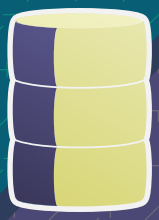
Up to 80% more orders per minute

Improve employee productivity

Up to 33% more VMs

Get more compute power in less space and help improve asset utilization



Boost database performance in VMware vSAN environments with Toshiba PX05S SAS SSDs and Dell EMC PowerEdge R740xd servers

Process more orders per minute to help drive productivity and improve customer satisfaction

Database users won't tolerate delays—and businesses can't afford dissatisfied customers. But running databases on a legacy server with outdated drives can slow a business down, especially during times of peak traffic. A new Dell EMC server infrastructure configured with Toshiba PX05S solid-state drives (SSDs) increased the number of orders processed per minute and delivered faster response times, helping businesses more effectively meet customer demand.

We ran a transactional database workload on a new Dell EMC™ PowerEdge™ R740xd cluster using VMware vSAN™ and Toshiba PX05S SAS SSDs, as well as a legacy PowerEdge R730 vSAN cluster configured with hard disk drives (HDDs) and SATA SSDs. The newer solution processed more orders per minute, supported more virtual machines (VMs), and provided lower latency, demonstrating that the newer Dell EMC solution using all-flash Toshiba PX05S solid-state storage can improve customers' online experience. With satisfied customers and more efficient hardware, businesses can focus on growth.

E-commerce is booming. Can older servers and drives keep up?

The online shopping industry is growing at tremendous rates. In 2017 alone, e-commerce revenues in the US soared by nearly 17 percent compared to 2016.[1] The statistics aggregation site Statista projects that e-commerce revenues will expand from US$2.3 trillion in 2017 to US$4.8 trillion by 2021.[2] An organization's database infrastructure plays a key role in supporting e-commerce activities. How can companies ensure their infrastructure supports expected business growth?

Database servers—and the hardware inside of them—work behind the scenes to process e-commerce transactions. But if already maxed out legacy servers and drives must handle a sudden surge in database processing (for example, when an online sale leads to an influx of visitors), customers can experience the resulting overload as sluggish performance. These delays have real-world consequences for a company's bottom line: An Aberdeen Group report showed that even a one-second delay can impact customer satisfaction by 16 percent,[3] while a report by Forrester Consulting revealed that 18 percent of shoppers who abandoned their checkout carts did so because sites were too slow or took too long to load.[4]

With newer servers and more powerful drives, organizations can process more orders, increasing their ability to service more online transactions. In our testing, a PowerEdge R740xd server configured with Toshiba PX05S SAS SSDs and VMware vSAN supported 33 percent more VMs than the legacy solution. This greater capacity translated into 80 percent more orders per minute (OPM) compared to the legacy solution. By improving transactional database performance, the PowerEdge R740xd solution with Toshiba PX05S SAS SSDs could help organizations expand their databases to support a growing customer base.

Toshiba PX05S SAS SSDs

According to Toshiba, the PX05S Series is "optimized for mission-critical hyperscale and virtualized environments."[5] The 12Gbit/s SAS SSD offers up to 3.2 TB of storage and 270K input/output operations per second (IOPS) random read performance. In our testing, we configured each Dell EMC PowerEdge R740xd with four 3.2TB Toshiba PX05S SSDs.

