# NAS deluxe

## open-e

## Starline NASdeluxe Z-series – HA SAS Shared Cluster

OPEN-E JOVIANDSS
CERTIFIED ★★★ CERTIFIED
open-e
HIGH AVAILABILITY
CERTIFIED CLUSTER

Benefit from scalable ZFS data storage with Starline Computer's NASdeluxe Z-Series and Open-E JovianDSS. This software-defined storage solution is well-suited for a wide range of applications. It caters perfectly to the needs of enterprises that are looking to deploy a flexible storage configuration.

Starline and Open-E can look back on a strategic partnership of more than 10 years. As the first partner with a Platinum partnership level, Starline has always been working hand in hand with Open-E to develop and deliver innovative data storage solutions.

In fact, Starline supports enterprises worldwide in managing and protecting their storage, with over 2,800 Open-E installations to date

By partnering with Starline and Open-E, you receive highly efficient and reliable storage solutions that offer:

• Great adaptability

• Tiered and all-flash storage systems

• High IOPS through RAM and SSD caching

• Superb expandability with Starline's high-density JBODs – without downtime

Starline's NASdeluxe Z-Series offers not only great features, but also great flexibility – thanks to its modular architecture.

> Guaranteed data protection
> Enhanced storage performance
> Flexible scalability
> Optimized for Data Centers
> High Availability
> Tiered RAM and SSD Cache
> Unlimited number of snapshots and clones
> Thin, Thick and Over-provisioning

# Powerful Starline NASdeluxe Z-series

## Enhanced storage performance

Nowadays, enterprise storage has to provide big capacity while also being fast, affordable and include reliable support. This is exactly what NASdeluxe Z-Series has to offer. Open-E JovianDSS-based NASdeluxe Z-Series is an innovative hybrid storage system fusing the capacity of HDDs with the performance of SSDs in a single solution that offers high performance while lowering cost. Additionally, by leveraging capacity optimization technologies and advanced tiered SSD and RAM caching, NASdeluxe Z-Series provides an overall efficiency boost and increased cache performance. On top of that, powerful tuning tools allow the system to optimize on I/O heavy databases or high throughput video editing equally well and predefined profiles save annoying testing time.

## Flexible scalability

The NASdeluxe Z-Series will let you experience unlimited flexibility and minimize unappreciated downtime. Open-E JovianDSS uses a 128-bit file system that includes unlimited snapshots for easy backup, unlimited clones for easy duplication, unlimited capacity with volume sizes up to one Zetabyte, as well as unlimited amount of disks which can be increased on the fly without effort by using thin provisioning. There are no limitations and you may easily control the total cost of ownership and expand your storage infrastructure as data grows.

## Certification notes:

That system was certified using QLogic QLE2672-CK Fibre Channel Adapter. Intel Ethernet Controller X722 provided in this system was used as Cluster management connection therefore we performed stability and compatibility tests on QLogic FastLinQ QL4100 only, confirming that this card will not pose any issues with Open-E JovianDSS.

## 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 |

## Guaranteed data protection

Data is your most important resource. This is why the Open-E JovianDSS-based NASdeluxe Z-Series includes several mechanisms for data protection. Automatic and scheduled multi-layer data integrity checks ensure data consistency, while unlimited snapshots and clones make it is easy to implement a disaster protection strategy and to instantly roll back to a previous point-in-time. At the same time, a scheduled self-healing mechanism fixes malfunctions and automatically restores full data redundancy in the system. Even when a disk fails, the software-based spare function offers one disk to several RAID arrays, saving you money on extra hardware without compromising data safety.

## Optimized for Data Centers

NASdeluxe Z-Series is optimized for the modern data center, ready for compute-intensive applications that involve big data, intensive virtualization workloads and higher-density server configurations. It allows administrators an intuitive management of storage infrastructures and maintaining continuous operations during updates or refreshes. By choosing NASdeluxe Z-Series you benefit from flexible CPU power, Fibre Channel connections, networks running 1, 10, 25, 40, 50 or 100 Gb Ethernet, as well as knowledge and experience of Starline in NASdeluxe Z-Series and developing solutions specialized for datacenter.

## High Availability

The NASdeluxe Z-Series is a perfect option if you are looking to deploy a High Availability SAS Cluster setup with Fibre Channel (FC). With the Open-E JovianDSS High Availability Cluster Feature Pack the NASdeluxe Z-Series ensures reliability and redundancy through failover in case of a failure. By using the cluster management software, all features related to the cluster setup can be quickly accessed and maintained - everything is in one place and guarantees ease of use for the storage administrator. Moreover, Open-E JovianDSS includes an independent Virtual IP (VIP) addresses feature. With this, VIPs can be used by multiple servers and flexibly switched at all times. When a hardware failure is detected, VIPs are automatically moved from one node to another without the clients noticing a timeout.

## Unlimited number of snapshots and clones

Every Open-E JovianDSS-based NASdeluxe Z-Series allows an unlimited number of snapshots and clones – greatly simplifying back-ups, replications and data recreation in case of accidental deletes or viruses. Snapshots are read-only points-in-time and allow for easy roll-back. They are a must-have option for effective disaster recovery scenarios and in NASdeluxe Z-Series you may schedule snapshots for months, weeks, hours or even minutes. Whereas, a clone is a writable copy of a snapshot and allows to easily duplicate virtual machines and scale out for virtual networks instantly and without duplicating data.

