White Paper

Dell EMC: Navigating the Journey to IT Transformation

Cloud and Converged Infrastructure

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Introduction: Digital Transformation Takes Center Stage

What Exactly Is Digital Transformation—and Why Is It So Important?

Digital Transformation is the reinvention of business activities, processes, competencies, and models that fully leverage current and future digital technologies. In today's dynamic business environment, organizations across the board are tasking IT to accelerate efforts to deliver a unique and compelling customer experience. At the same time, IT organizations are adopting new approaches in order to better serve organizational goals. Organizations are adopting cloud technology to drive agility, efficiency, and effectiveness to become more productive today, and to help ensure they can easily meet future objectives.

When IT becomes more effective, both the business and IT benefit by:

- Improving business results with better and faster access to information.
- Improving IT agility and flexibility.
- Reducing IT overhead.
- Delivering improved performance against SLAs.

How Can Organizations Become More Effective?

The path to greater effectiveness starts from the top down, focusing on how IT can best enable the entire organization to achieve its goals. This means focusing on actions and innovations that provide unique value to the organization. IT teams should start by understanding how IT can become more responsive and agile, spending less time on labor-intensive, routine tasks such installing, managing, and testing hardware. The process of becoming more effective is accelerated by adopting cloud technology (both inside and outside the four walls of IT) to enable IT Transformation.

IT Transformation

IT Transformation is the process of adopting new approaches to better support digital Transformation. It is through IT Transformation that the IT organization will become both a business enabler and accelerator. IT's Transformation journey involves new approaches for people, processes, and technologies. Most organizations are adopting some combination of cloud technology—on-premises and off-premises, and IaaS, PaaS, or SaaS. In fact, many successful organizations use more than one type of cloud solution. And, one reason that public cloud solutions act as an accelerator is because there is no 'creation and curation overhead.' The requestor simply needs to provide a credit card, and the system is up and running—someone else does all the work to ensure the pieces work well together.

IT Transformation Leads to Improved Business Outcomes

In recent ESG research completed on behalf of Dell EMC, ESG surveyed more than 1,000 IT decision makers at enterprise organizations around the globe, and created an IT Transformation maturity model to assess the relative progress organizations have made on their IT Transformation journey.[1] The differences in the business outcomes reported by organizations that had achieved a higher level of IT Transformation compared with those lower on the IT Transformation curve were striking:

[1] Source: ESG Research Insights Paper, *How IT Transformation Maturity Drives IT and Business Outcomes*, April 2017.

- Almost all respondents (96%) working at organizations that had achieved the highest level of IT Transformation reported their organization had exceeded its annual revenue goals for FY2016. By contrast, only 44% of respondents working at organizations segmented in the lowest tier of IT Transformation maturity reported the same success.

