Solution Brief
End-to-End Business Continuity Solution for Your All-Flash Data Storage Servers

ATTO The Power Behind the Storage

open-e

> Use the power of ATTO, Western Digital®, and Open-E JovianDSS to build a bullet-proof Business Continuity Solution

KEY BENEFITS:

→ Best-in-Class **ATTO** and **Western Digital®** hardware components and outstanding **Open-E JovianDSS** software

→ **Up to 1.3 PB capacity backup storage** for high-performance All-Flash Data Storage Systems

→ **Budget efficiency** due to the HDD-based backup storage

→ **Data storage software compatibility**, thanks to the Open-E JovianDSS certification

→ **Non-Shared Storage High Availability Cluster with JBOD** connected through the 3rd node

BACKUP FOR:

Critical data storage appliances

High-performance applications

Virtualized environments

Database-optimized storage

Video postproduction and imaging

EXECUTIVE SUMMARY

The collaboration between data storage engineers and experts from Western Digital®, ATTO, and Open-E has paid off with the cutting-edge solution that protects your data against possible disasters and enables avoiding failures. Use the **Western Digital® Ultrastar® Data60 JBOD** fully equipped with the **Western Digital® Ultrastar® HDDs** connected with **ATTO ExpressSAS GT HBA** adapters to build a backup system with the **Open-E JovianDSS On- & Off-Site Data Protection** feature. Such a solution can serve as the 3rd node for your All-Flash Data Storage Cluster providing ultimate data security based on the read-only data snapshots (ransomware effects protection) and geographically distributed data copies (natural disasters and energy outage protection).
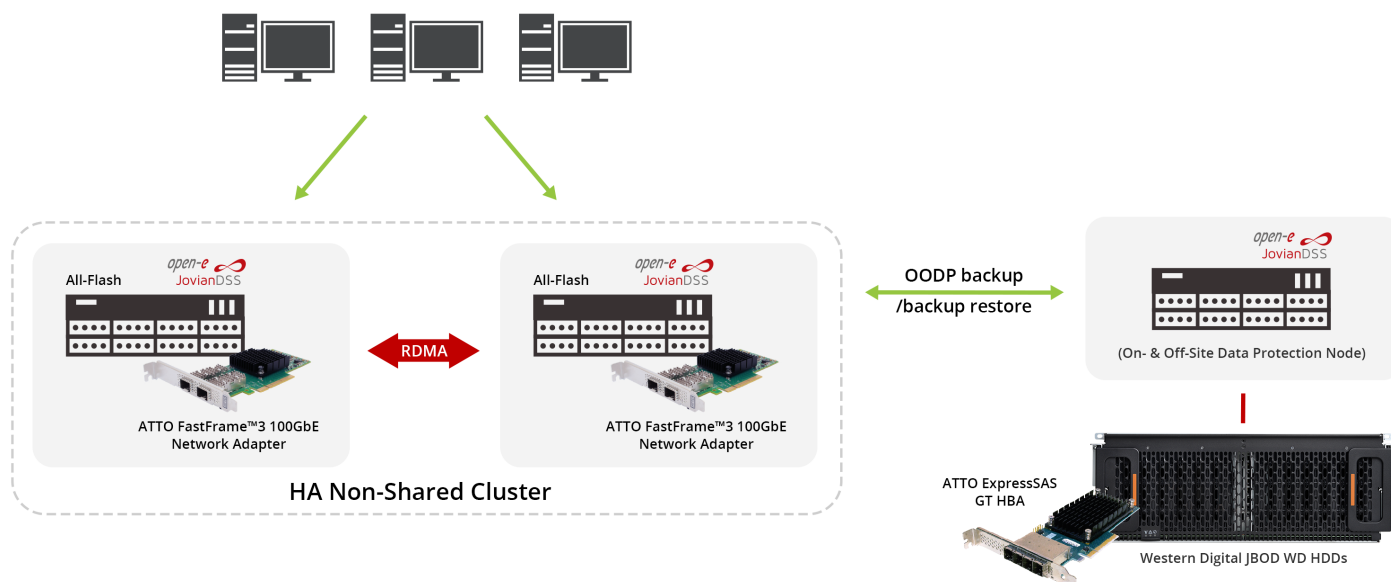
CUSTOMER NEEDS

High-performing All-Flash Data Storage systems based on SSDs, or even super-fast SSD NVMe drives, as well as extra fast networking solutions with the RDMA (Remote Direct Memory Access) connection, are becoming the industry standard. Extremely high IOPs and ultra-low latency levels are the key requirements to create data storage **for resource-hungry applications such as virtualization, high-performance AI or Machine Learning implementations**, and more. But when it comes to critical business appliances, apart from the performance, we need to ensure business continuity and a disaster recovery plan in case of any potential disruption. A wide range of potential threats,

such as human errors, ransomware attacks, hardware failures, and natural disasters, makes it challenging, especially when the amount of data that needs to be backed up is growing, and we're looking for a budget-efficient solution.