Up to 80%
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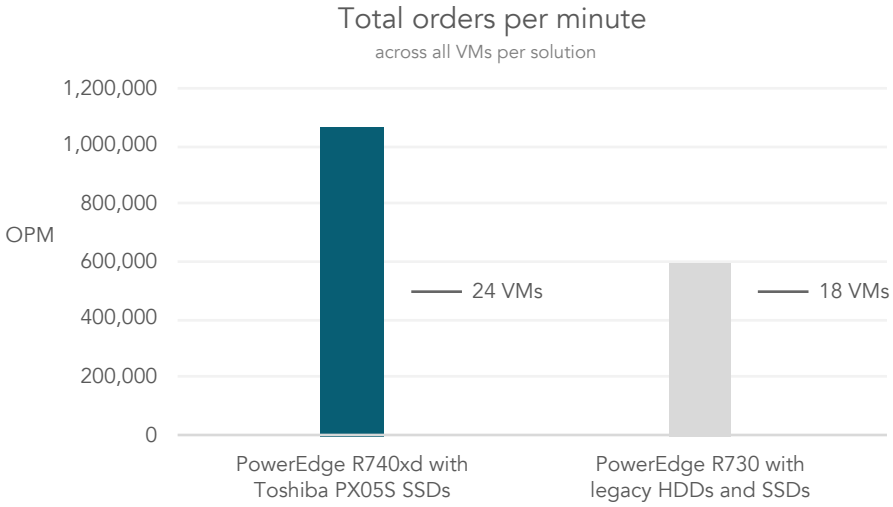
Improve employee productivity



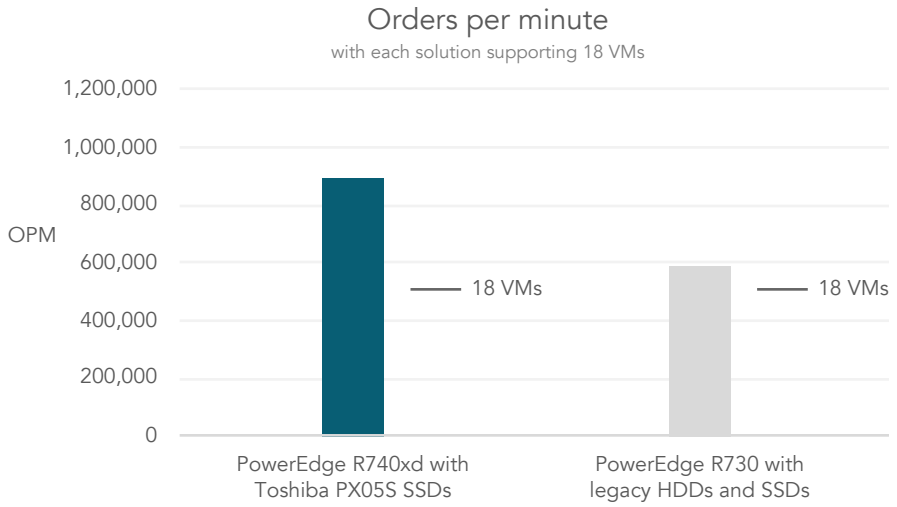
How we measured transactional database performance

To compare the transactional database performance of the legacy hardware to that of the newer solution, we set up two three-node VMware vSAN clusters: one with PowerEdge R740xd servers and Toshiba PX05S SAS SSDs, and one with legacy R730 servers and older generation SATA SSDs and HDDs. We used DVD Store 2, a benchmarking tool that simulates the activity of an online retail store, to test the online transaction processing (OLTP) capabilities of both solutions. We hosted the DVD Store 2 databases on SQL Server® 2017 VMs. See the science behind the report for more detailed testing information.

Process orders faster and serve more customers

By processing more orders each minute, the PowerEdge R740xd solution could help companies support more customers, enabling business growth. In fact, when we provisioned each server cluster with 18 VMs running the DVD Store 2 workload, the newer solution processed 50 percent more OPM than the legacy solution. The R730 solution managed only 592,828 OPM, while the newer R740xd servers with Toshiba PX05S SAS SSDs and VMware vSAN processed 891,510 OPM.

This increased transactional database performance carries multiple real-world benefits. Not only do more orders per minute mean organizations can assist more customers, but the Toshiba-Dell EMC solution functions in the same amount of space as the legacy solution. This means companies could increase their customer base without surrendering additional space or spending more for overhead costs such as power and cooling.



