

# SCALING UP TO DIGITAL TRANSFORMATION

BUILDING SOLUTIONS ON THE LATEST WORKLOAD-OPTIMIZED COMPUTE TECHNOLOGIES

## EXECUTIVE SUMMARY

Changing business cycles are driving more uncertainty as IT grapples with digital transformation and infrastructure modernization—keeping companies relevant by building an IT infrastructure for today, which is also adaptable for the future. But existing infrastructures cannot respond well to changes in the environment, scaling poorly to meet new challenges with resources that may not be properly skilled for these new environments. New workloads and deployment methodologies have created complications as businesses attempt to establish a more scalable business architecture that can anticipate and deliver on IT needs for the future. To do this, IT needs to choose platforms that have the performance to drive today’s applications, scalability to grow seamlessly, and adaptability for future needs. This strategy empowers agility, enabling applications to respond instantly to both sustained growth and rapid spikes without significantly changing the underlying resources. Maintenance and operations costs need to be minimized on these systems that also need to be flexible enough to handle future needs. A scalable business architecture is the only way for a company to stay ahead of the curve and capture opportunity without delay. The new platform refresh cycles are underway, making it the perfect time to assess architecture needs.

## TODAY’S CUSTOMER NEEDS

There is an old Greek phrase *panta rhei* meaning “the only constant is change”, but those who lived more than 2,500 years ago could not even begin to ponder the rate of technical disruption in today’s business environment. Enterprises are under more pressure than ever to deliver on digital transformation and infrastructure modernization against a backdrop of rapidly changing business needs. It is predicted that by the end of this year, [67% of the Global 2000 companies will have digital transformation strategies](#). Digitization, ecommerce, the Internet of Things (IoT), mobile technologies, and more are all shrinking business cycles, creating the need for more agile responses. Technology has changed the way business competes. To be successful, IT will need to empower the business to scale efficiently, profitably, and sustainably from the datacenter to the edge. Everything in the datacenter is moving towards flexibility and software definition, meaning that as businesses change their infrastructure they will need to depend more on industry-standard servers as their building blocks for digital transformation.

How value is delivered to a business is changing as digital transformation takes hold. The years of cost cutting and stale technology platforms cannot keep up in an environment where everything is information-driven and automated. IT can now harness real-time data and telemetry to bring more value to the decision making process, enabling better real-time insight. But to do that, the underlying hardware needs to change, because traditional systems are no longer up to the task. Unfortunately, 55% of companies say they must move quickly before digital transformation impacts them financially, and [59% of companies surveyed worry it is already too late](#). Businesses today must get in front of this transformational change or risk getting left behind.

Businesses must be more dynamic, as decisions need to be made in real-time, and employees at the edge need to be empowered with instant insight. Waiting hours, days, or weeks for reports that guide decisions is a luxury that is no longer afforded. For instance, a major retailer was able to use a Dell Hadoop big data solution to [engage shoppers while they were physically in the store](#), in real-time. This type of technology was unobtainable only a few years ago, but as more businesses move towards digital transformation, they will need to move their intelligence from after-the-fact to real-time to capture more opportunities. To respond to competition quickly and seize opportunity, a business needs agility.

A [recent survey of the Asia-Pacific IT sector](#) indicated that 55% expressed frustration with their current technology platforms. For most, operating current infrastructure inhibits real-time insight, because older, rigid systems are unable to handle rapid change. Too often, the scaling of these systems is awkward at best, as large, expensive, and time-consuming updates make it more difficult to react to opportunity. But even with the right systems, the human element of IT is also lacking, as the skills to better interact with the business and enable rapid change are not in the typical human toolkit of IT organizations. With the shift towards cloud technologies, a hybrid IT environment will be required, as some assets will continue to live in the datacenter while others may be moved to off-premises deployment.

Making the server purchase decision is no longer a technical decision. It has become a strategic business priority, as investments made in IT must support efficient business operations today and in the future. With platform transitions on the horizon, this is a perfect time for businesses to investigate how they can better align infrastructure during this collision of business and platform inflection points to maximize opportunity. The 2017 server platform transitions will be pivotal for IT as competition is accelerating, and

significant product changes in this transition are directly applicable towards driving the better outcomes that businesses are demanding.