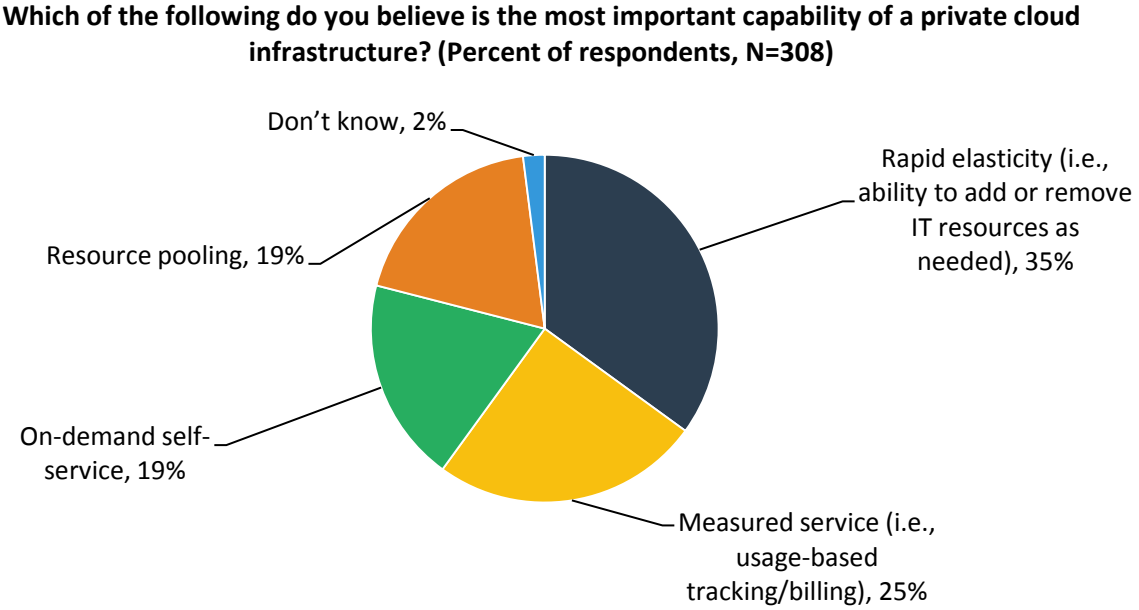
- Furthermore, 85% of respondents working at fully transformed organizations reported they felt their organization was in a very strong, or strong, position to compete in its market over the next few years. Just 43% of respondents working at organizations with predominantly legacy-based IT technologies felt the same level of confidence.

This data shows a clear correlation between the level of IT Transformation maturity within organizations, and their current and ongoing business success.

Embarking on the IT Transformation Journey

Many IT organizations have come to the realization that in order to fully reap the benefits of on-premises cloud technology, they cannot continue to build from scratch with any type of efficiency. Cabling, installing, integrating, upgrading, testing, maintaining, patching, etc. are all activities that dilute IT's main focus—to enable and accelerate organizational goals. That is why converged and hyperconverged systems are becoming an important component of private cloud infrastructures. In fact, according to ESG research, IT organizations adopting private clouds are seeking to modernize and automate IT to realize the same benefits they would receive if they moved to the public cloud. These benefits include rapid resource elasticity, usage-based tracking, on-demand self-service, and resource pooling, which are directly related to driving efficiency and agility in how IT delivers the services that can help IT accelerate along its IT Transformation journey (see Figure 1).[2]

Figure 1. Most Important Capabilities of a Private Cloud Infrastructure



Source: Enterprise Strategy Group, 2017

[2] Source: ESG Research Report, *The Cloud Computing Spectrum: From Private to Hybrid*, March 2016. All ESG research references and charts in this white paper have been taken from this research report unless otherwise noted.

Modernize, Automate, Transform

Without a clear understanding of what is involved *before* embarking on the IT Transformation journey, many organizations may perceive the journey as complex and fraught with challenges. While there are challenges, mapping out milestones will help present a realistic idea of the steps involved along the way. In essence, the IT Transformation journey comprises three basic stages: modernize, automate, and transform.

Modernize. Organizations must first *modernize* their infrastructure in order to deliver a flexible and efficient foundation. Most importantly, resource abstraction—including server, storage, and network virtualization or container technology—are core to enabling a level of infrastructure flexibility. This may seem fairly basic, given the fact that server virtualization has been around for a long time.

