Western Digital

Data Center Storage Solutions

Powering the Data Revolution

For more than 50 years, Western Digital® has been enabling data at scale. Our data center SSDs, HDDs, fabric bridges, and platforms enable our customers to gain and leverage insights that they can extract from the zettabytes of data being generated by smart factories, connected endpoints, autonomous vehicles, IoT devices and more. Our robust portfolio and our outstanding customer service help companies and individuals transform their businesses with data.

Essential Data Infrastructure for the Zettabyte Age

Western Digital.

Ultrastar® Data Center SSDs

- Portfolio breadth and depth for cloud computing to high-performance servers
- Industry-leading NAND
- Vertically integrated controllers and firmware

Ultrastar Data Center HDDs

- 1st with OptiNAND™-enabled 22TB CMR & 26TB SMR HDDs
- 1st with Energy-Assisted Magnetic Recording technology
- 1st with Triple Stage Actuator
- 1st with helium-filled HDDs

Ultrastar and OpenFlex™ Platforms

- High-capacity disk storage platforms
- High-performance flash storage platforms
- Innovative ArcticFlow™ & IsoVibe™ technologies
- Open Composable Infrastructure Solutions

RapidFlex™

- High-performance Fabric Bridge Device
- Server and JBOF applications
- TCP and RoCE Offload
- Support by Open Composable Infrastructure

Trusted Storage Delivering Innovation Across All Technologies

NVMe™ SSDs

Low-latency, high-performance NVMe SSDs to accelerate your data center workloads

Helium-filled HDDs

Highest capacity HDDs for data center expansion and cost-efficient scale

Air-filled HDDs

Economical and reliable data access for traditional data center application

Platforms

Complete portfolio of storage platforms and servers for SATA, SAS, NVMe and NVMe-oF™

Fabric Bridges

Enable NVMe over fabrics (NVMe-oF) attached storage systems using fabric bridge devices and adapters

Optimize Your Data Center with Ultrastar SSDs

	Ultrastar DC SN655	Ultrastar DC SN650
Compute Intensive/HPC	✓	
All Flash Array Primary Storage	✓	
Relational Databases	✓	
Artificial Intelligence/Machine Learning	✓	✓
Converged/Hyperconverged Infrastructure	✓	✓
OLTP	✓	
OLAP	✓	
Virtualization	✓	✓
noSQL Databases	✓	✓
Content Caching	✓	✓
File/Object Storage	✓	✓
Cloud Compute/Cloud Storage	✓	✓

Ultrastar Data Center NVMe SSDs

	Performance NVMe	Mainstream NVMe
		
	Ultrastar DC SN655	Ultrastar DC SN650
Interface	PCIe Gen4 1x4, 2x2, NVMe 1.4	PCIe Gen4 1x4, NVMe 1.4
Form Factor	U.3. 15mm	U.3. 15mm
Endurance/Capacity (GB)[1,2]	1 DW/D: 3840, 7680, 15360	1 DW/D: 7680, 15360
NAND	3D TLC	
Seq R/W (MB/s), up to[3]	6,800/3,700	6,600/2,800
Random R/W (KIOPS), up to	1,100/125	970/109
Reliability[4]	Unrecoverable Bit Error Rate (UBER): 1 in 10^{17} MTBF (M hours): 2.5 AFR: 0.35%	Unrecoverable Bit Error Rate (UBER): 1 in 10^{17} MTBF (M hours): 2 AFR: 0.44%
Security	SE, ISE, TCG Ruby	SE, ISE

Ultrastar Data Center HDDs

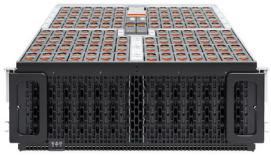
Helium-filled Hard Drives

	Ultrastar DC HC670	Ultrastar DC HC570	Ultrastar DC HC560	Ultrastar DC HC550	Ultrastar DC HC530	Ultrastar DC HC520
Interface	SATA 6Gb/s, SAS 12Gb/s					
Rotational speed (RPM)	7200					
Form Factor	3.5-inch data center HDD					
Capacity (TB)	26	22	20	18, 16	14	12
Format	4Kn 512e			512e		
Sustained transfer rate (MB/s, max)[5]	261	291	269	269 (18TB) 262 (16TB)	267	243
Idle_A (W), SATA/SAS[6]	5.7/6.1	5.7/6.0	6.0/6.1	5.6/5.8	5.5/5.9	5.0/6.1
ArmorCache™	Yes					
Reliability[7]	MTBF (M hours): 2.5, projected AFR: 0.35%, projected Workloads: up to 550TB/year			MTBF (M hours): 2.5 AFR: 0.35% Workloads: up to 550TB/year		
Security	Base (SE), SED, SED-FIPS	Base (SE), SED		Base (SE), SED, SED-FIPS		

