How Dynamic Infrastructure Accelerates Business Innovation: Kinetic Infrastructure and Dell EMC PowerEdge MX

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Introduction

Disruption is the New Business Reality

Disruption is the name of the game in today's business world. Disruptive innovation is happening across industries, affecting everything from retail to finance to manufacturing. Nimble and fast-moving companies are innovating by changing their business models – impacting many companies with traditional enterprise data centers and slow-changing business models. Businesses can't avoid being upended by this phenomenon: Organizations of every size and in every geographic region worldwide are experiencing the effects of disruptive innovation.

A 2017 survey of more than 4,000 global CIOs by KPMG ["Navigating Economic Uncertainty"] found that more than 60% of respondents said they are feeling the dramatic effects of business and economic uncertainty. These technology executives made it clear that they are looking for consistent and reliable systems platforms that can support new applications and a flexible IT infrastructure. More than 50% of respondents want to leverage IT to become more innovative -- and nearly half wanted to find ways to achieve these goals within current budgetary constraints.

Some business leaders fear disruption; however, new technologies and delivery platforms give established organizations the ability to build upon their IP and to grow at an explosive rate. Businesses that transform their IT infrastructure can help accelerate innovation and create an underlying environment that can scale with the business. Hardware must support increased business demand for detailed analytics and actionable data-based insights. Applications must be able to scale up, adding more compute and storage resources. Businesses must have IT management solutions that deliver a unified view across the organization.

This paper provides an overview of the changing dynamics in the business world that demand a new approach to IT infrastructure. It provides a perspective for business managers and executives who are looking for a way to align business and IT by facing the challenges of disruption for better business outcomes. We will discuss the Kinetic Infrastructure from Dell EMC, which is designed to support IT flexibility and business agility. In addition, we will describe the first implementation of kinetic infrastructure on the Dell EMC PowerEdge MX system. The paper will explain how Dell EMC is helping businesses to rethink their data center architecture and accelerate their path towards more agility.

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Breaking Down IT Silos That Slow the Pace of Business Change

Nimble, born-on-the-web startups are entering established industries around the world. These startups are redefining the rules by which business is conducted. To respond to rapid change, established businesses must rethink the way they deploy their IT systems. Each technology silo has its own hardware and software, along with its own management software. For many organizations, it's difficult to deploy new infrastructure that can connect the silos—and to scale compute and storage rapidly, or easily.

Unplanned, reactive IT spending creates complexity in the data center. Costs associated with inefficient operations can rise dramatically. It is difficult to create hardware and software platforms that can help the business grow and innovate when teams are continually responding to crises. To grow and create new offerings, organizations want flexible IT systems that support greater business agility. These companies need a unified view of all systems under management – and simplified ways to monitor and control systems, reducing the need for specialized training to manage those systems.

Two Imperatives: Achieving IT Stability and Business Agility

IT priorities must align more closely with business priorities. Modernized IT needs to be able to provide stability and reliability for a wide range of workloads – traditional and new. Traditional enterprise applications will need to be carried forward, but they must run faster on platforms that support IT flexibility. Importantly, applications and data must be secure and operate consistently to avoid costly downtime that would hurt the bottom line and diminish a business' reputation with customers and partners.

At the same time, a new set of cloud-inspired transformational workloads is changing the way organizations do business. Data-intensive workloads like artificial intelligence (AI), machine learning (ML) and deep learning consume storage and compute resources in new ways. These workloads will need faster interconnects, larger memory and more storage to handle the large datasets being processed.

That is why data centers based on the principle of IT flexibility will allow businesses to adapt to changing business conditions. Transforming IT infrastructure brings better results for many innovative companies. These organizations can quickly match hardware resources with business needs. This approach gives their systems the ability to scale up as demands increase, enabling the business to become more agile.

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How Companies are Building a More Dynamic Infrastructure

Today, data center infrastructure – compute, storage and networking – must become more flexible to deploy; more scalable to meet new demands; and more efficient to serve ever-larger groups of end-users and end-customers.

Customers need a unified, manageable IT infrastructure that allows them to:

- **Break down silos to speed up the pace of change.** The IT silos found in many data centers must be replaced by a more flexible infrastructure that has the capacity to supply compute and storage resources, as needed. Combining compute and storage resources within a single system chassis brings valuable IT resources closer to the applications you need to run your business. This approach provides a unified infrastructure, inclusive of compute, storage and networking.

