Open-E JovianDSS

HYPERVISOR-AGNOSTIC
Data Storage Software

Dear Valued Partners and Customers,

In an ever-evolving landscape of virtualization technologies, adaptability and innovation remain paramount. The rapid pace of technological advancements has led to a proliferation of hypervisor platforms, each offering unique capabilities and catering to diverse organizational needs. However, this diversity has also presented challenges, as businesses grapple with compatibility issues, vendor lock-in, and the complexities of managing multi-platform environments.

At Open-E, we recognize these challenges as opportunities for innovation. Our hypervisor-agnostic software is designed to seamlessly integrate with leading virtualization platforms, providing businesses with the flexibility and freedom to choose the solutions that best suit their requirements. Whether you are utilizing VMware, Microsoft Hyper-V, or other virtualization technologies, our software ensures interoperability and ease of management, empowering you to optimize your IT infrastructure without constraints.

I invite you to explore this brochure and discover how Open-E can help you address the challenges and disruptions in the market for hypervisor-agnostic software. Together, let us embark on a journey towards a more flexible, efficient, and resilient IT infrastructure.

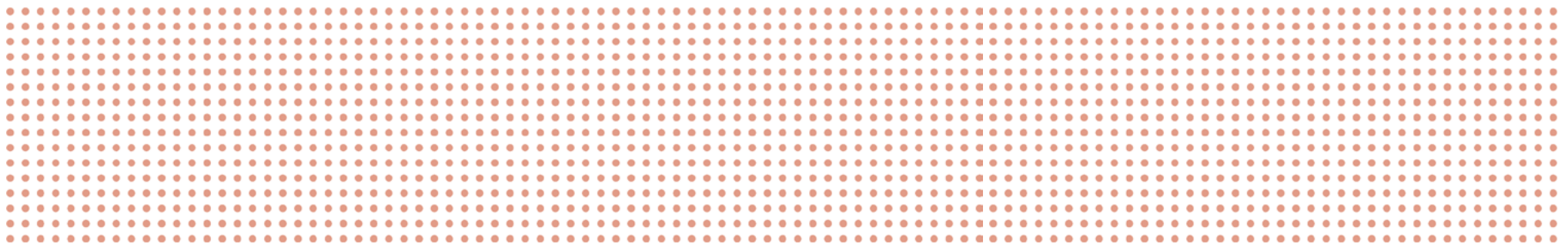Thank you for your continued support and partnership.

Sincerely,

Krzysztof Franek
CEO, Open-E

Table of contents

Hypervisor-agnosticism Benefits for Data Storage Systems
in 2024

Virtualization is one of the most efficient ways of configuring and controlling data storage, as it lets you flexibly manage the owned hardware and maximally utilize it to cover all your current needs. Yet, this kind of approach can be limited when tied to a given hypervisor.

What if you could avoid that and freely choose from a number of different hypervisors to build your data storage effectiveness? This level of flexibility can be achieved with hypervisor-agnosticism.

Our approach is simple - build and virtualize your system as you see fit!
Pick your hardware, choose a hypervisor, and combine them with a highly compatible software solution to create data storage free from vendor lock-in.

Welcome to our hypervisor-agnostic virtualization guide for 2024 and beyond!

Virtualization Saves Energy

Did you know that the transition from a traditional physical environment to a traditional virtual environment can save 20–80% of energy costs? And that's not all: the transition from a traditional virtual environment to Hyper-Converged Infrastructure can give you up to 31% of additional energy savings by integrating distributed data storage into your system.

HCI

Virtual ——— 31% more

Physical ——— 20% - 80% energy saving
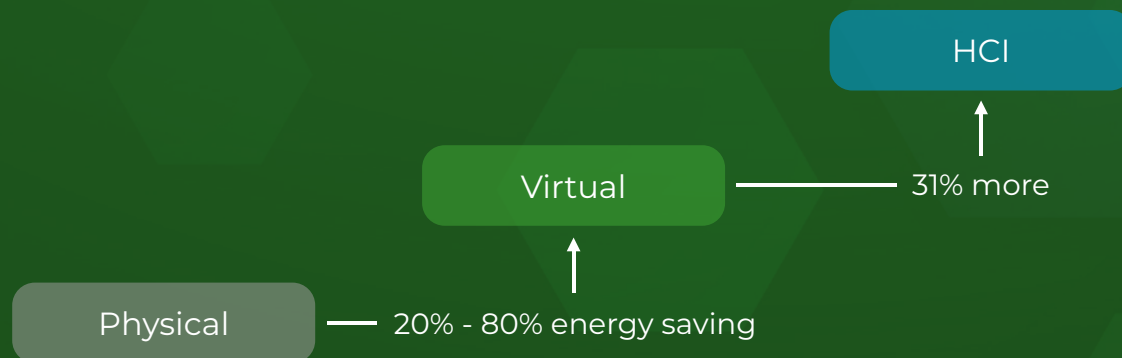
According to SmartX researchers and calculations