The Dell EMC PowerEdge R740xd

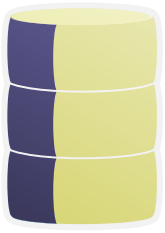
The 14th generation Dell EMC PowerEdge R740xd offers strong database performance with a variety of storage configuration options. Though we tested with four Toshiba PX05S Series SAS SSDs per server, the PowerEdge R740xd offers support for up to 24 NVMe SSDs.[6]

Increase flexibility and scalability with more virtual machines

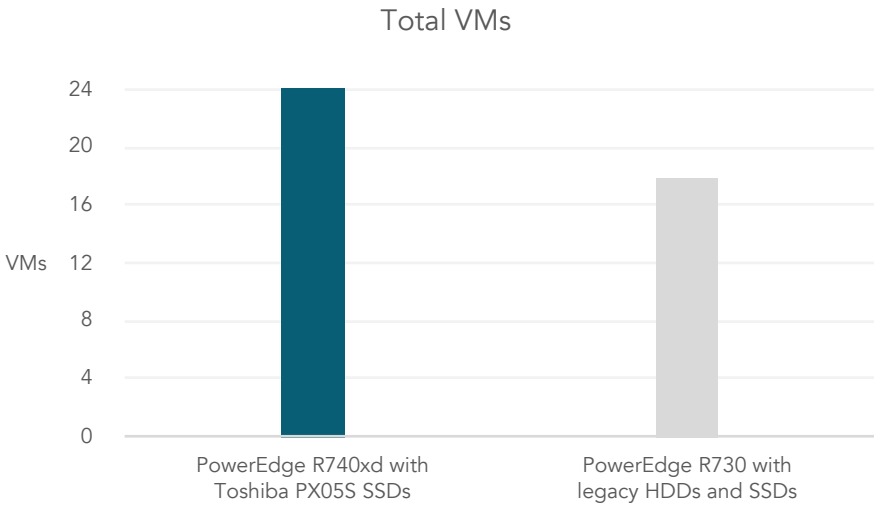
Virtual machines (VMs) emulate separate physical servers, enabling organizations to use hardware resources more efficiently by running multiple application servers simultaneously. According to a 2016 survey conducted by Spiceworks, 76 percent of companies had adopted server virtualization.[7] Businesses can benefit from tapping into the increased flexibility of virtualization—but what about performance?

Virtualized compute environments rely on powerful servers configured with high-performance internal storage. With the higher VM density of the PowerEdge R740xd solution with Toshiba PX05S SAS SSDs, IT administrators can deploy more VMs per server and scale database performance. During testing, we followed VMware vSAN capacity sizing guidelines and kept the storage consumption of the 135GB VMs below 70 percent.[8] We then determined the number of VMs each solution could support while remaining within recommended capacity and performance thresholds.