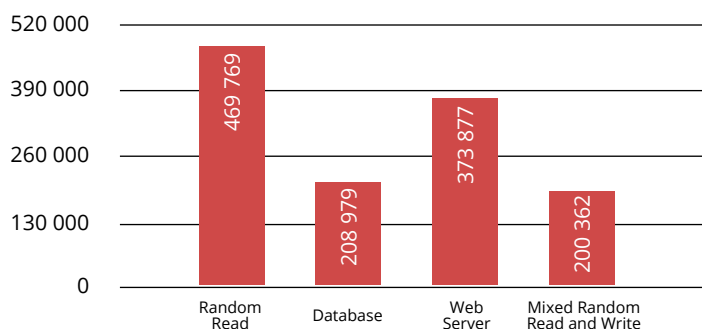## Thin, Thick and Over-provisioning

The NASdeluxe Z-Series uses thin provisioning to improve your storage utilization by allocating an exact amount of storage space at the required time. You'll eliminate the cost of unused storage space and never again have to pre-allocate storage up front and buy too much hardware. There is no need for evaluating storage requirements and taking the risk of rebuilding the entire system when it runs out of space. With NASdeluxe Z-Series it is easy to manage storage capacity and set notifications when physical space shrinks.

## Tiered RAM and SSD Cache

Open-E JovianDSS-based NASdeluxe Z-Series works as a tiered storage environment - dramatically speeding up access to frequently accessed files. It uses a caching algorithm to cache "often used" and "recently used" data separately, and provides the best performance for your storage by tiering hot data between RAM and SDD Cache. In  NASdeluxe Z-Series data is always saved on HDDs and only Hot Data is stored in RAM and SSD to ensure data safety and increase performance.
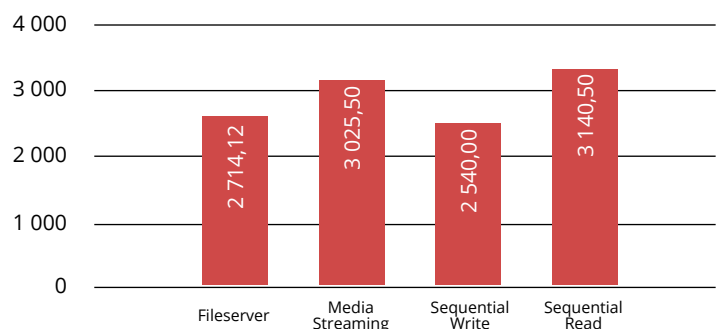
### IOPS

| | |
|---|---|
| 520 000 | |
| 390 000 | |
| 260 000 | |
| 130 000 | |
| 0 | |

| Random Read | Database | Web Server | Mixed Random Read and Write |
|---|---|---|---|
| 469 769 | 208 979 | 373 877 | 200 362 |

FC Active-Active

### Throughput  [MB/s]

| | |
|---|---|
| 4 000 | |
| 3 000 | |
| 2 000 | |
| 1 000 | |
| 0 | |

| Fileserver | Media Streaming | Sequential Write | Sequential Read |
|---|---|---|---|
| 2 714,12 | 3 025,50 | 2 540,00 | 3 140,50 |

FC Active-Active

# Hardware details

## Server heads NDL-5708
**For each of the 2 servers**

| | Default configuration | Options |
|---|---|---|
| Motherboard | Supermicro X11DPi-NT | - |
| CPU | 1x Intel® Xeon® Silver 4112 CPU 2.60GHz | Intel® Scalable Processor Serie (up to 28 cores per CPU) |
| RAM | 8x 16GB Micron MTA36ASF2G72PZ-2G6E1 | Up to 2TB DDR4 RAM |
| Storage raw capacity | 10TB | Scalable to Petabytes |
| Drive controller | 1x LSI SAS 3008-8E Host Bus Adapter | - |
| Fibre Channel | 2x QLogic QLE2672-CK Fibre Channel Adapter | 32 Gbit/s Fibre Channel |
| Network interface | 2x Intel® Ethernet Controller X722 for 10GbE<br>2x Cavium FastLinQ® QL41112HLRJ 10GbE Ethernet Adapter | More / other 1/10/25/40/50/100 GbE NICs |
| Form factor | 2U | Different chassis sizes available |
| Power | 2x 920W Redundant Power Supply | - |

## JBOD NDL-4224R/J

| | Default configuration | Options |
|---|---|---|
| HDD's | 18x 600GB Seagate ST600MM0099 | All certified SAS HDDs, NL-SAS HDDs, SAS SSDs |
| Read cache SSD's | 2x 1.6TB Seagate XS1600LE10013 | All certified SAS SSDs |
| Write log SSD's | 4x 800GB Seagate XS800LE10013 | All certified SAS SSDs |
| Form Factor | 2U | Different chassis sizes available |
| Power | 2x 1200W Redundant Power Supply | - |

![starline Computer GmbH logo — www.starline.de]

## Starline Computer GmbH

Starline Computer has more than 30 years of professional experience with data storage systems - having been in the storage and server business since 1982. We are one of the first companies to completely dedicate ourselves to storage and server solutions. This guarantees our partners a maximum of competence.
Starline provides complete virtualization and storage solutions such as SAN, RAID, NAS, IP storage, servers, tape libraries and autoloaders, RAID controllers, FC switches, backup software, HBAs and more.

## Partner Contact

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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 30,000 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.