WHITE PAPER

Dell's Versatile PowerEdge Server Portfolio Accelerates Workloads and Innovates Server Management

Sponsored by: Dell

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EXECUTIVE SUMMARY

The brisk adoption of mobile, cloud, social, and big data technologies — what IDC calls the 3rd Platform — is changing the dynamics of IT datacenters and workloads. Companies increasingly need servers that can deliver faster application performance, provide better availability to meet stringent SLAs, and handle complex and evolving workloads as they maximize operational efficiency.

Server solutions must simplify management throughout the life cycle, automate maintenance tasks to improve IT efficiency and reduce downtime, and offer new storage innovations within the server to optimize the performance of demanding applications such as big data and analytics.

Dell is introducing the next generation of PowerEdge servers to meet these needs. The company is designing its servers to:

- Accelerate application performance with new flash designs and internal data tiering
- Simplify systems management operations with new levels of automation and embedded intelligence to enable faster delivery of workloads and improve IT efficiency
- Deliver the versatility required to address the widest range of enterprise applications for customers of any size

IN THIS WHITE PAPER

This IDC white paper examines the changing dynamics of IT datacenters and workloads and how companies require servers that can deliver faster application performance, provide better availability to meet stringent SLAs, handle complex and evolving workloads, and maximize operational efficiency. It highlights how competitive pressures are forcing companies to look to IT in order to differentiate themselves in the marketplace with solutions for cloud, mobility applications, and real-time data analytics. This white paper also outlines how Dell is delivering improvements in application performance, datacenter efficiency, scalability, and simplified, more automated management.

SITUATION OVERVIEW

Economic Challenges in the Datacenter

Enterprises are moving to the 3rd Platform in large numbers, seeking to leverage mobile, social, cloud, and big data solutions to gain competitive advantage. But the concept of "do more with less" remains ever present in datacenter operations. According to IDC research, constrained budgets are still a primary challenge facing IT organizations, even as new services are delivered and more users are supported internally and externally. As IT departments build out new capabilities, they're also challenged to be cost competitive with third-party options such as public cloud services.

IT executives need more intelligent systems that can ease budget challenges and deliver on 3rdPlatform initiatives, whether it's deploying mobile applications, leveraging social media to connect with customers, or collecting new data streams for analysis and implementing data analytics for quicker and more informed business decisions.

Businesses Need Faster Delivery of IT Services

As the pace of business accelerates, companies expect IT to keep up. Customers expect quick delivery of the company's services and products; internal business units expect near-immediate access to applications and data. The expectation of faster time to delivery ultimately falls on IT organizations.

An IDC survey of IT customers found the average time to delivery of new IT services is approximately six weeks. Without any improvements to the systems, these same customers expect delivery times to increase in the future because of the greater number of users and the increased complexity of applications. Organizations are using virtualization and improved management platforms to accelerate the time to provision services, but smarter servers with built-in automation and enhanced management can also simplify the deployment and provisioning.

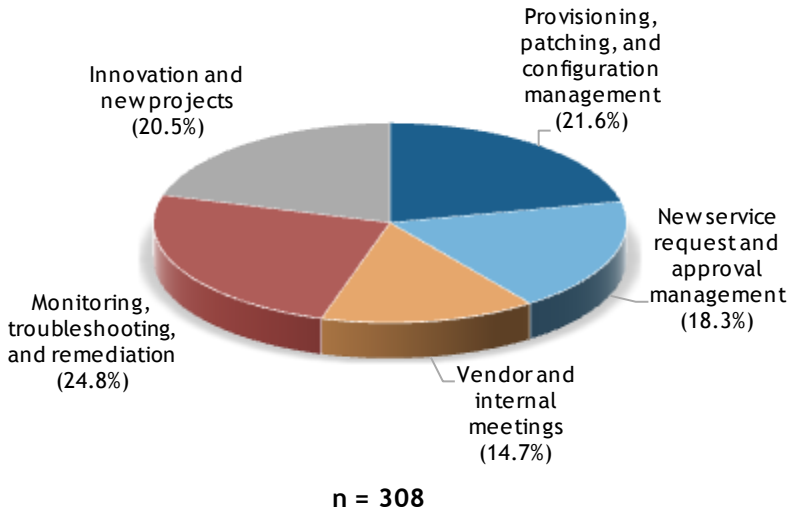
Maintenance Tasks Overwhelming IT Operations