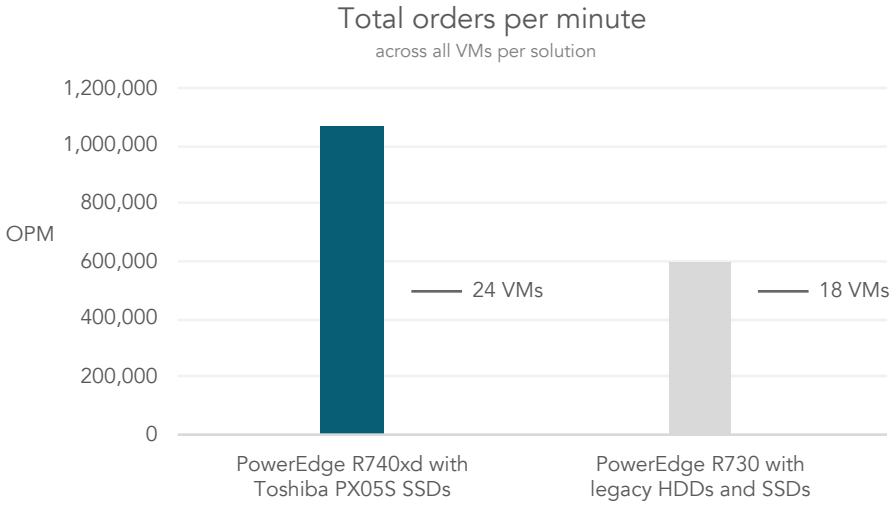
Up to 33%
more VMs



Get more compute power in less space and help improve asset utilization



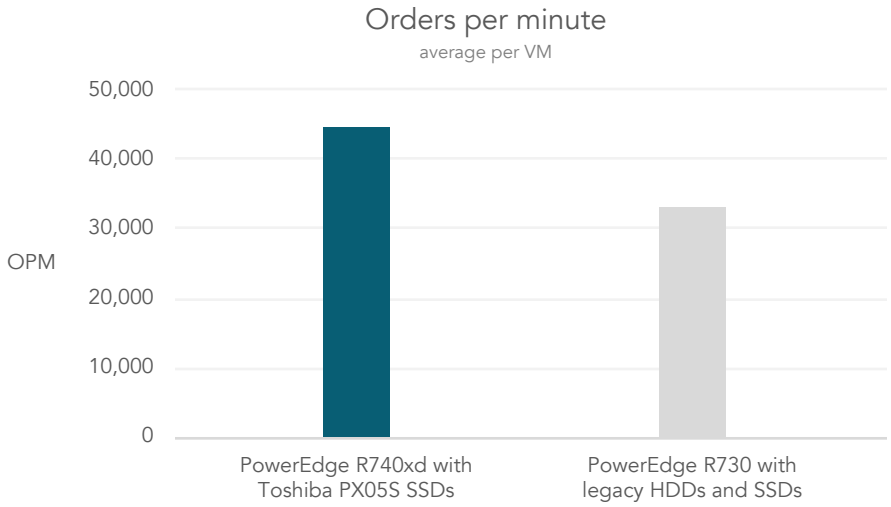
Our testing revealed that the legacy server configuration could only support 18 VMs, delivering 595,828 OPM. The Toshiba-Dell EMC solution demonstrated greater capacity, supporting 33 percent more VMs and processing 1,067,868 OPM—an 80 percent improvement over the legacy solution.



Up to 80%
more OPM

Improve employee productivity

While a net increase in OPM might be expected given the additional VMs, when we averaged the testing results on a per-VM basis, the R740xd solution outperformed the legacy solution with 30 percent more OPM—meaning that even while the newer solution was hosting six more VMs, it still maintained better transactional database performance for each VM.



By harnessing the power of a Dell EMC PowerEdge R740xd solution and Toshiba PX05S SAS SSDs, businesses can deploy more VMs and offer more applications that benefit customers. What's more, businesses running more VMs on fewer servers can shrink their datacenter footprint, which can reduce operational costs and benefit the bottom line.

Process orders faster with lower latency

To keep pace with expected e-commerce growth, businesses need infrastructure with low storage latencies. Compared to the older solution we tested, the Dell EMC PowerEdge R740xd solution with Toshiba PX05S SAS SSDs improved storage performance, delivering up to 68 percent lower write response times and 53 percent lower read response times. For businesses, lower latencies can translate into faster order processing and an improved customer experience.

Up to 68%
lower latency

Process online database transactions faster

Conclusion

Our testing showed that upgrading servers and drives to a Toshiba-Dell EMC solution could yield big gains for companies when it comes to transactional database performance and VM hosting. Using Toshiba PX05S SAS SSDs and VMware vSAN, the Dell EMC PowerEdge R740xd servers processed more orders per minute, supported more virtual machines, and provided lower latencies than the legacy solution. These advantages can help businesses support their growing client bases, give their customers a more responsive experience, and set themselves up for long-term success in a rapidly growing market.

To find out more about the Dell EMC and Toshiba partnership, visit http://www.dell.com/toshiba and https://storage.toshiba.com/dell

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Read the science behind this report at http://facts.pt/DWCDLj ▶

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