Check out our case study!

baierl + demmelhuber was looking for a reliable, fast, and secure solution to run a virtualized data storage infrastructure with **Microsoft Hyper-V** that could accommodate multiple operating systems and support applications such as AD/DNS, File&Print, database servers, application servers, ERP system, and terminal services. By choosing Open-E JovianDSS, they were able to create an active-active configuration that provided high data availability, seamless system maintenance capabilities, and more!

baierl + demmelhuber

We are absolutely happy with our new High Availability solution from EUROstor. The performance is excellent, and Open-E JovianDSS enables us to perform maintenance and updates anytime, without interruptions for users. Due to the fast storage based on SSDs, time-sensitive applications are running smoothly, and we have enough HDD storage space left for future growth of our data.

Michael Hackel,
Head of IT Infrastructure

# Additional Virtualization Benefits for Tough Times

Apart from the energy savings, there are many more advantages of virtualization that can be important during the sluggish economy time:

✔ A desirable resource-saving features:

→ **Thin Provisioning** enabled by virtualization reduces the allocated capacity

→ **Less hardware** is needed

→ **Full flexibility in resource management** for extra savings and scalability

✔ The fully-virtualized system simplifies the deployment of the new solution

✔ Virtualization makes many critical business processes faster. IT infrastructure becomes more secure and allows much faster disaster recovery.

Hyper-converged infrastructure

open-e
JovianDSS

Storage	+	**Networking**	+	**Virtualization**

Management

Storage
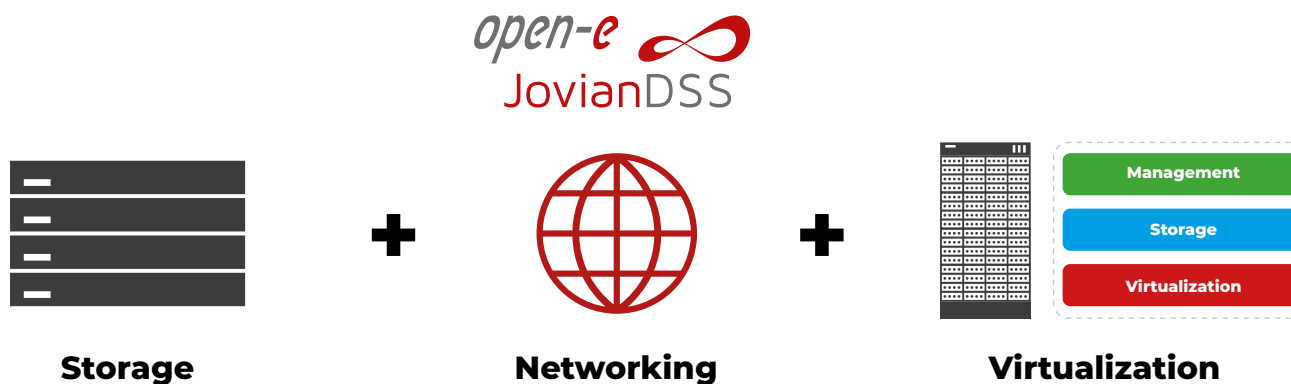
Virtualization

Open-E JovianDSS Hypervisor-agnosticism In Practice

As virtualization is one of the most effective data storage practices, you should be able to choose from a wide range of hypervisors to pick the one that most likely suits your preferences. That is exactly why we care about providing hypervisor-agnostic data storage solutions. In fact, 80% of Open-E implementations involve virtualization, whether it's data storage for virtualization or virtualized storage, and it supports VMware, Microsoft Hyper-V, ProxMox, Xen, XenServer, Citrix, XCP-ng, and more!

vmware®   **citrix**™   Microsoft **Hyper-V**   **X PROXMOX**

To address the unique storage needs of virtualized environments, we recommend several data storage topologies you can use to build your final solution.