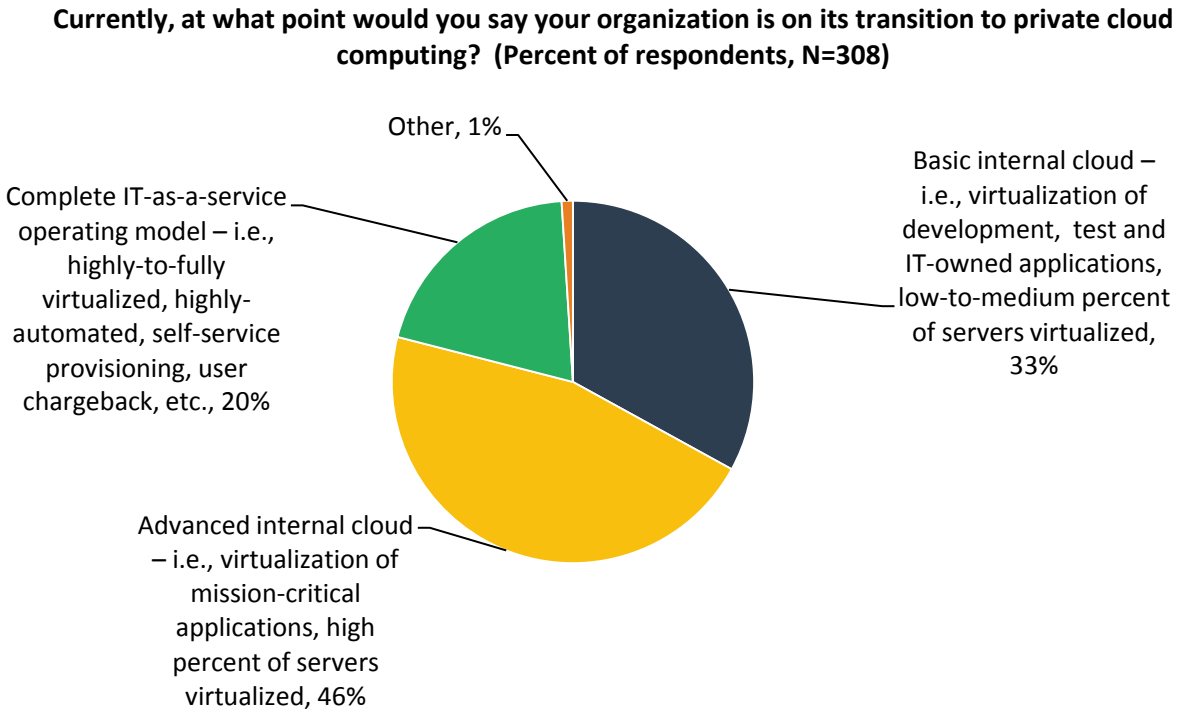
According to ESG research, one-third (33%) of IT professionals surveyed said their organization's journey to build a private cloud is still only at a very basic virtualization stage, with just a small percentage of applications virtualized. Two-thirds of respondents said their organizations have progressed beyond the basic stage and have built an advanced internal cloud, or are delivering full IT-as-a-service (see Figure 2).

To modernize their infrastructure, IT must move beyond server virtualization to storage and network abstraction. After all, a software-defined environment is key to resource optimization and elasticity. While many organizations begin with a build-your-own approach based on leading component technologies, others recognize the value of deploying a cloud solution built on converged infrastructure—one that accelerates their deployments. To support elasticity and agility, deploying virtualization on a converged or hyperconverged infrastructure system designed from the ground up, is much easier and more cost-effective than retrofitting an environment originally designed for single use cases—due to the fact that converged system vendors perform all the testing and patch management to ensure compatibility across components.

Deploying modernized technology is core to IT Transformation, and both converged and hyperconverged technologies play key roles. In order to be considered a transformed organization, approaches that lend themselves to driving IT agility, such as converged and hyperconverged platforms, are a "must have." Converged and hyperconverged architectures that scale out and up to meet varied application performance and throughput requirements accelerate resource allocation and provisioning. In ESG's IT Transformation maturity model research, fully transformed organizations, 100% of which reported their organizations use CI/HCI platforms to support applications, are 6x as likely to fulfill VM provisioning requests in under four hours compared with those at the beginning stages of the Transformation journey.[3]

[3] Source: ESG Research Insights Paper, *How IT Transformation Maturity Drives IT and Business Outcomes*, April 2017.