While IT is expected to drive new initiatives, organizations have difficulty finding time and resources for these projects. The same IDC survey mentioned previously finds that the "80/20 rule" still exists within IT departments. As shown in Figure 1, IT administrators spend approximately 80% of their time on simply maintaining the existing infrastructure, with only 20% left for new initiatives.

FIGURE 1

Allocation of IT Administration and Operations Staff Time

Q. Considering the following mix of tasks, over a given week, what percentage of total IT administration and operations staff time (across server, networking, and storage infrastructure) is spent on the following five general tasks?



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Source: IDC's *Integrated Systems End-User Survey,* July 2013

It's critical for IT to employ systems that reduce time spent on routine maintenance as well as increase productivity of IT staff who must often manage multiple and/or remote locations. Reducing mundane daily functions, automating repeatable tasks, and enabling mobile management can greatly increase staff productivity and overall operational efficiency.

Evolving Workloads Require New Design Points

IT applications and services must evolve as companies shift to the 3rd Platform and seek to incorporate new streams of data in analytics, deploy mobile capabilities, and leverage cloud technologies in their environments. The evolving workloads and changing requirements in turn place new demands on server systems. The "general purpose" server is a less applicable term today; there isn't a single standard server configuration that can be deployed to handle all of a customer's workloads.

Most enterprises support a range of workloads with varying system requirements – different applications have distinct compute, memory, storage, and I/O needs. This requires a flexible server portfolio that can provide optimization for the performance of a particular application. In addition to the application, different deployments require a versatile offering of server platforms that includes different form factors. Remote offices and small businesses need an all-in-one system for ease of use; larger enterprises need modularity for future growth and/or a rack design with increased storage for data-intensive workloads.

THE NEXT GENERATION OF DELL POWEREDGE SERVERS

According to IDC data, IT customers have migrated their infrastructure to x86 industry-standard servers over the past decade. This is due in part to the economic advantages and continuing innovation in x86 technology that have enabled business-critical workloads to run on these servers. In this time, x86 has become the predominant server architecture, climbing from 41.5% of total server revenue in 2003 to 76.1% of revenue in 2013.

Dell is introducing the next generation of its PowerEdge servers, which represent its most advanced lineup of systems across racks, towers, and converged systems like blades. Dell has been a driving force in the x86 industry, with one of the most drastic market share increases in the past 10 years. In terms of total server revenue, Dell has climbed from 9.0% market share in 2003 to 16.7% in 2013. In the x86 segment, Dell is the second-largest global vendor for revenue and unit shipments. Building on its proven track record, Dell continues to innovate, introducing new versatile servers that optimize application performance and simplify management operations.

Accelerating Workloads

The next generation of PowerEdge systems is designed to handle customers' evolving workloads, which more than ever require local storage performance to match the capabilities of the server's compute and memory. Dell's newest systems offer a range of in-server storage configurations to match the unique needs of the customer workloads, from all-flash configurations for the most demanding, high I/O applications to hybrid combinations of solid state drive (SSD) and hard disk drive (HDD) for other enterprise applications.