## A SCALABLE BUSINESS ARCHITECTURE IS REQUIRED

Emerging use cases like cloud-native workloads and software-defined storage are joining workloads like virtualization that are boosted by open, scalable platforms. To be successful, businesses will need a comprehensive and innovative approach that addresses infrastructure differently. They will need a **scalable business architecture**.

The three primary ingredients of a scalable business architecture are **performance** to drive today's applications, **scalability** to grow seamlessly, and **adaptability** for future needs. These are needed not only to address today's complex workloads, but also to enable the business to be prepared for future needs.

### *PERFORMANCE TO DRIVE TODAY'S APPLICATIONS*

Making the decision to build a scalable business architecture begins with the performance of the underlying hardware. Both Intel and AMD are introducing new technology platforms built around their new CPU generations. The new processing options will be the starting point, as server vendors innovate their next generation of servers based on new performance vectors that are then amplified by other technologies like faster storage, I/O, and memory. These new levels of server performance will intersect the market at the same time businesses are making architecture decisions for the next decade for the explosion of data, new usage models, and greater connectivity. Workloads will drive different characteristics, so platforms will need the flexibility to address these different performance requirements. For instance, the in-memory databases of SAP HANA environments demand multiple terabytes of memory; not just any commodity server will be able to handle that workload. Because of the criticality of the data being held in an in-memory database, technologies like NVMe that provide persistence despite power events add additional integrity to the workload. For genomics workloads where massive I/O throughput is required because large data sets are being loaded and then manipulated by GPUs (instead of just CPUs), server platforms with a large number of PCIe x16 slots are better matched to the workload needs. In virtual desktop infrastructure, SSDs or NVMe can boost database performance considerably.

## *SCALABILITY TO GROW SEAMLESSLY*

In a scalable business architecture, platforms must now address all areas of the datacenter, scaling and adapting to the unique needs of individual workloads. The ability to both grow and shrink seamlessly will be essential. Some applications may continue to scale upward at a rapid pace, while other services are spun up for only a moment.

Scalability needs to be powered by an automation-heavy infrastructure that accelerates action and response, removing the largest impediment: human error. Human error is a leading cause for security gaps, with [37% of all security lapses tied to human factors](#).

With better tools and more granular adjustments that can be made, IT will be in a better position to fine-tune performance at both the hardware and software level. This is not to say that humans will not be required in such an automated world; but in that environment IT staff will be working directly with the business units to drive innovation, not manually typing arcane configuration commands. Maintenance, as well, needs to be optimized with a more operations-friendly profile that can anticipate and head off issues before they hinder growth. By automating processes, an enterprise can drive higher efficiency, which ultimately lowers their operating expense.

Converged infrastructure and hyperconverged infrastructure enable businesses to build their own infrastructure that can be more scalable and responsive. Vendors like Dell EMC are also delivering that level of scalability in pre-built appliances that can scale up with demands while providing significant deployment flexibility to get workloads up and running quickly.

## *ADAPTABILITY FOR FUTURE NEEDS*

To be adaptable, the scalable business architecture needs to be open and future ready. Openness implies the ability to easily manage and integrate using standard tools, scripts, and APIs, boosting straightforward support and service. This includes workload optimization that needs to happen in real-time, autonomously. Handling both existing and emerging workloads means that a scalable business architecture needs to be able to anticipate and absorb spikes in usage, with capacity on demand. Headroom will be needed for meeting future needs but with minimal cost and resource overhead.

The historic view of highly segmented stovepipes, where separate admins each work only in their domain using their own tools, is an antiquated relic that holds businesses back. In these environments, the focus is not towards business goals, but instead only to clear items from a queue with little or no tie-back to other functional areas. Should a

database underperform, it is easy to simply push the issue to the networking team, instead of working with them to understand / optimize transaction performance. To maximize adaptability, servers, networking, and even storage will be based on highly reliable standardized architectures that enable more commonality and transportability, both for components and management, with Linux being a considerable bridge between these former silos. A software-defined datacenter (SDDC) enables scalable, standardized platforms as the underpinning. It then administers a layer of virtualized services on top that can be modified quickly to provide the agility required to match changing environments of both today and the future. As server, storage, and networking begin to merge and overlap, they become pools of resources that automated tools can adapt into a software-defined datacenter.