Figure 2. Stage of Transition to Private Cloud Computing



Source: Enterprise Strategy Group, 2017

Automate. The second stage of the journey is automate. To deliver IT-as-a-service, it is a requirement to *automate* IT operations. This entails full resource pooling, available on demand, with self-service and billing/chargeback—or at least showback/service consumption visibility, and governance. Transformed organizations are, by far, the most likely organizations in ESG's IT Transformation maturity model to have enabled users to provision IT resources in a self-service fashion. Nearly nine out of ten respondents (89%) report their organization offers extensive or established self-service capabilities to end-users.[4] This stage is heavily dependent on API integrations across the stack, in order to quickly allocate the right resources where and when they are needed, and to create automated workflows that support the business. According to ESG research, 20% of organizations surveyed said they are delivering full IT-as-a-service today (see Figure 2). While this appears to be a relatively small figure, the number is up from 11% of organizations delivering IT-as-a-service in 2014.

Regarding API integrations, converged infrastructure-based cloud solutions accelerate time to deployment by offering a pre-engineered, pre-tested means, which allow organizations to quickly deploy automated solutions for a variety of needs, e.g., workflow automation and orchestration.

Transform. This last stage of the journey may be the most difficult. *Transform* is about people and processes—ensuring IT is organized, has the right skill sets in place to be successful, as well as the appropriate workflows that leverage technology to accelerate the business. Most IT groups and workflows are organized to support a very traditional, relatively static, on-premises environment. As such, traditional IT has specialized roles mapped to the layers of the stack for servers, networking, and storage—with processes designed around those roles to accommodate the manual operations associated with using a do-it-yourself (DIY) stack. With the advent of new technologies, such as converged/hyperconverged systems and engineered cloud solutions, individual IT responsibilities, skill sets, and processes must change. By deploying hybrid

[4] ibid.

cloud on converged infrastructure, IT departments are able to transition resources from performing time-consuming, routine tasks to more proactive, value-added activities.

Several Routes to Infrastructure Modernization: The Build-to-buy Continuum

Organizations can take several routes to infrastructure modernization. These include:

- Build/do it yourself with best-of-breed components.
- Build reference architectures.
- Buy private cloud infrastructure building blocks.
- Buy a full integrated hybrid cloud stack.

Build/Do It Yourself (DIY)

Traditionally, the responsibility of building out an IT infrastructure has fallen on the shoulders of IT. IT is responsible for identifying the business requirements of the organization, and for determining—from an IT standpoint—how to meet those requirements.

One of the biggest questions IT must answer is, "What kind of storage, servers, and switches do I need?" That challenging query generally leads to additional questions, which relate to features, performance, compatibility, and cost. For large organizations, the purchasing responsibility often falls on multiple groups of people, requiring some level of coordination. This complex situation can result in long lead times, deployment delays, and configuration issues. There is also additional time and effort required to rack, stack, and test systems. Furthermore, there are lifecycle management responsibilities that IT must handle, such as ensuring compatibility between components and debugging system issues while upgrades are performed and capacity is added. There is rarely any unique value added to an organization through building, installing, testing, debugging, maintaining, upgrading, and scaling a DIY system.

It should come as no surprise that the bulk of installed IT infrastructure is DIY. This model has been around for many years, the technology and approach are well understood, and IT teams have been organized to support this model. Build/DIY still has a strong place in the world, since change is slow and the IT Transformation journey is long. Well-staffed organizations with available infrastructure resources are more inclined to follow a DIY path. Based on ESG research, more than half (57%) of IT professionals said that they still expect to be filling the majority of their on-premises infrastructure requirements with a DIY approach in five years.

Build Reference Architectures

Reference architectures (RA) help reduce the upfront effort of building an IT infrastructure. These architectures offer blueprints of a clearly defined set of compatible software and hardware for building out the environment. By following the blueprints and best practices outlined by their desired vendors, IT administrators can confidently build a solution that meets their requirements, whether for a specific mission-critical application, or for a mix of applications used by everyone in the business.

