Western Digital.

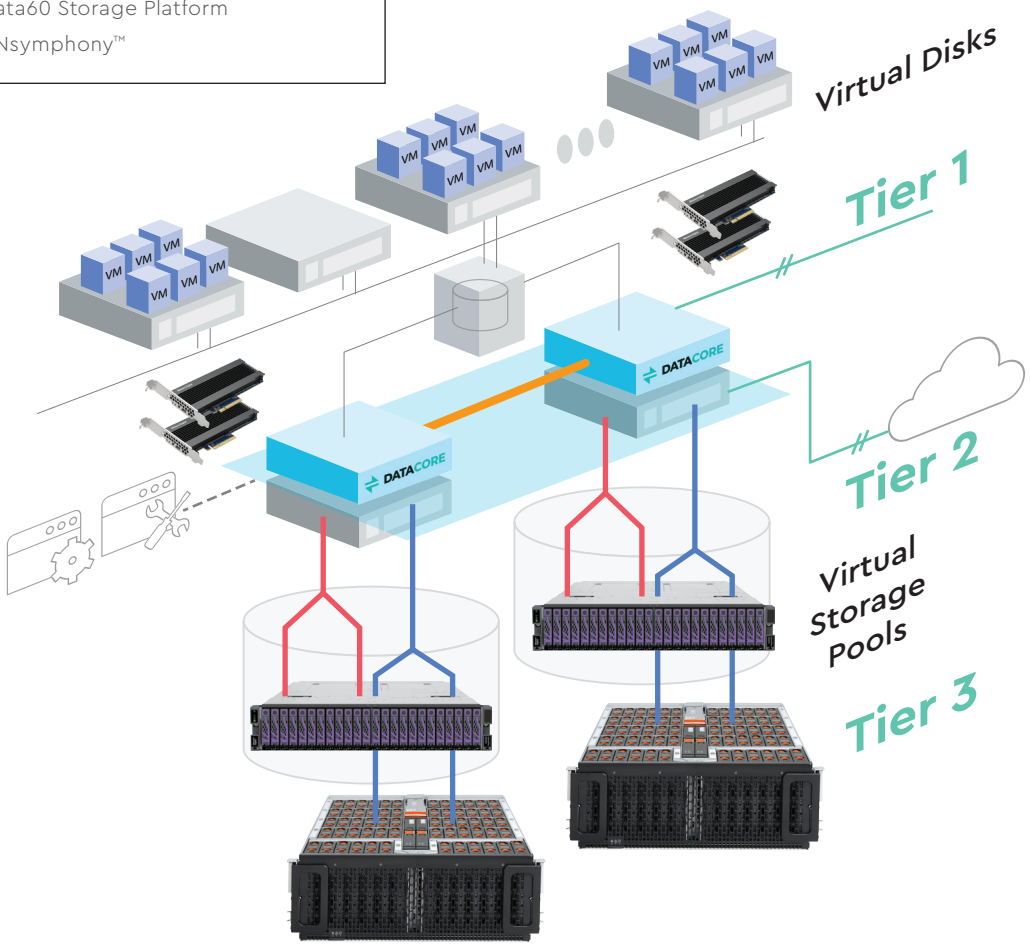
DATACORE

REFERENCE ARCHITECTURE AUGUST 2020

High Performance, High Capacity Scalable Storage Solutions

Western Digital and DataCore have partnered up to provide you with a wide range of high performance, easily scalable and cost effective storage solutions for your enterprise workloads.

Tier 1: Ultrastar® NVMe™ series SSDs
Tier 2: OpenFlex™ Data24 NVMe-oF™ Storage Platform
Tier 3: Ultrastar Data60 Storage Platform
SW: DataCore SANsymphony™



The Benefits of Uncompressed Data Storage

There are many reasons why an uncompressed storage solution is the preferred choice in comparison to appliances that leverage compression and deduplication.

1. **Lower latency, fewer CPU cycles, less power and more robust error handling:** Databases are very suitable for compression, because of repeating pattern and structures. However, compression can negatively impact the performance of databases by the added latency and CPU cycles. When compression reaches a certain factor, the number of bit errors grows by the same factor.
2. **Non-compressible data:** Many applications are storing post production content that will already be compressed and cannot be compressed any further.
3. **Data security:** Driven by the desire to protect data at rest, CIOs will want to encrypt critical data under their management, but encrypted data is incompressible by nature.
4. **Data migration:** Compression methodology varies from system to system. It is therefore possible that a Direct Attached Storage extension from one system will not be interpreted correctly by a future system. In other words, data migration to a new system will only work for as long as the original system is up and running.
5. **Flash wear out:** Many systems, offering compression, need to store all data uncompressed at first to compress it in the background later. As these system age and gradually fill up, the daily ingest volume capacity keeps shrinking and writing all data twice burns flash program cycles.
6. **Deduplication:** Customers, storing similar data structures like container images or client snap shots, can benefit greatly from deduplication because all OS related files and many others are likely to be identical. The loss of one of these OS files from the backup pool which relates to multiple images and snap shots, will render all related image—and snap shot-backups useless.

Scalable Storage Solutions

Western Digital and DataCore have put together four different reference architectures, providing a variety of performance and capacity for your various storage needs:

1. **All-Flash:** This is an ideal solution for compute intensive workloads that provides excellent availability and ultra-high performance at a very low TCO. Datacore SANsymphony software runs on two mirrored x86 servers boosted with Ultrastar NVMe SSDs to create a high performance all-flash NVMe-based processing and storage solution.
2. **Tiered All-Flash:** The configuration above can be expanded by adding two OpenFlex Data24 NVMe-oF storage platforms to the setup, as Tier-2. This makes it an ideal solution for medium to large-sized enterprise workloads seeking all-flash performance at an attractive price. The two 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.
3. **Multi-Tiered Hybrid:** The configuration above can be further expanded by adding two Ultrastar Data60 JBODs to the setup, as Tier-3. This hybrid configuration provides an ideal solution for medium to large-sized enterprise workloads with high capacity and high performance demands. Through auto-tiering, the three tiers of storage allow data to be moved transparently to the appropriate storage layer that provides the right performance for the level of demand seen by the system.
4. **Tiered Hybrid:** For workloads that require a large amount of data storage capacity but don't need a lot of SSDs for performance, adding two Ultrastar Data60 JBODs to the base All-Flash configuration provides excellent availability and medium performance at a very low TCO.

Western Digital Platform Storage Solutions

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

The OpenFlex Data24 NVMe-oF storage platform can be equipped with up to 24 Ultrastar SAS SSDs with a maximum total capacity of 368TB of flash storage (fully populated).

The Ultrastar Data60 can be equipped with Ultrastar SAS HDDs, providing a data repository of up to 1.2PB in a 4U storage platform. Minimum configuration is 24 HDDs, providing an upgrade path up to 60 drives. If an additional performance tier is required, it is possible to mix in up to 24 SAS/SATA SSDs.

DataCore SANsymphony

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

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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[1]One gigabyte (GB) is equal to 1,000MB (one billion bytes) and one terabyte (TB) is equal to 1,000GB (one trillion bytes) and one petabyte is equal to 1,000TB. Actual user capacity may be less due to operating environment.