A truly scalable business architecture is more than just agile and cost-effective platforms that scale seamlessly; there is also the realization that legacy workloads and equipment will not just disappear. There is no light switch transition in the datacenter—the move to a scalable business architecture is comprehensive, and IT will need to continue to keep the older technology running during this transformation. Any plans for future capability must be open enough to include existing workloads, as those may not change now and could continue for some time. Legacy systems should be evaluated for capability versus operating cost to determine if they will remain in place, have their workloads migrated to a more flexible platform (moved to a VM), or whether there is merit in re-architecting the application to a cloud-native solution.

## DELL EMC'S NEW GENERATION OF POWEREDGE SERVERS

2017 will see a major platform transition for server vendors. Dell EMC is refreshing its PowerEdge portfolio, which is the basis for building out all of its solutions that cover a broad range of applications and workloads. Dell is using the introduction of the new Intel Xeon processor Scalable Family to power new offerings that can be building blocks for both cloud-native and traditional deployments. The Dell EMC portfolio is not limited to simply a server line; it encompasses a range of technology components that are well integrated and delivered from a single vendor for ease of deployment and operation.

FIGURE 1: DELL POWEREDGE IN THE OVERALL PORTFOLIO



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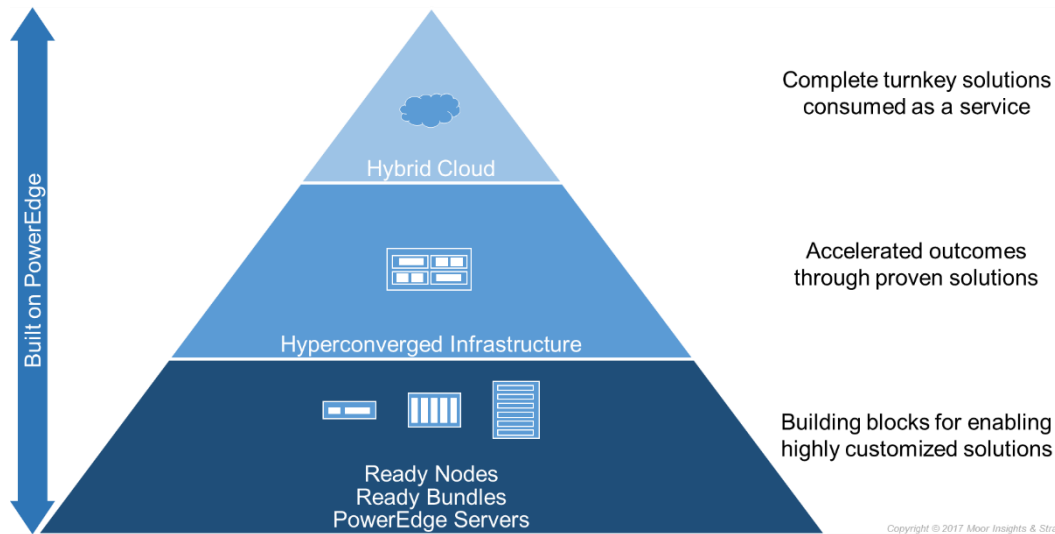
Dell EMC PowerEdge servers are the industry-standard building blocks for creating an agile SDDC that can scale up or down with the needs of the business. As a shipment leader in the x86 space, Dell EMC has the velocity and momentum to deliver across a diverse family of enterprise servers. These servers build the foundation for software-defined datacenters as their resources can be the building blocks for compute, storage, networking, and even converged infrastructure.

