ES-8700JCLB HA NVMe Cluster-in-a-Box

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** is a full-flash NVMe storage cluster that offers clients both, High Availability and accelerated performance. The system is fault-tolerant and powered by ultra-fast dual-port NVMe drives.

The ultra-fast NVMes are a perfect fit for enterprise-level environments which aim to deliver exceptional performance for mission-critical data storage applications while, at the same time, supporting their most demanding tasks, such as multithreading, virtualization, or relational database operations.

The High Availability clustering provides two active-active nodes with simultaneous, balanced data access. This significantly increases overall cluster performance. Additionally, when a failure does occur, the system can automatically execute the failover, allowing the secondary node to instantly take over all the processes and services of the primary one.

Advantages of the **EUROstor ES-8700JCLB NVMe cluster-in-a-box** include:

- "Cluster-in-a-box" system powered by ultra-fast Dual-Port NVMes
- High Availability, ensuring data is always accessible
- Support of up to 24 fast, large NVMe drives
- Lightning-quick RAM read and write caching
- Enhanced data storage performance
- Unlimited capacity, with volume sizes up to one Zettabyte

- "Cluster-in-a-box" System
- NVMe-Powered Storage Performance
- High Availability
- Guaranteed Data Protection
- Data integrity check
- Thin Provisioning
- Highly Scalable Solution
- Unlimited number of snapshots and clones

Flexible and Ultra-Fast Storage Solution

“Cluster-in-a-box” System

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** provides top-of-the-line protection from data storage system downtimes as well as data and revenue losses, thanks to unfettered access to data resources and critical business applications. This access isn’t interrupted by any hardware failures or planned maintenance tasks. This unique feature ensures an ever-present data connection between the two redundant nodes, and thanks to that connection, should one node fail, then the standby node can quickly take over, gaining access to everything needed for it to keep the system up and running. This “Cluster-in-a-box” architecture is enabled thanks to Open-E JovianDSS storage management functionalities.

NVMe-Powered Storage Performance

High-class, enterprise-level data storage has to provide a large amount of capacity while also being fast and reliable. This is exactly what the **EUROstor ES-8700JCLB NVMe cluster-in-a-box** offers. The system combines the capacity of fast, large NVMe SSDs with ultra-fast RAM read and write caching to create a flexible, all-flash-based solution that also offers high performance. This powerful system is able to handle Machine Learning or Artificial Intelligence applications, I/O heavy databases, or high throughput video editing, among other things, equally well.

High Availability

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** is the perfect option if you need to deploy a High Availability cluster setup for storing business-critical data. With the Open-E JovianDSS Standard High Availability Cluster Feature Pack, the **EUROstor ES-8700JCLB NVMe cluster-in-a-box** ensures reliability and redundancy through failover in case of any failure. Open-E JovianDSS also includes an independent Virtual IP (VIP) address feature. With this feature, VIPs can be used by multiple servers and flexibly switched at all times. When a hardware failure is detected, VIPs are automatically moved from the first node to the second one without any risk of the client servers timing out.

Data integrity check

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** effectively detects data corruption and corrects even minor integrity violations because, if left unchecked, even minor integrity violations could cause data loss. The system ensures reliability by check-summing individual blocks of data and, once faulty blocks have been detected, automatically rewriting them. If the same error is found several times over, the data blocks are rewritten to different parts of the drives. Each read/write is checked automatically. You can also manually schedule performance checks on any blocks that aren’t automatically checked. All changes are made using atomic writes to ensure the consistency of your data and to reduce the risk of data loss, even from unexpected events like power cuts.

Guaranteed Data Protection

Data is your most important resource. This is why the **EUROstor ES-8700JCLB NVMe cluster-in-a-box** includes several features to ensure that your data is protected. These features include things like both, automatic and manually-scheduled multi-layer data integrity checks, which both help to ensure data consistency. The ability to create unlimited snapshots and clones, which, in turn, makes it easy to implement a disaster protection strategy and to instantly roll back to a previous point-in-time is another feature worth mentioning. There’s also a self-healing function that can be set to run on a customizable schedule. This function can fix any malfunctions that occur and automatically looks to restore the system to a state of full data redundancy whenever there’s a problem. And if a drive should ever fail, there’s a software-based spare disk function in place as well. This function offers a spare drive to several RAID arrays, saving you money on extra hardware without compromising on your data safety.