Reference architectures have paved the way for the rapid adoption of virtualization in many organizations that were initially slow to adopt. Although reference architectures help address some of the complexities of the build approach (specifically around initial interoperability), issues still exist because of multiple points of support, a lack of comprehensive

management synergy between components, and the need to maintain, manage, patch, scale, and test the individual components. As with basic DIY, lifecycle management falls on the shoulders of the IT team.

Buy, Rather than Build

Today, there are multiple ways to buy, rather than build, IT infrastructure. Organizations can opt to purchase fully configured, tested, plug-and-play infrastructure solutions, or they can opt into buying an entire cloud stack. Solutions in this category enable IT to become both a business enabler and accelerator by significantly speeding deployment and simplifying the IT environment.

Converged infrastructure brings together individual storage, networking, and compute resources into a fully pre-integrated, pretested solution. Converged infrastructure offers the benefit of allowing IT to get up and running very quickly. Lifecycle costs are reduced since the infrastructure is consolidated into a single system with fully integrated servers, storage, and networking, thereby eliminating the time and resources required to separately procure, deploy, manage, and maintain components. More comprehensive solutions even include data protection and disaster recovery options to further streamline data management. In fact, one of the main benefits of deploying a converged infrastructure is that the IT organization no longer wastes valuable time managing infrastructure subcomponents—a fundamental change that enables IT organizations to begin the *modernize* portion of the journey.

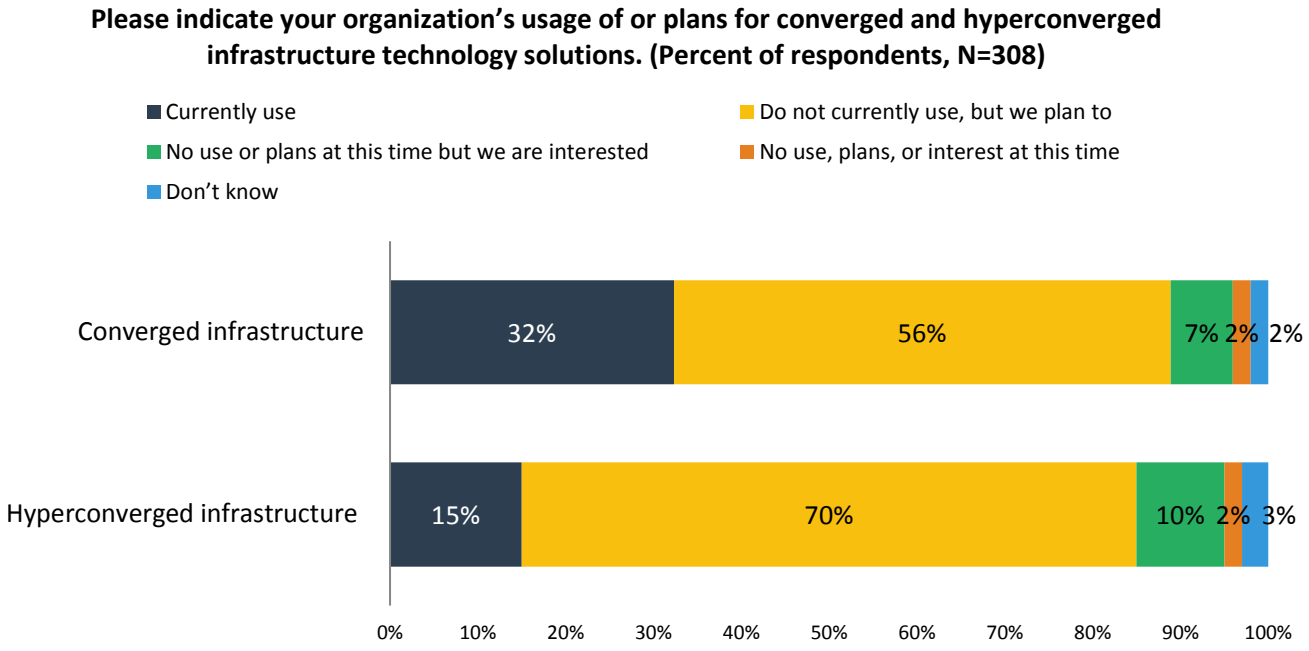
Management software can centralize and simplify routine tasks across the converged infrastructure solution. Lifecycle management is significantly streamlined by synchronizing and automating updates across various parts of the solution. Responsibility for patch testing falls on the converged system vendor, removing much of the lifecycle management complexity from IT. Simplified scalability enables increased capacity and performance with minimal impact to ongoing operations. The turnkey nature of converged infrastructure eliminates test and build, and reduces costs.