To meet this challenge Open-E, Western Digital®, and ATTO joined forces to deliver an end-to-end backup solution. The solution combines the massive capacity of Western Digital® Ultrastar® Data60 JBOD populated with Ultrastar® HDDs with the power of ATTO HBA SAS controllers and 100GbE NICs and the flexibility of Business Continuity & Disaster Recovery features of Open-E JovianDSS.
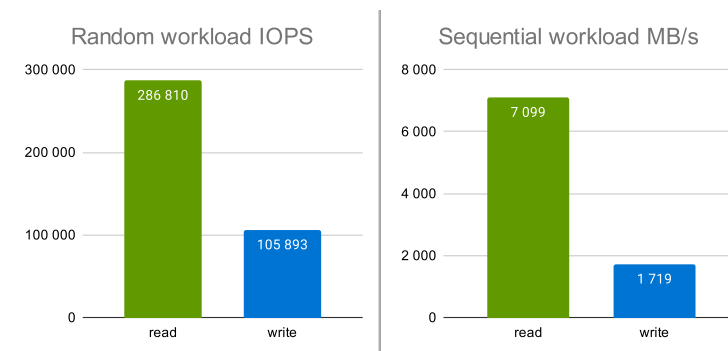
SOLUTION TOPOLOGY & DESCRIPTION

Western Digital® Ultrastar® Data60 JBOD is connected to the All-Flash NVMe High Availability Cluster (production server) through the 3rd node as a backup machine, using **ATTO ExpressSAS® GT HBAs**. The production server uses **ATTO FastFrame™3 100GbE** network cards for the client connection. For testing purposes, we have used the VMware virtualization platform. It can be used also with other hypervisors, as well as different business applications such as real-time data analytics, cloud computing, OLTP/OLAP databases, artificial intelligence (AI), machine learning (ML), and pattern recognition.

iSCSI Performance Results
Tested configuration: 10x6 drive RAID-Z2

Random workload IOPS
- read: 286 810
- write: 105 893

Sequential workload MB/s
- read: 7 099
- write: 1 719

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[1] ZFS configuration details: auto trim: yes, write log: 2-way mirror replicated write log, read cache: single disk. ZFS parameters: zfs_vdev_max_active = 1000, zvol: 200 GB - volblocksize 64 kB; The rest of the parameters are default; zvols were initialized before tests. Dataset: sync=always. Record size: 64 kB, the rest of the parameters are default.
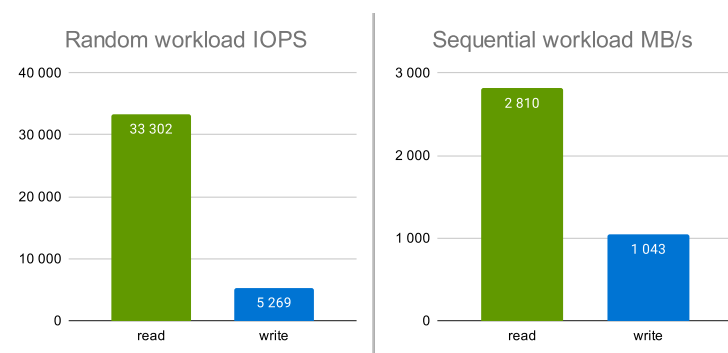
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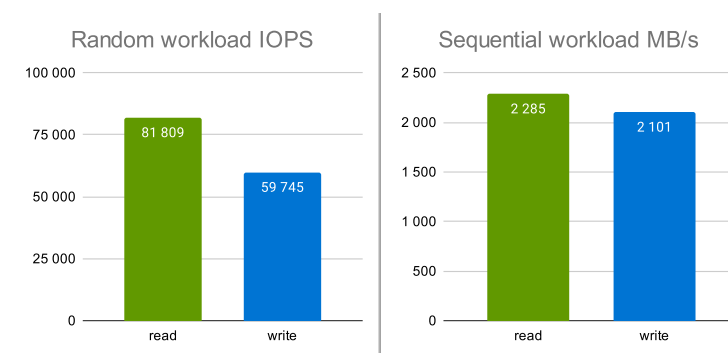
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NFS Performance Results
Tested configuration: 10x6 drive RAID-Z2

Random workload IOPS

	read	write
	33 302	5 269

Sequential workload MB/s

	read	write
	2 810	1 043

SMB Performance Results
Tested configuration: 10x6 drive RAID-Z2

Random workload IOPS

	read	write
	81 809	59 745

Sequential workload MB/s

	read	write
	2 285	2 101

HARDWARE SPECIFICATION

ATTO ExpressSAS® GT HBAs (H1244GT)

ATTO ExpressSAS GT HBA is a **4-Port External 4-Port Internal 12Gb/s SAS to PCIe 4.0 Host Bus Adapter** built to handle the scalability and availability needs for the next generation of data processing.