High Availability solution functionality test results

Functionality test name	Functionality test results [passed/failed]
Manual Failover	Passed
Automatic Failover triggering after network failure	Passed
Automatic Failover triggering after shutdown test	Passed
Automatic Failover triggering after reboot test	Passed
Automatic Failover triggering after power-off	Passed
Automatic Failover triggering after I/O test	Passed

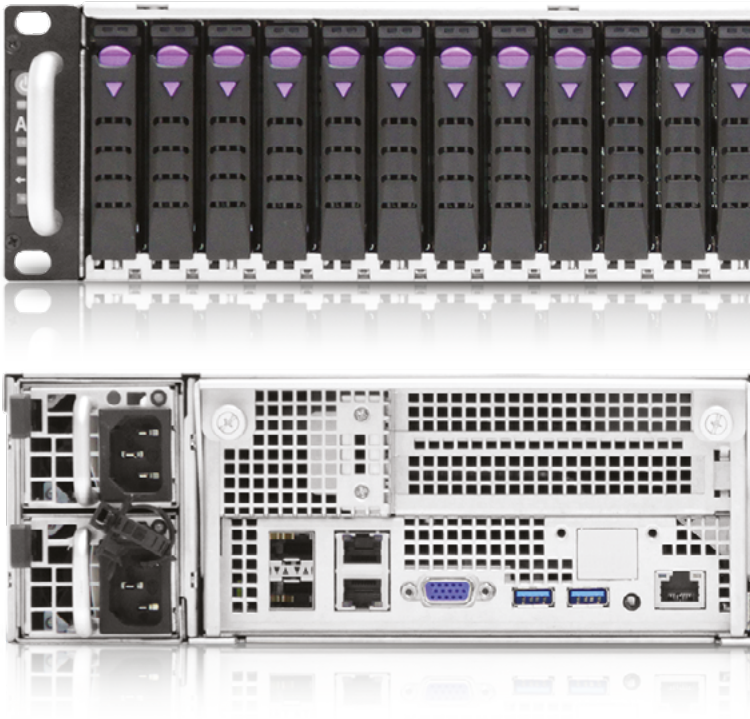
Active-active failover resource switching time test results

Total number of targets	Switching time [seconds]	Performance test results [passed/failed]
2	22	Passed
10	23	Passed
20	24	Passed

EUROstor ES-8700JCLB NVMe Cluster-in-a-Box

Thin Provisioning

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** uses thin provisioning to improve your storage utilization. This method of provisioning allocates the exact amount of server space required at the time it's required instead of allocating all the space in advance. By using thin provisioning, you can eliminate the cost of having to allocate storage space that remains unused for large tracts of time. This means that you'll never again have to pre-allocate storage upfront or buy too much hardware. There's no more need for you to evaluate storage requirements or to take the risk of having to rebuild the entire system should it run out of space. With this system in place, managing storage capacity and setting up notifications to be notified when available space shrinks is as easy as pie.



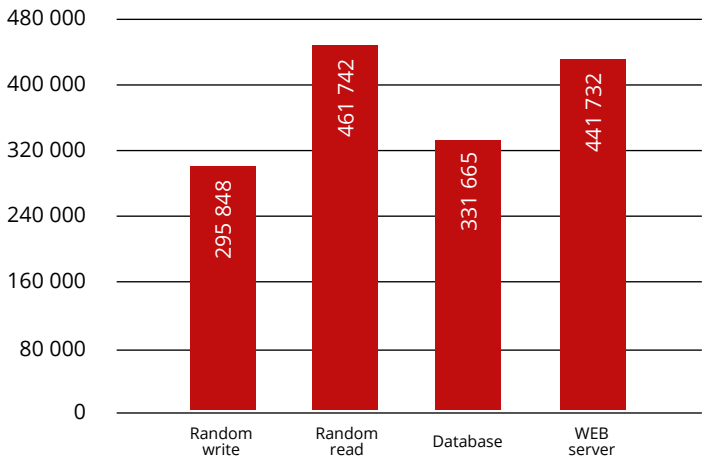
Highly Scalable Solution

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** lets you experience unlimited flexibility and minimizes any unwanted downtime. It also includes Open-E JovianDSS, which uses a 128-bit file system that provides features like unlimited snapshots, for easy data restoration, unlimited clones for easy duplication, and unlimited capacity with volume sizes all the way up to one Zettabyte. There are no limitations and you can easily control the total cost of ownership while also effortlessly expanding your storage infrastructure as data demands grow.