- **Pool resources for compute, storage and networking that can be provisioned, as needed, to fulfill business demands.** Older approaches to capacity planning and 1:1 replacements of siloed systems take more time to plan and accomplish. Customers who want to transform their business can achieve more efficient, pressing IT objectives by tapping flexible systems, on demand. They want faster compute, storage and networking resources for their systems, resulting in greater efficiency and scalability for growing workloads.

- **Make management of the infrastructure simpler and easier.** Many customers use dozens of software tools to monitor and manage data center operations. They should be able to view all systems under management through a single pane of glass – and to leverage automation to control systems resources. This automation and built-in management allows administrators to manage compute, storage, and networking more easily than they do today – and to make changes more quickly.

Customers expect that they will be able to use their new systems for many years. That's why systems that scale to meet business demands must support a useful lifetime of many years of updates for processors and on-board storage resources. This multi-generational approach to system lifecycles helps organizations to protect and extend their infrastructure investments.

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Kinetic Infrastructure

The Key Tenets of Kinetic Infrastructure from Dell EMC

Dell EMC is introducing a flexible and scalable solution called kinetic infrastructure. The building blocks of the Dell EMC approach to kinetic infrastructure – cores, DRAM, storage class memory, accelerators, storage and networking -- can be disaggregated, and re-aggregated, as workload demands change. It frees up the trapped potential of otherwise underutilized IT components by making better use of trapped computer and storage capacity via disaggregation. This approach to

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scaling infrastructure meets growing business demands by supplying resources, as needed, rather than requiring costly replacements of aging hardware that cause downtime.

The guiding principle of kinetic infrastructure is to enable digital transformation through the use of flexible IT systems. New systems must dynamically respond to changing business needs by tapping shared pools of disaggregated compute, storage and network fabric. Importantly, kinetic infrastructure supports a changing mix of workloads – which is vital to modern enterprises changing their business model.

By adopting kinetic infrastructure, management complexity is reduced by providing a unified view of compute and storage resources. Making management simpler and easier to operate brings several benefits: faster IT response to changing business conditions; less effort to change infrastructure; and, better cooperation and coordination among IT personnel supporting a large number of IT teams who work within the business units.

Kinetic infrastructure from Dell EMC has three key tenets:

- **Flexible architecture:** Computer systems need to scale out as they grow, adding resources when the peaks of the business cycle hit the enterprise data center. The ability to add resources, as needed, when business demands grow, avoids the need to continually reconfigure systems or replace them. The scalable fabric adds compute, storage or networking resources, as needed – preventing downtime associated with system replacements. The ability to add storage in a granular manner means that the data center is right-sized—rather than overbuilt to handle peak loads.

- **Agile Management:** Increases team effectiveness by accelerating data center operations. It does this by providing unified control, simplified administration and intelligent automation. This approach to managing large numbers of systems, storage devices and networking switches improves productivity and eases training requirements for IT personnel. Agile management improves availability of business applications and business data – supporting business processes more effectively.

- **Responsive Design:** This approach to system design lengthens the useful product lifecycle following installation of a new server. By adding resources, over time, the system becomes multi-generational – spanning the useful lifetimes of two or more servers that would otherwise have been required to meet the same business needs. This forward-looking design principle results in better return on investment (ROI) for the business or organization that relies on its systems to power the enterprise.

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Dell EMC PowerEdge MX

Dell EMC PowerEdge MX is the first implementation of Dell EMC kinetic infrastructure. The new systems are the realization of kinetic infrastructure, providing a platform for flexible IT. They respond to changing needs with shared pools formed from disaggregated cores, DRAM, storage-class memory, accelerators, storage and networking fabric. This pooling capability allows resources to be tapped quickly and easily.

Ultimately, IT leaders are looking for new systems that can provide them with the scalability available on a public cloud with on-premises speed, reliability, and security. Systems that do not provide both capacity and flexibility will not be able to support all workloads – both traditional and new workloads – that are the backbone of the modernized data center.