Let's dive deeper into the implementation's details to understand how hypervisor-agnostic Open-E JovianDSS can provide scalable and reliable data storage solutions for virtualized environments.

Data Storage Back-end
for Hypervisor

Advantages:

+ Native (higher than virtualized) storage performance

+ A straightforward, easy-to-configure solution

+ More flexibility in terms of hardware and storage

infrastructure

Disadvantages

— More hardware required results in higher total costs

— More potential points of hardware failure
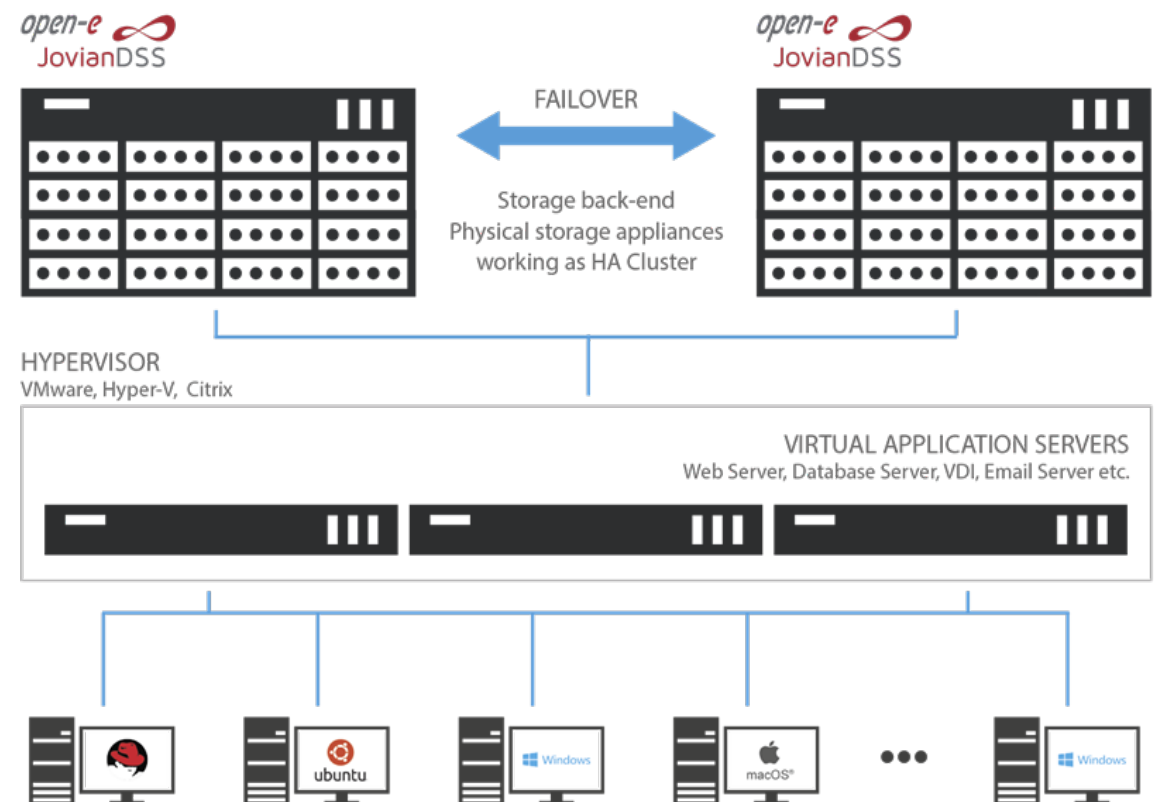
Virtualized Data Storage Back-end **within Hypervisor**

Advantages:

+ Convenient maintenance with full remote management

+ Faster deployment compared to a solution with hardware-based storage backend

+ Less hardware is required

Disadvantages

− Lower storage performance as the CPU is shared with the hypervisor, storage, and virtual machines

− Hypervisor is a single point of failure

Virtualized Data Storage Back-end within a HA Cluster Nodes Run **on Hypervisors**

Advantages:

+ Eliminates a single point of failure due to failovers between both the storage servers and the hypervisors.