Historically, processor and memory technologies have been on an accelerated innovation curve, following Moore's law of doubling performance every 18 months. However, the same has not quite been true for storage technologies. More specifically, capacity has increased, enabling higher amounts of data storage, but the access speed to the storage has not kept pace. In this generation, the in-server storage designs of PowerEdge have been a point of emphasis to improve overall application performance:

- **Solid state drives and flash storage.** Dell is innovating around flash to bring the storage technology from a high-cost niche solution to the broader market. Through the use of Dell's 1.8in. SSDs and PowerEdge Express Flash NVMe PCIe SSDs, Dell can deliver dense flash storage-optimized server platforms for IOPS-starved applications. The Dell PowerEdge R630 can support up to 24 1.8in. SSDs in just 1U, reducing I/O bottlenecks. It is an excellent choice for OLTP and decision support workloads in which back-end storage can be utilized for capacity rather than performance.
- **Hybrid storage and tiering.** To provide data-tiering capability within the server system, Dell offers hybrid SSD/HDD configurations that combine traditional hard drives with flash storage, enabling in-server storage tiering. This architecture allows the applications to efficiently place the appropriate data on the appropriate tier based on access profile and performance requirements. The most frequently used data can be stored on the SSDs for faster access, improving the performance of database applications and email deployments. As an example, the new PowerEdge R730xd offers a configuration that combines 18 x 1.8in. SSDs and 8 3.5in. HDDs and is capable of easily running workloads like midsize databases without external storage, thus reducing the capex associated with an external storage array.

- **Software-defined storage (SDS).** The virtualization trend that swept the compute world a few years ago is now impacting the storage domain. Customers are increasingly looking to adopt virtualization to improve the performance and utilization of storage technologies. PowerEdge servers can be combined with software-defined storage solutions such as VMware VSAN, Microsoft Storage Spaces, or even OpenStack Ceph to deliver an in-server virtualized storage pool that can very efficiently serve multiple applications when hosted on a PowerEdge platform.

Management Efficiency

Dell's OpenManage portfolio is a comprehensive system management solution that allows IT departments to efficiently manage Dell PowerEdge servers in virtual, physical, local, and remote environments. Deployment and maintenance tasks are automated to deliver greater efficiency of IT operations. OpenManage systems management capabilities deliver access, automation, and flexibility in effectively monitoring and managing PowerEdge servers as well as other Dell and third-party enterprise-class hardware. In addition, embedded in every Dell server system is the integrated Dell Remote Access Controller (iDRAC), which further simplifies and automates systems deployment and firmware updates:

- **Manage from anywhere, anytime.** Dell's new systems management enhancements are designed to empower server administrators to be more efficient, regardless of where they are. With the new OpenManage Mobile, system administrators can access the system via a smart device and monitor its health and performance. With the necessary tools at their fingertips, IT administrators can configure systems and troubleshoot errors, giving them more time and flexibility in managing their IT environment.
- **Enhanced local management.** System configuration and troubleshooting are even easier with two new iDRAC options: iDRAC Quick Sync quickly and securely provides system health information on select platforms via a unique near-field communication (NFC)-enabled bezel and your handheld smart devices, and iDRAC Direct expedites configuration with profiles that can be delivered via an ordinary USB thumb drive or direct laptop connection.
- **New levels of automation.** iDRAC eliminates manual tasks, which in turn reduces the potential for error and speeds time to production. Utilizing policy-based profiles and iDRAC's Auto Configuration feature, IT administrators can automate remote provisioning. By simply connecting a new system to a network and power, the iDRAC Auto Update feature can apply settings and firmware updates as designated by the configuration profile that administrators have established. And by changing the master profile, IT administration can keep every connected server in sync with desired system settings.
- **Template-based infrastructure**. To further accelerate and simplify IT service delivery, the PowerEdge servers can also be managed with the Dell Active System Manager (ASM). With ASM, service templates enable rapid system provisioning and utilize configurations that can be abstracted to other servers.

Versatile Platforms

IDC finds that most enterprises operate heterogeneous environments with a wide variety of workloads; no one server form factor or configuration can adequately handle all environments or applications. Dell is offering a versatile portfolio of systems that can match the unique needs of the customer's application, from large-scale Web deployment to mission-critical enterprise applications to remote brand deployments.

