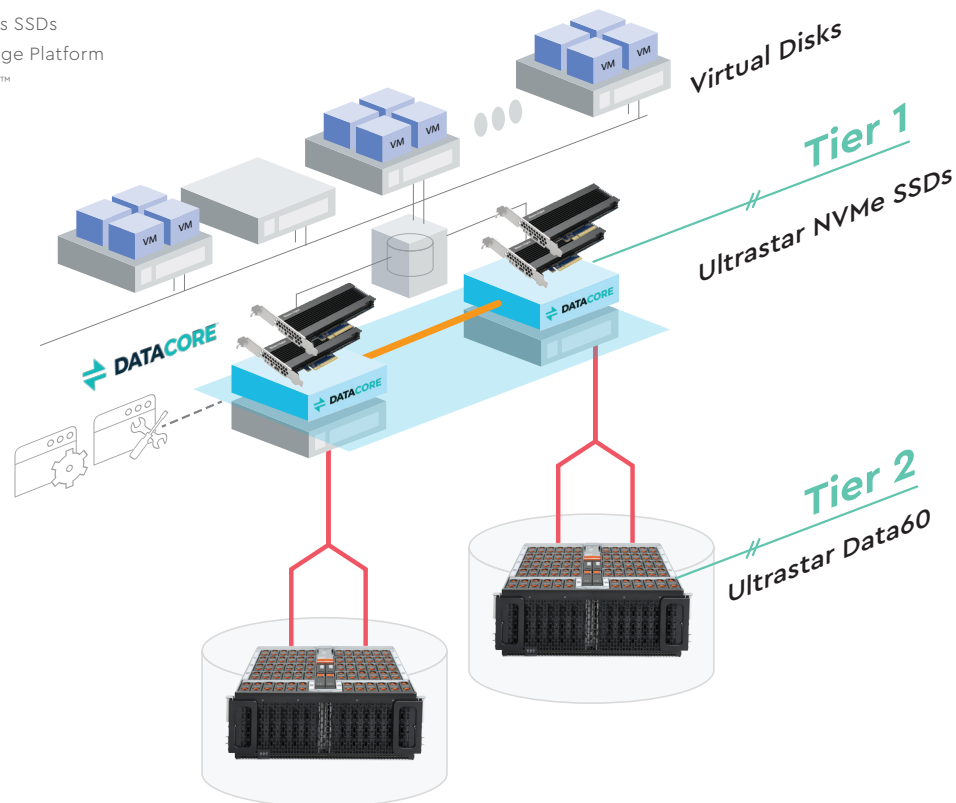Western Digital.

DATACORE

Tiered Hybrid Storage Solution

Tier 1: Ultrastar® NVMe™ series SSDs
Tier 2: Ultrastar Data60 Storage Platform
SW: DataCore SANsymphony™

This is an ideal solution for medium-to-large-sized enterprise workloads with high capacity demand. The solution provides excellent availability and medium performance at a very low TCO. The 2 tiers of storage allow data to be moved in real time to an appropriate storage layer that always provides the right performance at the right time for any data set.

To create a high-performance multi-tiered storage solution, it takes two mirrored server nodes with SATA (OS boot) and NVMe SSDs (data storage) and 2 JBODs with SAS HDDs. This reference architecture uses Ultrastar NVMe series SSDs, connected to 2x Ultrastar Data60 storage platform. The Datacore SANsymphony software runs on a server with Intel® Xeon® Gold 5120 Processors.

For purposes of server sizing, the PCIe bus is used to install backend and frontend controllers. A Broadcom® HBA 9480–8i8e Tri-Mode Storage Adapter is used to connect the Ultrastar Data60 storage platform to the servers. The QLogic® HBA controllers are used to interconnect the servers and connect the servers to the SAN.

The DataCore Ready servers can each contain up to 24 Ultrastar NVMe SSDs as a Tier-1 in the Auto-Tiering storage pool and 2 Ultrastar SATA SSDs for the Windows Server 2016 operating system. Minimum configuration for the servers is 12 Ultrastar NVMe SSDs, with maximum total capacity of 92TB of NVMe flash storage (fully populated).

The Ultrastar Data60 can be equipped with Ultrastar SAS HDDs, providing a data repository of up to 1.4PB in a 4U storage rack. Minimum configuration is 24 HDDs, providing an upgrade roadmap of up to 60 drives. If an additional performance tier is required, it is possible to install up to 24 SAS/SATA SSDs.