Ultrastar Data Center HDDs

	Air-filled Hard Drives			
				
	Ultrastar DC HC330	**Ultrastar DC HC320**	**Ultrastar DC HC310**	**Ultrastar DC HA210**
Interface	SATA 6Gb/s, SAS 12Gb/s			SATA 6Gb/s
Rotational speed (RPM)	7200			
Form Factor	3.5-inch data center HDD			
Capacity (TB)	10	8	6, 4	2, 1
Format	512e 512n available on 4TB capacity			512n
Sustained transfer rate (MB/s, max)	262	255	255 233 w/512n	200 (2TB) 184 (1TB)
Idle (W), SATA/SAS	8.0/9.0	7.4/8.4	5.9/7.0	5.9/NA
Reliability	MTBF (M hours): 2 AFR: 0.44% Workloads: up to 550TB/year			
Security	Base (SE), SED, SED-FIPS			SE

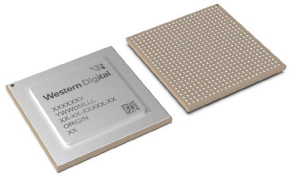
Ultrastar Data Center Platforms

	Hybrid Storage Platforms	
		
	Ultrastar Data60	Ultrastar Data102
Storage Type	HDD	
Interface	SATA/SAS	
# Drives (up to)	60	102
Capacity (up to)	1.56PB	2.65PB
Dimension	4U	
Features	IsoVibe ArcticFlow	

OpenFlex Data Center Platforms

	NVMe-oF Storage Platforms	
		
	OpenFlex Data24	**OpenFlex Data24 3200**
Storage Type	SSD	SSD
Interface	NVMe (NVMe-oF) 2, 4, or 6 RapidFlex NICs	NVMe (NVMe-oF) 6 RapidFlex NICs
Connection Type	RoCE	RoCE or TCP
# Drives (up to)	24	24
Capacity (up to)	368TB	368TB
Dimension	2U	2U

RapidFlex Data Center Fabric Bridge

	NVMe-oF Controllers	
	 RapidFlex A2000	 RapidFlex C2000
Device Type	ASIC Fabric Bridge Device	Half-height / half-length NVMe Adapter
Network Interface	vDual Ports 100 / 50 / 25 GbE	
PCIe Interface	PCIe Gen 4 x 16 lanes	
NVMe Capability	NVMe 1.4 Compatible NVMe-oF 1.1 Compatible TCP and RoCEv2	
Dimension	25mm BGA	129.41mm x 68.95mm
Features	Bridges NVMe to NVMe-oF running on Ethernet Fabrics Enables Composable Disaggregated Infrastructure (CDI)	

Ultrastar Transporters

	Edge Servers	
		
	Ultrastar Edge	Ultrastar Edge-MR Ruggedized Edge Server
Device Type	Transportable Edge Server	Ruggedized Edge Server
Maximum Storage	8 Ultrastar DC SN640 NVMe SSDs 7.68TB per SSD, 1 DW/D, ISE (Instant Secure Erase)	
Network Interface	Dual 10GBase-T RJ-45 Mellanox® ConnectX®-5 100GbE QSFP28	
Physical Security	FIPS 140-2 Level 2	
Management	IPMI 2.0 system management Dedicated DB9 Serial management port	
Dimension	2U	**Edge Server:** 2U **Ruggedized Case:** 292mm x 609.6mm x 952.5mm / 11.5in x 24in x 37.5in

[1] One gigabyte (GB) is equal to 1,000MB (one billion bytes) and one terabyte (TB) is equal to 1,000GB (one trillion bytes) when referring to solid-state capacity. Accessible capacity will vary from the stated capacity due to operating environment.[2] Endurance rating based on DW/D using 4KiB random write workload over 5 years.

[2] Endurance rating based on DW/D using 4KiB 100% random write and JESD 219 workloads over 5 years.

[3] Based on internal testing. Performance will vary by capacity point, changes in useable capacity, or security option. Consult product manual for further details. All performance measurements are in full sustained mode and are peak values. Subject to change.

[4] MTBF and AFR specifications are based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions for this drive model. MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

[5] Idle specification is based on use of Idle_A

[6] Based on internal testing; performance may vary depending on host environment, drive capacity, logical block address (LBA), and other factors. 1MiB = 1,048,576 bytes (2^20), 1MB = 1,000,000 bytes (10^6)

[7] Final MTBF and AFR specifications will be based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions, typical workload and 40°C device-reported temperature. Derating of MTBF and AFR will occur above these parameters, up to 550TB/year and 60°C (device reported temperature). MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

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