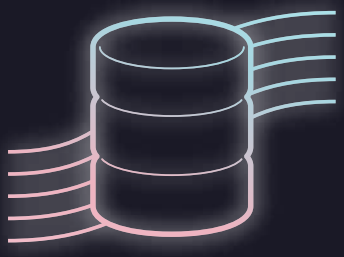
Upgrade to better-performing storage without breaking the bank

Toshiba RM5 Series Value SAS SSDs provided better storage performance for an Oracle Database 12*c* workload than Samsung Enterprise SATA SSDs

Improving business-critical application performance and supporting more users can help organizations succeed—and these benefits don't have to come at a high cost. Upgrading outdated SATA solid-state drives (SSDs) to Toshiba RM5 Series Value SAS SSDs offers an affordable option to improve the performance of large Oracle® Database 12*c* workloads on HPE ProLiant Gen10 servers.

In the Principled Technologies datacenter, we fitted an HPE ProLiant DL380 Gen10 server with Samsung Enterprise SATA or Toshiba RM5 Series Value SAS SSDs. When we put the drives to work processing a read-intensive Oracle input/output (I/O) workload, the Toshiba SAS SSDs handled significantly more input/output operations per second (IOPS) than the SATA SSDs, demonstrating that the Toshiba drives can let your organization do more database work or support more customers without a hefty additional capital expenditure.

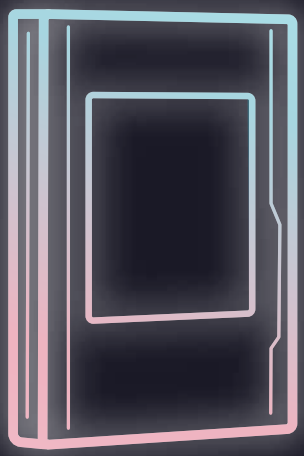
If you have SATA SSDs in your datacenter, this report explains how upgrading to high-value Toshiba RM5 Value SAS drives can accelerate the performance of your business-critical Oracle applications.



Improve transactional database workload performance

Deliver over 2X the IOPS with Toshiba RM5 Value SAS SSDs*

*Compared to Samsung Enterprise SATA SSDs



Why SAS beats SATA in speed, reliability, and capacity

Traditional SATA SSDs store large amounts of data at a low cost, but organizations relying on the SSDs sacrifice performance and reliability to save money. Organizations now have more to worry about than inexpensive capacity. Your organization and its users both demand results as fast as possible. To that end, SAS SSDs typically read and write information much faster than SATA SSDs, enabling your organization to better match service to customer demand.

SAS drives are typically more reliable than SATA drives. According to Samsung, the mean time between failures (MTBF) for the Samsung PM863a Enterprise SATA SSDs is 2.0 million hours.[1] According to Toshiba, the mean time to failure (MTTF) for RM5 Series Value SAS SSDs is 2.5 million hours.[2]

In addition, SAS drives have greater queue depths and larger capacities than SATA drives for transactional applications,[3] providing better performance for transactional applications such as Oracle Database 12*c*. A queue for a transactional database lists transactions in order to be processed, and typically, a higher queue depth equates to better performance. Toshiba's new RM5 Value SAS Series offers up to 7.68 TB of storage, whereas the Samsung PM863a Enterprise SATA SSDs provide only up to 3.84 TB, half the RM5 series maximum capacity.

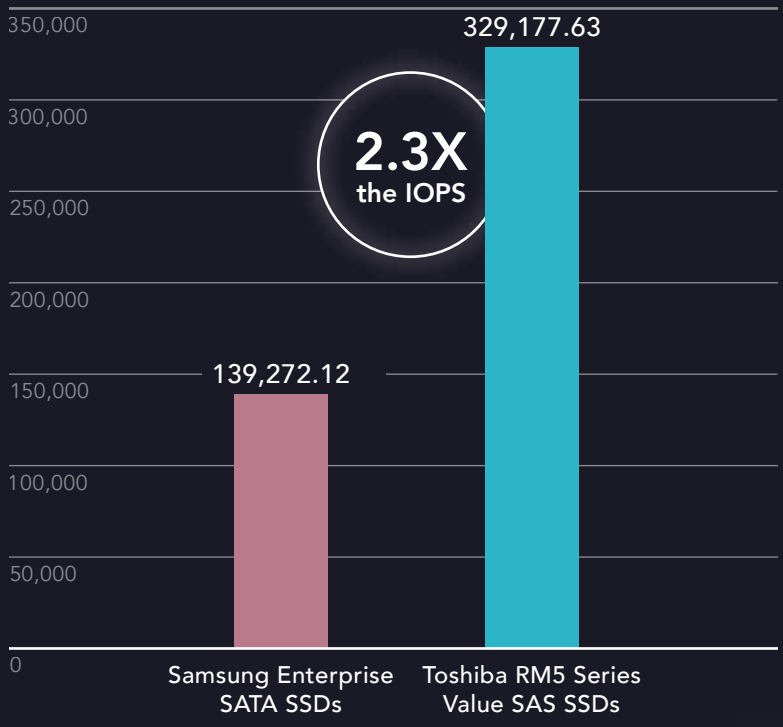
What IOPS can mean to your organization and its applications

