

323,267 read I/O operations per second

Process large numbers of transactions during activity spikes



0.87ms read latency

For great user efficiency with minimal wait times



Choose a Dell EMC PowerEdge R740xd with Toshiba PX05S SAS SSDs to drive productivity

The new Dell EMC and Toshiba solution delivered fast response time performance on a read-heavy workload

At the company where Monica works as a database administrator, management is encouraging all departments, from marketing to technical support, to make materials and catalog offerings available to customers over the Internet. As a result, the amount of content on the company website is exploding. Some resources, such as PDF manuals, generate relatively little input/output (I/O) load each time a user accesses them. Other resources generate quite a bit. These include applications that use databases for product searches, product availability, and customer-specific data such as purchase history. Is it any surprise that the servers the company has had for years are having trouble keeping up?

At Principled Technologies, we conducted hands-on testing of one solution Monica should consider: a new Dell EMC™ PowerEdge™ R740xd configured with Toshiba PX05S Enterprise SAS SSDs. We ran a read-intensive workload and found that in terms of both read IOPS and read latency times, the Dell EMC-Toshiba solution would allow Monica's datacenter to meet the growing needs of their customers.

The following pages describe a fictional scenario in which a database administrator updates her company's hardware to a new Dell EMC PowerEdge R740xd configured with Toshiba PX05S Enterprise Read Intensive SAS SSDs. Though the story is hypothetical, it's based on PT facts. For more detailed testing information, see the [science behind the report](#).

Monica gets the green light

In her monthly meeting with the management team, Monica makes the case for refreshing the older hardware in her datacenter. Once the team sees the long response times customers are facing when they access the expanding volume of online content, they give her the go-ahead.

Monica knows storage plays a critical role in increasing the number of transactions a server can complete while keeping response time down, so she spends as much time investigating storage options as she does server choices. After much research and number-crunching, she determines that SAS solid-state drives hit the sweet spot in terms of delivering the I/O performance they need in a space-efficient 2U server. She is particularly interested in the new Dell EMC PowerEdge R740xd using Toshiba PX05S SAS SSDs optimized for read-intensive workloads.



Toshiba PX05S Series Enterprise SAS SSDs

According to Toshiba, "the PX05S Series is designed for read-intensive application workloads including web servers, data warehousing, media streaming and VOD and offers large capacities up to 4TB with 12.0 Gbit/s SAS interface."¹

In our testing, we equipped the Dell EMC PowerEdge R740xd with six 1.92TB PX05SRB192Y SAS drives.


IOPS insights: Using an Oracle I/O benchmark to assess how a server-storage solution will fare under heavy load



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To assess how the Dell EMC PowerEdge R740xd using Toshiba PX05S Enterprise SAS SSDs handled a transactional database workload, we used the Silly Little Oracle Benchmark, or SLOB. (See the [science behind the report](#) for more information on our specific SLOB workload.) Oracle workloads can pose great demands on a server-storage solution, so strong performance on such a workload indicates how well the solution can handle other database workloads, too.

In an environment like the one at Monica's company, where customers log in to download materials or search and browse through offerings 24-7 and employees only occasionally upload new items to the database, read transactions heavily outweigh write transactions. To reflect this, we tuned the SLOB workload to use 90 percent read operations and 10 percent write operations.



**0.87ms
read latency**

Do you read me?

In our hands-on testing, the new PowerEdge R740xd server with Toshiba PX05S Enterprise Read Intensive SAS SSDs handled 323,267 read I/O operations per second. It did so with an average read latency of only 0.87 milliseconds. (Take a look at the [science behind the report](#) for more results, including write I/O and latency.)

Customers have come to expect near-immediate responses to their clicks. The digital performance measurement firm Dynatrace found that an extra half-second when loading pages could reduce sales by 10 percent for an online retailer.² The 0.87ms read latency the PowerEdge R740xd server with Toshiba PX05S Enterprise Read Intensive SAS SSDs delivered is over 500 times smaller than half a second.

These are numbers that would serve Monica's company well. Whether customers are scouring the site for researching an upcoming purchase or trying to troubleshoot problems with a product they already own, the Dell EMC and Toshiba solution is positioned to give them what they need quickly.



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 six Toshiba PX05S Enterprise Read Intensive SAS SSDs, the PowerEdge R740xd offers support for up to 24 NVMe SSDs.³

Conclusion

Monica's database servers are struggling to keep up with her company's growing online presence and increasing customer demand. In our testing, the new Dell EMC PowerEdge R740xd server with Toshiba PX05S Enterprise SAS SSDs delivered 323,267 read I/O operations per second with an average read latency of only 0.87 milliseconds. This solution would offer the boost her company's datacenter needs.

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



- 1 Toshiba PX05SRB/PX05SRQ Series, accessed April 16, 2018.
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- 2 "How long will you wait for a shopping website to load?," accessed April 16, 2018,
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Read the science behind this report at <http://facts.pt/Eq3a6x> ►



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