Hyperconverged infrastructure consists of software-defined, scalable nodes or appliances that combine server, storage, virtualization, and (sometimes) networking resources into a building block. This is possible due to the increased processing power of the latest enterprise-class servers, improved performance of flash storage, larger capacity spinning drives with smaller footprints, and fast networking for connecting nodes. By layering specially engineered software on top of these powerful servers, organizations can implement virtualized infrastructures at a lower cost than implementing 3-tier architectures. The server turns into an infrastructure building block, complete with virtual machines, self-contained storage, and an integrated management interface. Hyperconverged appliances deliver compute and storage (combined in an easy-to-use appliance form factor), offering the convenience of being able to start small with the flexibility (and cost savings) of a pay-as-you-grow model.

Converged and Hyperconverged Adoption

Deploying converged infrastructure helps organizations focus on value-added activities, which is a key goal of IT Transformation. Since converged solutions have been available for several years longer than hyperconverged solutions, it should come as no surprise that converged solutions have broader adoption today. According to ESG research, nearly one-third (32%) of IT professionals surveyed said their organization had adopted converged solutions, while more than half (56%) had plans to adopt. In addition, 85% of IT professionals indicated their organizations had adopted or had plans to adopt hyperconverged solutions (see Figure 3).

Figure 3. Converged/Hyperconverged Infrastructure Adoption Trends



Source: Enterprise Strategy Group, 2017

Benefits of Modernization with Converged Infrastructure

Organizations can realize significant benefits from the basic adoption of converged or hyperconverged technology. Adopters of converged and hyperconverged technologies report that one of the leading benefits is faster deployment time, with many also seeing improved service and support, better scalability, easier management, and overall reduction in the total cost of operations (TCO).

Purchasing a converged or hyperconverged system can result in cost savings from a number of areas. These include:

- Eliminating the time and cost of design, test, and build with a turnkey approach.
- Achieving benefits more swiftly with rapid deployment.
- Reducing lifecycle costs as the infrastructure is treated as a single system.
- Gaining simplified management, debug, upgrade, integration, regression testing, and patch management, as well as eliminating QA testing and the need to deal with firmware incompatibilities.
- Building on the savings achieved through infrastructure upgrade via automation through APIs, and integration with broader IT management and cloud frameworks.

Engineered Cloud Platform

It's essential for organizations to determine the level in the stack on which they want to focus their efforts. In fact, when ESG asked IT professionals responsible for their cloud and virtualization initiatives about their future plans for IT, more than half (58%) said they were planning for a hybrid cloud environment. Converged and hyperconverged engineered solutions

add tremendous value because they relieve the customer of the need to create and curate the virtualized infrastructure. As such, converged and hyperconverged solutions are a foundational element in hybrid cloud platforms. Dell EMC Enterprise Hybrid Cloud, and Dell EMC Native Hybrid cloud are engineered cloud platforms—turnkey, private cloud solutions. They are the private, on-premises (or hosted) portion of a hybrid cloud solution.