- **Modular.** Dell's modular systems are designed to deliver optimal resources for the current workload without costly overprovisioning. From large datacenters to branch offices, there is a PowerEdge server designed for the precise capacity needed. As business demands grow, IT customers are able to incrementally deploy systems to ensure peak optimization. The PowerEdge shared infrastructure servers, the M-Series blades, and VRTX enable IT to easily scale and allow multiple generations of technologies in the same density, power, and cooling envelopes.
- **Tailored.** With Dell's systems, customers have options to tailor the server to their unique needs. Customers can opt for compute- and memory-centric designs for virtualization and cloud environments. Ultra-dense local SSD storage options are suitable for data analytic applications, and a hybrid SSD/HDD provides local data tiering that combines performance and capacity.
- **Manageable**. Given the complexity of IT management, customers don't want additional management tools; they want to keep using the consoles they're used to. Dell's approach is to allow the system administrator to simplify system management by integrating agent-free management capabilities and automating time-consuming daily tasks. Customers can choose to integrate this environment with Dell's OpenManage Essentials management console or utilize third-party consoles – whatever best meets their needs.

Dell PowerEdge Portfolio

Rack servers. A full range of rack-optimized servers in flexible configurations of 1, 2, and 4 sockets

- Entry-level options deliver economic value.
- Advanced options are workload optimized for virtualization and data analytics.
- Premium models create a dynamic infrastructure for cloud and big data.

Shared infrastructure. Systems that integrate server, storage, networking, and management to simplify IT operations

- PowerEdge VRTX: A converged IT platform delivering full capabilities for remote and small offices
- PowerEdge M-Series blades: A dense modular solution with central management

Tower servers. Entry-level to advanced-level pedestal servers that deliver enterprise performance for remote offices and midsize enterprises

Support Services

Dell offers a wide range of professional services to simplify the assessment, design, implementation, management, and maintenance of the IT environment and to help organizations transition from platform to platform. These services include IT consulting, deployment, technical training, and support.

With a specific goal to simplify the IT administrator's daily tasks and proactively resolve problems, Dell offers automated support software, SupportAssist, available free of charge on select PowerEdge servers used for mission-critical applications. Integrated into the Dell OpenManage Essentials console, SupportAssist provides automated proactive features that help streamline the support process, maintain a system's health, and identify hardware failures faster and more accurately.

CHALLENGES/OPPORTUNITIES

- IDC believes that in an effort to drive more value, IT organizations will increasingly look to their technology providers as partners rather than simple suppliers. Dell will have the opportunity to differentiate itself from competitors by demonstrating itself as a fully capable IT vendor with intelligent server platforms that aid IT in delivering value back to the business.
- IDC recognizes that in today's market, customers have more options — Dell will face competition not only from traditional vendors but also from cloud service providers. Small companies that previously may have deployed servers may opt for the infrastructure-as-a-service model. Dell must continue to innovate on platforms, such as VRTX, that deliver ease of use for distributed environments.

CONCLUSION

Driven by cloud, mobile, social, and big data trends, the changes in the server industry are accelerating. In many ways, IT services will become ubiquitous in all parts of the business — from business development to decision strategy to client services. A critical success factor for companies will be for their IT organizations to deploy systems into their environment that can accelerate applications and improve operational efficiency.

x86 systems have been in the mainstream server market for more than a decade, to the point where they are now considered by many the de facto system architecture. Yet, even though this architecture is proven, it still is hindered by legacy issues such as operational inefficiencies and lack of performance for the toughest workloads. IDC believes further innovation is required to drive the industry forward.

Dell's PowerEdge server portfolio is the foundation of a comprehensive enterprise systems portfolio that also includes storage, networking, software, and end-user solutions. The server systems incorporate the latest innovations from Dell that improve ease of use and performance for a wide range of Web, enterprise, and hyperscale applications.

About IDC

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