- The ExpressSAS® GT line's PCIe 4.0 capabilities **increase user bandwidth resulting in reduced downtime and improved efficiency**.
- With unique ATTO features and extensively tested hardware, you can expect a performance-engineered product with data protection and management at no extra cost.
- Provide the ability to develop unique, quick-to-market solutions with Open-E JovianDSS support.

ATTO FastFrame™3 100GbE NICs

ATTO FastFrame™3 100GbE NICs are suitable for a wide variety of high-performance applications and provide a high-quality and high-performance experience. ATTO NIC supports the Ethernet standard in a single- or dual-port configuration.

- **ATTO FastFrame™3 NICs and Open-E JovianDSS are certified to support RDMA for mirroring path.**
- The brand-new Ethernet Suite for Windows & Linux.
- Built-in hardware offloads.
- Erasure coding offload.

Western Digital® Ultrastar® Data60 Storage Platform

The Western Digital® platform provides up to 1.3 PB of raw storage using DC HC570 22TB CMR HDDs in a compact and efficient form factor. Ultrastar® Data60 addresses the demanding storage needs of large enterprise customers, as well as cloud service providers, requiring dense, shared HDD.

- **Low power consumption** leveraging WDC Helioseal® and ArcticFLow™ technologies.
- **Stable throughput performance** from IsoVibe™ under all workloads.
- **Lower return rate** from a cool and vibration-free operating environment.
- Easy serviceability and **component hot-swap capability.**
- Versatile connectivity with 2x6 miniSAS HD ports, offering: redundant connections and expansion of storage capacity by additional daisy-chained JBODs.
- Enabling multi-server access for instant failover.

Western Digital® Ultrastar® TB 3,5" SAS HDD Family

The Western Digital® Ultrastar® series HDDs enable an incredible capacity to maximize data storage, especially in footprint- and power-constrained environments. Performance-optimized for heavy application workloads

- CMR recording format.
- Helioseal® technology for low power and longevity.
- 20 and 22 TB versions with OptiNAND TM EPO-protected write caches .
- Projected 2.5M h MTBF at workloads of 550TB per year

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[2] IOmeter details: version: iometer-2006.07.27, outstanding IOs: 128. test size: 8 GB, block size: 1 MB (sequential) / 4 kB (random).

and a 5-year limited warranty to meet strict data center reliability requirements.

Open-E JovianDSS Data Storage OS System

With Open-E JovianDSS you can achieve advanced levels of data protection since you can utilize not only a High Availability clustering to ensure zero-downtime data accessibility but also consistent data snapshots that can be stored both locally and remotely on the external backup machine. This way you can build your Business Continuity strategy against all the threats such as hardware failures, power outages, human errors, ransomware attacks, natural disasters, and much more.

- Consistent Data Snapshots & Flexible Retention Plans.
- On- & Off-Site Data Protection.
- High-Availability Clustering.
- Hardware agnostic software certified for both Western Digital® and ATTO.
- RDMA support for mirroring path in non-shared storage nodes.

CONCLUSIONS

The outstanding Open-E JovianDSS flexibility in terms of data protection features, ensured by the On- & Off-Site Data protection, with the rock-solid Western Digital® hardware, and advanced ATTO cards, brings you an end-to-end Business Continuity and Disaster recovery solution. Thanks to it, **you can enjoy the highest performance levels of your All-Flash data storage, as well as peace of mind when it comes to the security of your data storage infrastructure**.

"Our long-term partnership with Western Digital® and ATTO gives us the opportunity to work closely with world-class data storage experts on the solutions that bring a brand-new value for our customers and resellers. And our latest project is a great example of this synergy" **- SAID KRISTOF FRANEK, CEO OF OPEN-E.**

"You couldn't pull together three better companies to partner on an end-to-end business solution like this. Each of us put our specialties on the table and the result is an amazing solution that stands out in the market" **- SAID TIM KLEIN, ATTO TECHNOLOGY CO-FOUNDER, PRESIDENT, AND CEO.**

"Once again I'm impressed by the ease of installation and smooth interaction of the three key storage technology elements making up this solution: Software-defined storage intelligence by Open-E, dependable network and SAS connectivity by ATTO and the high-density Ultrastar® storage platform made by Western Digital®" **- SAID MANFRED BERGER, SENIOR BUSINESS DEVELOPMENT MANAGER AT WESTERN DIGITAL®.**

Server	Intel M50CYP2UR
CPU	2x Intel Xeon Gold 6334 CPU @ 3.60GHz
RAM	16x 16GB Samsung M393A2K40DB3-CWE
NIC	ATTO FastFrame N312 Dual-Port QSFP28 100GbE
HBA	ATTO ExpressSAS H1244GT 4-internal 4-external 12Gb SAS/SATA
JBOD	Western Digital® Ultrastar® Data60 60-Bay Storage Platform (H4060-J)
Drives	60x Western Digital® DC HC510 (HUH721010AL4201) 10TB 3,5" SAS
OS	Open-E JovianDSS v.1.0 Up29r2
HA	Non-Shared Storage Cluster