Dell EMC Cloud Solutions: Agility, Availability, and Compliance

Dell EMC offers a suite of solutions that can help accelerate the IT Transformation journey, offering full stack solutions to help IT adopt new approaches to better support digital Transformation. Engineered cloud platforms, such as Enterprise Hybrid Cloud and Native Hybrid Cloud, combine converged or hyperconverged infrastructure with the entire cloud software stack for a turnkey, on-premises cloud experience.

Dell EMC Enterprise Hybrid Cloud offers the software stack enterprises need in order to leverage cloud capabilities for their traditional applications. Native Hybrid Cloud provides a platform-as-a-service offering for those organizations that plan to go cloud-native.

Dell EMC was one of the first to deliver converged solutions, combining the separate elements of a traditional infrastructure (compute, network, and storage) in order to simplify management, increase performance, and reduce costs. Today, Dell EMC offers a number of converged and hyperconverged products, including:

- VxBlock converged system, optimized for a wide range of use cases, simplifying all aspects of IT by integrating compute, network, storage, and virtualization technologies.
- VxRail appliances, optimized for traditional and cloud-native workloads running on VMware, with integrated servers and storage.
- VxRack Systems, optimized for traditional and cloud-native workloads running in mixed environments when customers need hyperconvergence with the ability to scale beyond 64 nodes, with built-in rack-scale networking.
- XC Series Appliance, optimized for multi-hypervisor environments and broad workload support, offering enhanced network and security capabilities.

This broad portfolio of solutions enables Dell EMC to meet a wide variety of use cases—from demanding, highly scalable (rack-scale) workloads to next-generation cloud applications. Dell EMC is even able to support the DIY portion of the equation. That said, converged products are the starting point of an IT organization's digital Transformation. Converged and hyperconverged products (as in engineered solutions from Dell EMC) can provide more value to the business than can buying and building best-of-breed systems. Dell EMC solutions remove IT from the business of managing, maintaining, patching, and testing—freeing up resources to focus on value-added, strategic initiatives.

The Bigger Truth

Infrastructure modernization is the first step in the IT Transformation journey. IT strategy must shift from building out the many tiers of infrastructure and buying off-the-shelf applications, to buying solutions engineered on converged infrastructure so that IT investments can focus on building innovative applications—which differentiates the business and keeps it competitive.

Adopting cloud technologies provides a foundation for automation and transformation, enabling incredible business agility. Agility means no more bottlenecks when it comes to finding the IT resources to meet critical requirements. This also means that when an organization identifies a new opportunity to reach prospects, serve customers, or develop new products or

services—IT assets are adaptable to those new needs. It all begins with infrastructure modernization based on converged and hyperconverged technologies. These technologies bring together virtualization, servers, storage, networking, and software to speed deployment, while reducing lifecycle management and maintenance headaches. Organizations are able to drive cost savings by eliminating the need to source, build, maintain, and upgrade multiple components separately. The process is further accelerated by adopting turnkey, engineered cloud platforms to fully break down walls and leverage the appropriate resources to meet application requirements for consistent performance, availability protection, security, and compliance.

While this may appear to be a daunting journey—especially when trying to determine where to start—it doesn't have to be when using engineered cloud solutions. The payoff is worth the time and energy expended. When looking at those organizations that have achieved the highest level of IT Transformation, it is not surprising to see they have exceeded recent revenue goals, and possess a high level of confidence with regard to competing in the market over the next few years—further illustrating a definite correlation between the level of IT Transformation maturity within organizations, and their current and ongoing business success.

Dell EMC is a frontrunner in developing innovative technology and services solutions, offering new and original ways for organizations to streamline the journey to the cloud. Organizations considering a move to the cloud, and planning to take measured steps to achieve this goal, would greatly benefit from looking into Dell EMC's broad portfolio of products and services to enable and simplify the IT Transformation journey.

Enterprise Strategy Group is an IT analyst, research, validation, and strategy firm that provides actionable insight and intelligence to the global IT community.

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