

Enhancing Performance and Reducing Costs for Microsoft® SQL Server®

Ultrastar SSDs can handle your most demanding Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP) workloads, delivering both performance and capacity in single and clustered Microsoft SQL Server® workloads.

What Ultrastar Drives Can Do for Your Business

- Speed up database operations without affecting primary storage
- Provide shared storage for clustered databases, without need for a SAN
- Consolidate servers, reducing capital and licensing costs
- Host high-performance replicas in an Always On Availability Group

Microsoft SQL Server Needs Flash Acceleration

Your business depends on mission-critical databases running Microsoft SQL Server®. Database administrators need to provide adequate performance, capacity, and reliability to ensure your business can operate effectively. Ultrastar® Solid State Drive (SSD) technology from Western Digital can be a powerful tool to achieve these goals. Instead of scaling out into massive arrays of servers with additional hardware and software licensing costs, or investing in an expensive and hard-to-manage, ultra-performance SAN, you can use local SSDs to increase query performance, provide needed capacity, and ensure reliability—simply and cost-effectively. With Ultrastar SSDs powering your Microsoft SQL Server applications, your database administrators can increase productivity, serve end users faster, and use server hardware more effectively at a lower total cost.

Reducing Top-Line Costs

Ultrastar SSDs bring storage capacity and performance to a new level by dramatically speeding up I/O operations. Faster I/O allows each server in your cluster to handle more transactions and process more data at a faster rate. Handling higher workload volumes faster and with fewer CPU resources enables you to consolidate the number of servers you need. Server resource consolidation means cutting capital costs and decreasing power and cooling expenses, plus the often-overlooked savings of reduced software license fees.

Increasing Bottom-Line Value

Ultrastar SSDs are built to drive better business outcomes. By speeding up I/O-bound workloads, our SSDs can allow for deeper, more complex query generation and processing in real time. Existing I/O-bound queries can also speed up, increasing user satisfaction with system performance.

No One "Right Way" for Microsoft SQL Server on Flash

There is more than one way to deploy Ultrastar SSDs into Microsoft SQL Server clusters, giving architects the freedom to craft the ideal design for any given business need. Depending on individual needs, flash storage can be applied to accelerate specific workloads or to take over all database storage needs.

Pain Point: Speeding Up Servers without Needing High-Availability Flash Storage

The easiest and least disruptive method of accelerating SQL workloads is to simply provide individual servers with local SSD storage. This method allows any existing data availability arrangement, whether it is a highly available SAN, a multipath SAS JBOD with Windows® Storage Spaces, or an Always On Availability Group, to be untouched. A direct-to-CPU connected NVMe Express™ (NVMe™) SSD, such as the Ultrastar DC SN630

or Ultrastar DC SN200 with high-write lifetime can be added to all existing servers for temporary usage (TEMPDB). Complicated business queries with large intermediate result tables can take advantage of this temporary local storage for a significant performance boost. Because this storage is used only as a scratch space for the server, no high availability or replication is necessary.

Pain Point: Accelerating Databases on Windows Storage Spaces

Many traditionally deployed SQL Server installations already use a shared RAID + JBOD approach with Windows Storage Spaces to ensure a highly available, redundant database for business needs. Standard Windows fault-tolerance technologies ensure continued availability of service while RAID helps protect from data loss. This same, well-understood method can also be used with SAS SSDs to provide an immediate performance boost to I/O-limited workloads. With up to multi-terabyte models available, full support for RAID controllers and 12G SAS multipathing, the Ultrastar DC SS530 provides capacity for existing and future database workloads as your business needs change.

Pain Point: Slow Queries in Always On Availability Groups

Another way to provide a highly available, flash-based Microsoft SQL Server instance is to use Always On Availability Groups. This enables Microsoft SQL Server to perform database-level replication, either

synchronously or asynchronously, depending on your application's needs, between separate servers with private storage. Database administrators can then deploy local SSDs through SATA, SAS, or NVMe, while still ensuring data is available and replicated in case of failure. This architecture is also effective for business applications with read-heavy access patterns, because Always On allows multiple read-only copies of the live database on different servers. For example, you can run a high-CPU-usage analytics query against a dataset on a read-only mirror of the live database without impacting the performance of real-time users. In these workload types, front-loading NVMe-based Ultrastar DC SN200 can provide the highest levels of performance for mission-critical applications. If maximum capacity per server is essential, you can use multiple Ultrastar DC SS530 SAS drives with a RAID controller, providing over 6 terabytes of storage per 2.5" drive slot in a server or SAS JBOD.

Summary

The criticality of your Microsoft SQL Server environment makes Ultrastar SSDs a requirement for your data center, not an option. They can deliver microsecond data access latency, lower memory utilization, and greater CPU and server utilization. Ultrastar SSDs are built to drive better business outcomes by reducing cost, increasing efficiency, and streamlining your SQL Server data center. This makes your systems more manageable and optimized for productivity and growth.

	SAS SSD	NVMe SSD	NVMe SSD
Pain Point	Ultrastar® DC SS530	Ultrastar® DC SN630	Ultrastar® DC SN200
Speeding up servers without needing high availability flash storage		• •	• • •
Accelerating databases on Windows storage spaces	• • •		
Slow queries in always-on availability groups		• • •	• • •

Legend: • = Good •• = Better ••• = Best

Western Digital.

5601 Great Oaks Parkway
 San Jose, CA 95119, USA
US (Toll-Free): 800.801.4618
International: 408.717.6000
www.westerndigital.com

© 2017-2019 Western Digital Corporation or its affiliates. All rights reserved. Produced 4/17, Rev. 4/19. Western Digital, the Western Digital logo and Ultrastar are registered trademarks or trademarks of Western Digital Corporation or its affiliates in the US and/or other countries. The NVM Express™ and NVMe™ word marks are trademarks of NVM Express, Inc. Microsoft®, Windows®, and SQL Server® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. All other marks are the property of their respective owners. One MB is equal to one million bytes, one GB is equal to one billion bytes, one TB equals 1,000GB and one PB equals 1,000TB when referring to HDD/SSD capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the HDD/SSD drive, the computer's operating system, and other factors.