+ Ensures uninterrupted operations in typical failure scenarios

Disadvantages

− Higher costs as it requires 2 physical servers
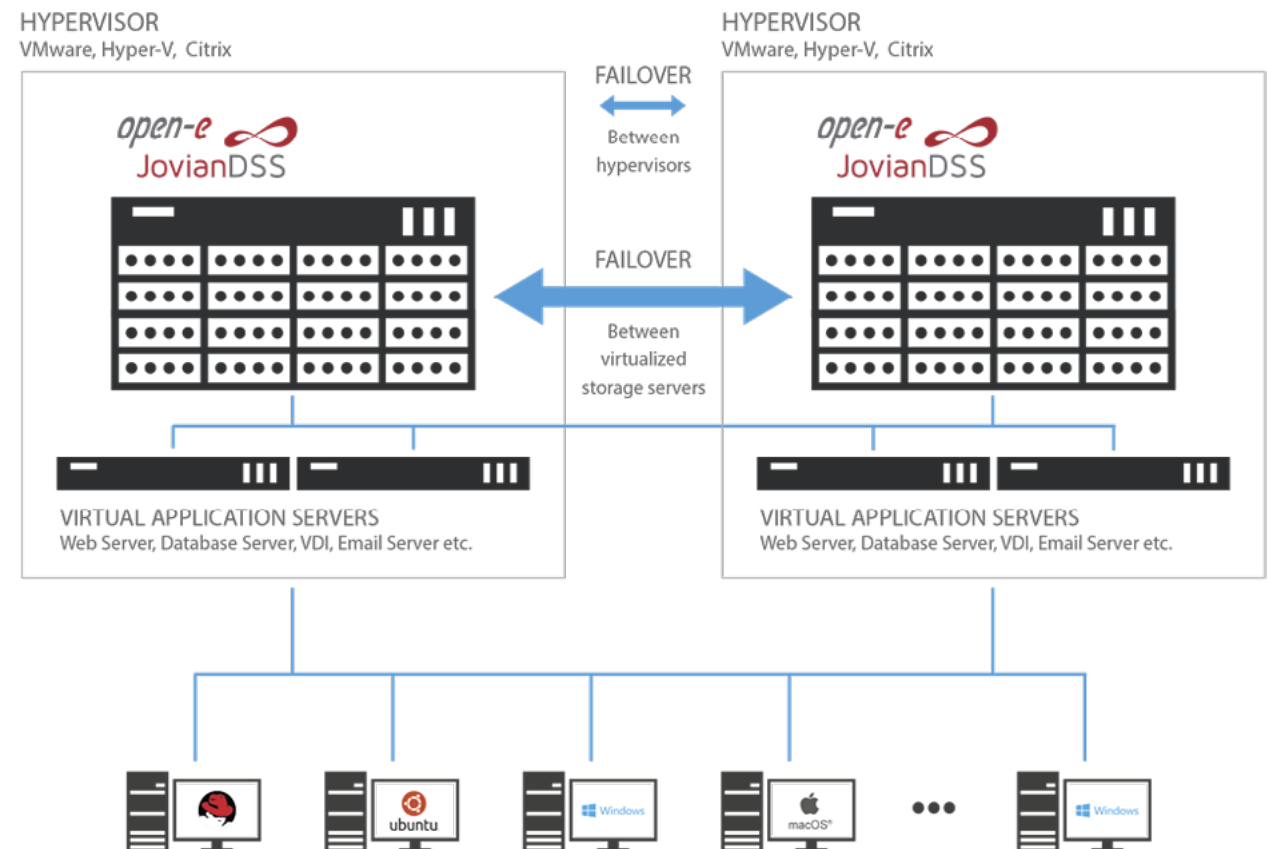
Data Storage Back-end in Fully Virtualized Hyper-Converged Infrastructure (HCI)

Advantages:

+ All infrastructure – including networking – is fully virtualized and, therefore, fully configurable

+ Less IT infrastructure complexity

+ Deploys on commodity hardware

+ Most efficient maintenance and management

+ Lowest TCO (Total Cost of Ownership) in many scenarios

Disadvantages

− Not suitable for all types of use, e.g., big data processing and others requiring the highest possible performance

