to the cloud. We will increasingly live in a world that leverages a hybrid cloud model to process the vast amounts of data necessary to successfully transform business digitally.

When planning for the future, IT organizations need to remember that datacenter workloads represent a critical pivot point impacting infrastructure decisions at the edge, at the core, and in the cloud. This is an important consideration, particularly when contemplating the impact that next-generation cloud-native applications will have on infrastructure. IDC believes that IT organizations need to think about IT as a financial asset and not as a cost center. And when doing this, they must consider a software-defined converged infrastructure, which can help drive utilization rates higher and lower capex while automating operations to achieve cloud-like operational costs.