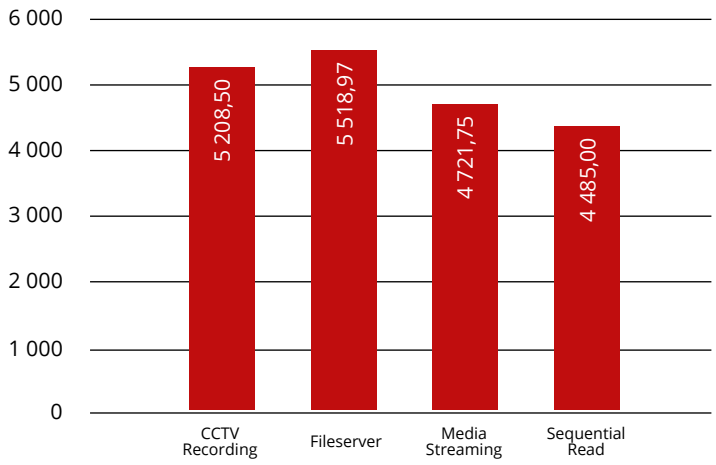
Unlimited number of snapshots and clones

The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** allows for an unlimited number of snapshots and clones to be taken. This greatly simplifies back-ups, replication and data recreation in case of any malware attacks or accidental deletions. A snapshot is a read-only collection of data that lets you easily roll back your system to the point in time when the snapshot was taken. They are a must-have option for effective disaster recovery. The **EUROstor ES-8700JCLB NVMe cluster-in-a-box** lets you create a snapshot retention plan to fit your needs. Snapshots can be taken as often as once per minute to as rarely as several months at a time. A clone, on the other hand, is a writeable, fully functional copy of a snapshot. Due to this full functionality, you can use clones to easily duplicate virtual machines and instantly scale out virtual networks, all without duplicating data.

IOPS *



Throughput [MB/s] *



* To achieve best performance, tests were performed with ZFS volume sync set to disabled.

Hardware details

For each of the 2 servers

	Default configuration	Options
Motherboard	AIC PAVO	-
CPU	2x Intel® Xeon® Gold 6240C CPU 2.60GHz	-
RAM	9x 16GB Micron 18ASF2G72PDZ-2G6B1	-
Storage raw capacity	19.2TB	-
Storage controller	Samsung Electronics Co Ltd NVMe SSD Controller 172Xa/172Xb	-
Storage device	24x 800GB Samsung PM1725a	-
Network controller	1x Intel® Ethernet Server Adapter I350-T2 1x Intel® Ethernet Connection X722-DA2	-
Form factor	2U	-
Boot medium	600GB WDC WD6000HLHX	-

Cluster in a box (specification per node - both systems had the same hardware installed). Single box solution has been applied here - a dual channel NVMe cluster has been used and there is no network latency since there is no Metro Cluster solution utilized here.

EUROstor

EUROstor has been a manufacturer of storage systems since 2004. Originally manufacturing RAID systems, today the main part of the product portfolio are server based systems, acting as flexible storage servers, tailor-made for the customers' needs.
Solutions range from small file servers and CCTV storage to high available storage clusters, scale-out clusters and cloud solutions.
EUROstor is located in Filderstadt near Stuttgart (Germany) and sells to professional end users all over Europe, SMBs, universities and research institutes and data centers.

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About Open-E

Open-E, founded in 1998, is a well-established developer of IP-based storage management software. Its flagship product Open-E JovianDSS is a robust, award-winning storage application which offers excellent compatibility with industry standards, and is the easiest to use and manage. Additionally, it is of the most stable solutions on the market and undisputed price performance leader.
Thanks to its reputation, experience and business reliability, Open-E has become the technology partner of choice for industry-leading IT companies. Open-E accounts for over 37,000 installations world-wide and has received numerous industry awards and recognition, also with its product Open-E DSS V7.
For further information about Open-E, its products and partners, visit http://www.open-e.com/

About the Open-E JovianDSS Server Certification

Open-E JovianDSS delivers software-defined storage which results in a wide variety of different hardware requirements such as performance, range, capacity, capability, and connectivity. To ensure compatibility and robust storage environments, all selected partners offer storage systems which are tested, benchmarked, and certified by Open-E. This way, customers are able to use solutions that require exceptional security and redundancy, without compromising performance.