This latest PowerEdge generation includes the capabilities that IT will demand to address building a scalable business architecture. Some examples include:

- **Performance to drive today's applications** with up to 6x more Non-Volatile Memory Express (NVMe) low latency storage than the prior generation
- **Scalability to grow seamlessly** with one-click BIOS tuning for easier deployment of processing-intensive workloads and enhanced storage flexibility for more granular tailoring storage configurations to application needs
- **Adaptability for future needs** with increased GPU support (even in storage-dense configurations), FPGA support for specialized workloads, as well as broad support for 25Gb networking and remote direct memory access (RDMA)

New capabilities at the hardware level will enable the system to automate much of the optimization, for instance shutting down PCIe lanes that are not being used or optimizing airflow for cooling. Choosing the appropriate workload in the BIOS can automate much of the hardware configuration, which automatically selects the most optimized parameters. This one-click BIOS tuning enables an administrator to avoid lengthy testing, automating the task of selecting the optimized BIOS parameters based on the workload running on the server.

FIGURE 2: PLATFORMS TARGET IT & DIGITAL TRANSFORMATIONS



Source: Moor Insights & Strategy

The base of a scalable business architecture all starts with the server, as software-defined components will use servers as the building blocks. Dell EMC brings a wide breadth of solutions that empower IT, whether building to one's specific needs from foundational building blocks, building out an SDDC from highly integrated solutions like VxRack or VxRail, or building an enterprise hybrid cloud that combines on-premises compute with public cloud.

The key for Dell EMC is flexibility to meet the needs of any environment, including highly scalable workloads like hybrid cloud, private cloud, software-defined storage, Hadoop, high performance computing, and others.

## THE MI&S VIEW OF THE MARKET

We are now at a major inflection point in the market. Server vendors are delivering new server platforms based on the latest CPU technology, and this is occurring at the same time as IT is embroiled in how to digitally transform their businesses.

This scenario, where business changes end up driving datacenter changes, is a common theme that we see playing out every decade or so. From mainframe to minicomputers, minicomputers to x86, and then the move from standalone x86 servers to virtualization, each decade has brought a migration towards more flexible platforms, with better efficiency to accelerate decision making. Looking at the last transition, power / cooling (operating expense) drove the change, and x86 virtualization took hold as

everyone began testing and deploying virtualization. Fast forward 10-12 years and we now see almost every workload virtualized. To extrapolate the virtualization trend into today's terms, we are at the beginning of a new era. In 10-12 years from now, SDDC and digital transformation will be as common as virtual workloads are today.

The infrastructure choices businesses make will determine the winners and losers for the next decade. Infrastructure will matter, and building a scalable business architecture is the best way to deploy the next generation applications. Automation will be a key driver for a scalable business architecture, as smooth operation tied directly to the needs of the business will be critical. Infrastructure should be able to spin up or down in an automated way based on business needs, all without administrator intervention.

With digital transformations changing how businesses operate, two major trends will impact companies. First, the collection of data will increase dramatically as everything will be instrumented and digitized, putting a huge reliance on storage as part of any solution. Second, compute will increase along the edge, so that it is closer to the data being generated. This will require different types of platforms: more flexible and hyperconverged platforms with [larger and higher-performing memory subsystems](#) to handle the crush of information.

Public cloud will continue to be a viable deployment model for some applications, primarily software as a service (SaaS) and less differentiated horizontal workloads like test/dev and infrastructure. Workloads that define the business—the high value vertical applications or those containing confidential / sensitive data—will remain on-premises. Not everything can move to a public cloud, and each day sharpens the understanding that more IT deployments will be on-premises. Hybrid IT will be the *de facto* deployment strategy. It is simply unrealistic, except for very small businesses, to have an IT footprint that does not include a healthy dose of on-premises infrastructure.

## CALL TO ACTION

To truly excel in these changing times, a company needs a scalable business architecture that can deliver agility, help maintain a low-cost profile for maintenance and be future ready to protect the enterprise against technology and business disruptions. Dell's new PowerEdge portfolio is targeted at these types of businesses, those who are either heading towards a digital transformation or looking to significantly modernize infrastructure. There is a concerted focus on agility in these new products that enables them to scale both up and down, as business needs dictate, creating a scalable business architecture.



Based on the dynamics of the current market, we believe that Dell EMC, [as the #1 server vendor in shipments](#), should be a top consideration as IT looks towards choosing a server platform standard for the next few years.

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