The DataCore SANsymphony software requires both DataCore SANsymphony EN-Node licenses (free to request and download) and at maximum 904 Datacore TB Capacity license. The actual amount of TB Capacity licenses is dependent on the total managed storage capacity in the configuration.

Note: After reaching full drive bay population of the various chassis in this configuration, further expansion is possible by simply adding additional Ultrastar Data60 and/or 2U24 Flash Storage Platform to the existing SAS loops and upgrading DataCore TB Capacity license to the new total amount of managed capacity. It is possible to have up to 8 external storage shelves per server (4 shelves per SAS loop) in total, ranging up to almost 7PB of managed capacity per server.

[1] One megabyte (MB) is equal to one million bytes, 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 storage capacity. Accessible capacity will vary from the stated capacity due to formatting, system software, and other factors.

Per Server Configuration (2 Servers needed)

Item	Description	P/N	Qty
Server	DataCore Ready x86 Server		1
CPU	Intel® Xeon® Gold 5120 Processor	Intel Xeon Gold 5120 Processor	2
Memory	16GB PC4–21300 2666MHz DDR4 ECC Registered DIMM	1EX1407	12
System Disk	Ultrastar DC SA210 480GB SATA SSD	0TS1650	2
2.5" SATA/SAS Drive Trays	Tool-less black hot-swap 2.5 HDD drive tray (Red tab)	N/A (server base config)	2
VROC	SVR2U24 Option RAID VROC Premium Key	1EX1177	1
RAID controller for boot devices and expansion	Broadcom 9480–8i8e	SC-9480–8I8E	1
NVMe Cache	Ultrastar DC SN620 NVMe SSD	0TS1844 (3.84TB)	12
HBA for host connection	Qlogic 16Gb quad port Fibre Channel HBA	1EX1612	2

Storage expansion per Storage Server (2 expansions needed)

| Item	Description	P/N	Qty
Tier-2 JBOF	Ultrastar Data60 Storage Platform (with 144TB SAS HDD as example)	1ES1169 (24×6TB SAS 512e HDD, total 144TB) or 1ES1167 (24×6TB SAS 4kn HDD, total 144TB)	1
SAS cable	Ultrastar Data60 Cable IO HD mini-SAS to HD mini-SAS 3m 2Pack	Included in the Ultrastar Data60 platforms	2

Software

Item	Description	P/N	Qty
Operating System	Windows Server 2016 Standard	OEM SKUs from server vendor	2
DataCore SW	SANsymphony EN-Node license	Free to request and download	2
No RAID overhead	Datacore TB Capacity license (1-year maintenance)	DEN-EWR-S12–250	380
	Datacore TB Capacity license (3-year maintenance)	DEN-EWR-S36–250	380
RAID-1 for data protection within the individual nodes	Datacore TB Capacity license (1-year maintenance)	DEN-EWR-S12–100	190
	Datacore TB Capacity license (3-year maintenance)	DEN-EWR-S36–100	190

Note: Any other RAID usage that would result in other managed net capacity will change the SKU accordingly;
Note: Any already existing EN capacity anywhere else will also change the SKU, depending on the total managed capacity;
Note: Above capacity figure calculation is based on minimum capacity configuration for all storage components resulting in 380TB raw capacity;

P/N scheme for **Nx** Datacore TB Capacity license DEN-EWR-S**xx-yyy** is as follows:

N	Total new managed capacity of the customer represented by the servers and the storage capacity added
xx	Maintenance term, i.e. 12 = 1 year / 36 = 3 year.
yyy	Total managed capacity band, after the new capacity is purchased 001 = 1 to 9 TB 010 = 10 to 24 TB 025 = 25 to 49 TB 050 = 50 to 99 TB 100 = 100 to 249 TB 250 = 250 to 499 TB 500 = 500 to 999 TB 01M = 1000 and above
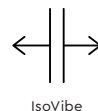
IsoVibe

IsoVibe Vibration Isolation Technology

Precise cuts in the baseboard provide a suspension for the drives in the chassis, isolating them from transmitted vibration. The result is that consistent performance is maintained, even when all the drives are working hard.

ArcticFlow

ArcticFlow Thermal Zone Cooling Technology

By introducing cool air into the center of the chassis, drives operate at lower and more consistent temperatures than conventional systems. This results in lower fan speeds, reduced vibration, lower power consumption, quieter operation and ultimately higher reliability.

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