Growing the Business with Flexible IT

The PowerEdge MX is designed for IT flexibility. It is housed in a 7U chassis that provides headroom for the addition of faster processors and dense storage capacity, as demand for IT grows over time. It has compute sleds and storage sleds that slide into the system's integrated chassis. This makes upgrades quick and efficient, and avoids time and costs associated with frequent replacement of older systems just to gain more capacity.

The design of PowerEdge MX allows organizations to extend the useful lifespan of their server systems. PowerEdge MX customers will be able to update their systems with new generations of processors and memory that can be added, via compute sleds that slide into the system chassis. Likewise, customers will be able to add flash storage as demand for more capacity is required. Applications will be able to scale up compute and storage resources inside the PowerEdge MX chassis without facing a complete replacement of systems to support each jump in processing capability. This ability to adapt the hardware to meet future workload and business requirements allows PowerEdge MX to be expanded over multiple years, without reconfiguring or re-installing the system.

Storage Density for Data-Intensive Applications

Dell EMC is providing high-density storage inside the PowerEdge MX integrated chassis. It is essential that these storage resources are secure and resilient for data protection purposes and system availability. PowerEdge MX has granular storage management capabilities. The granular storage maps individual drives to individual servers – and storage can be shared by multiple servers – providing the correct storage ratio needed for a specific workload. Flexible additions of storage allow customers to add solid-state flash or hard-drive resources, as needed.

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Security and data protection are a top priority for business managers and CXOs. Any major security breach will tarnish a business' reputation – and it may take years to regain customer trust following a major breach or cybersecurity attack. PowerEdge MX supports FIPS-level security and the European Union's General Data Protection Regulation (GDPR).

Scalable Fabric and Fast Networking Interconnects

New technology that supports powerful processors, processing large data-sets in dense storage media, need high-speed interconnects to transfer data quickly and efficiently. This is particularly true for data analytics, which typically work with large datasets to produce actionable insights based on that data. For that reason, and for seamless scaling, PowerEdge MX supports PCI-e Gen 4, 25/50/100 Gigabit Ethernet, Fibre Channel over Ethernet (FCOE) and other fast networking interconnects.

Managing Systems for Business Agility

PowerEdge MX runs the Dell EMC OpenManage Enterprise Modular (OME-Modular) Edition management software, which is key to the way PowerEdge MX is monitored and managed. OME-Modular provides a unified view of all system resources under management. The OME-Modular monitors and maintains a management plane that reaches groups of chassis across data centers, reducing repetitive tasks that might lead to operational errors and unplanned downtime.

With multiple options for at-the-box management – wireless, touchscreen LCD and traditional crash-cart, OME-Modular supports ease of use, allowing more IT roles to participate in system management. This simplifies administration, improving coordination across IT teams working with the systems. The intelligent automation built into OME-Modular reduces the time and effort associated with controlling and managing scalable systems and large-capacity storage.

Flexible management supports increased business agility. It improves team effectiveness through easy-to-use, single pane of glass controls. This improves day-to-day IT operations by providing unified management of the PowerEdge MX compute, storage, networking and chassis resources.

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Summary: Deploying Systems That Meet Business Demands

Organizations need to have systems that are as dynamic and innovative as their business. To maximize the impact of capital investments, organizations need flexible systems that can grow with the business. By adopting a flexible infrastructure, the business can also reduce operating expenses by increasing system availability, and improving the productivity of the IT team.

Dell EMC is delivering a flexible IT infrastructure for the data center that allows CXOs and senior managers to try new business models that can accelerate revenue growth. The key tenets of kinetic infrastructure – flexible architecture, agile management and responsive design – allows systems to add compute, storage and networking resources, so the business can respond quickly to changing conditions. Kinetic infrastucture from Dell EMC enables a more unified alignment of IT and business over a traditional, siloed data center infrastructure.

Kinetic infrastructure from Dell EMC is designed to protect infrastructure investments through the use of a multi-generational, expandable system platform. PowerEdge MX, the first implementation of kinetic infrastructure has the built-in capacity to expand resources after they are installed in the data center. Customers will preserve ongoing IT operations and improve business agility by avoiding complex and costly system upgrades. The flexible resources of PowerEdge MX will allow the system's on-board processors and storage to keep pace with the growing demands of the business.

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