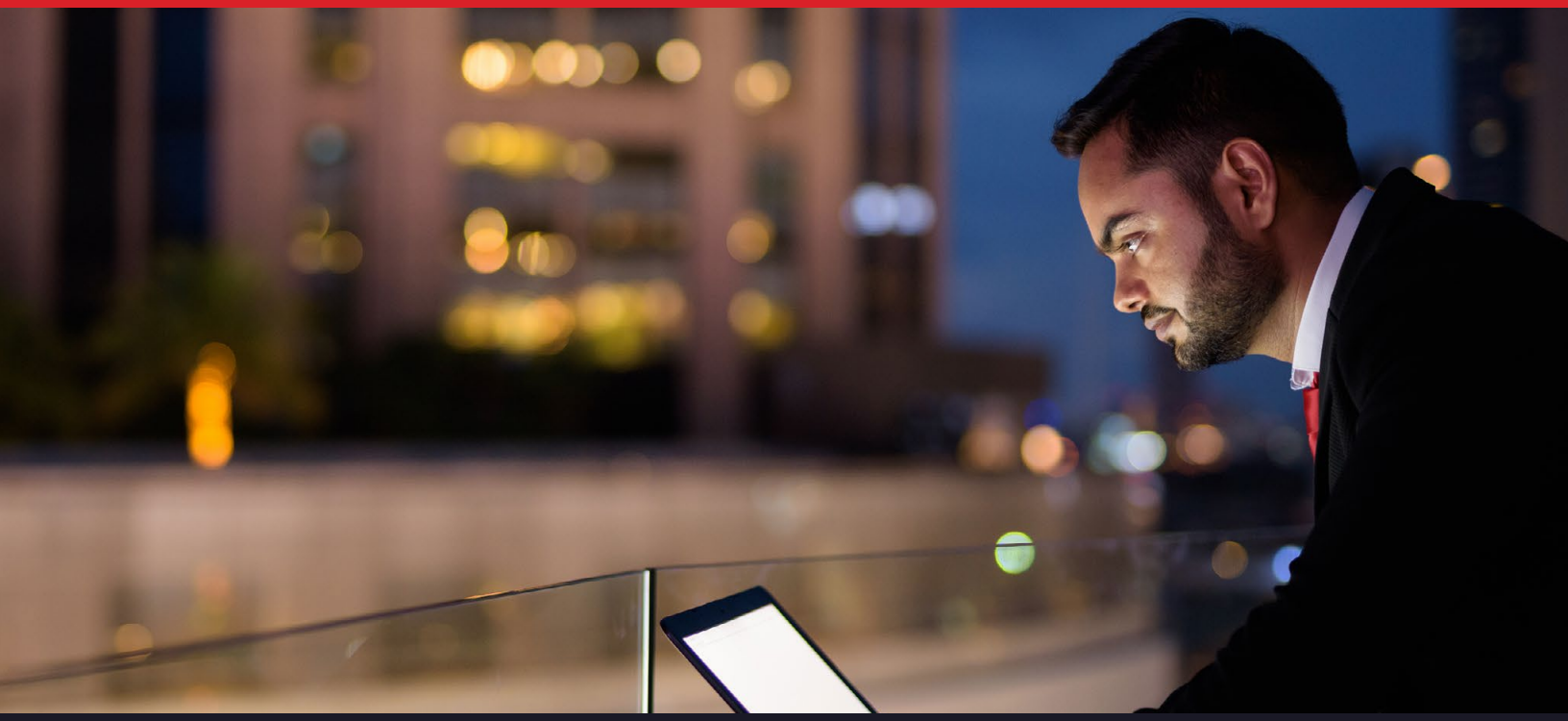
To test the amount of data each SSD was capable of pushing, we assessed each solution's ability to handle IOPS, a measure of storage performance used to compare the transactional performance of storage media. To measure IOPS for Oracle Database 12*c* instances, we ran the Silly Little Oracle Benchmark (SLOB), a tool that generates random read and write I/O operations to mimic workload activity.

While running SLOB, the Samsung Enterprise SATA SSDs demonstrated just over 139,000 total IOPS (both reads and writes). In comparison, the Toshiba RM5 Value SAS SSDs overshadowed that performance with more than 329,000 IOPS, or 2.36 times the IOPS of the SATA solution. Delivering more IOPS means more transactions for databases, which could translate to better overall application performance for your organization.

Input/output operations per second (IOPS) results

Total reads and writes per second





Conclusion

If your organization wants to improve performance of business-critical Oracle database applications without a significant investment, look to Toshiba. The Toshiba RM5 Series Value SAS SSDs delivered more than double the storage operations per second of the Samsung PM863a Enterprise SATA SSDs. Faster storage means more users can access data with fewer delays, which can lead to more sales and more happy customers.

1 "SSD PM863a: Superior Mixed Workload Performance," accessed October 9, 2018, https://www.samsung.com/semiconductor/minisite/ssd/product/enterprise/pm863a/

2 Toshiba Memory America, Inc. provided this info June 19, 2018

3 Adshead, Anthony, "Storage 101: Queue depth, NVMe and the array controller," accessed September 10, 2018, https://www.computerweekly.com/feature/Storage-101-Queue-depth-NVMe-and-the-array-controller

Read the science behind this report at http://facts.pt/kh0uw9 ►

Principled Technologies®

Facts matter.®

This project was commissioned by Toshiba.