HYPERVISOR
VMware, Hyper-V, Citrix

open-e JovianDSS   STORAGE SYSTEMS

NETWORK

VIRTUAL APPLICATION SERVERS
Web Server, Database Server, VDI, Email Server etc.
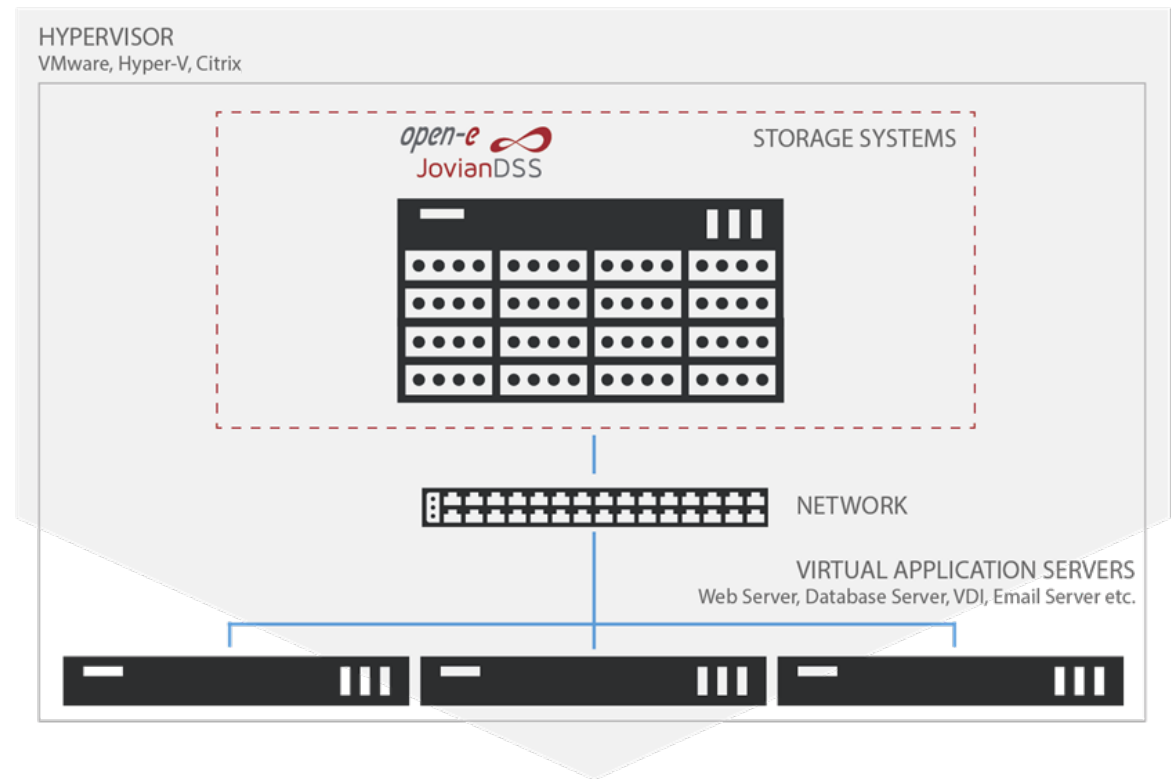
How to Optimize Your Open-E JovianDSS for Virtualization Purposes

In this part, we'd like to highlight the technical tips and recommendations for **Open-E JovianDSS as storage for virtualization**. We'll answer the following questions:

→ What challenges might you encounter during installation?

→ What are the hardware recommendations?

→ What are the technical tips and tricks?

Common Virtualization Challenges

When optimizing your data storage for virtualization you might encounter a couple of challenges. We have listed the most common issues reported by our customers:

→ **Too low IOPS**

→ **Disks with too high latency are used**

→ **Poor overall performance of storage servers caused by wrong hardware used**

→ **Insufficient total network layer throughput with a large number of machines operating on large data**

→ **No redundancy of network connections between storage and the virtualization system**

→ **Storage is not scalable enough for the constantly increasing number of virtual machines**

As you can see in the list above, the issues that might show up involve hardware mostly. Therefore, it is critical to use proper and high-quality hardware. Fortunately, Open-E specialists have provided **a comprehensive list of hardware tips to avoid those issues and how to make your storage for virtualization solution with Open-E JovianDSS as optimal as possible, in an uncomplicated and affordable way.**

Check out our case study!

IT-Beratung HALBE, which operates its own data center, wanted to realign its strategy by replacing the conventional storage and virtualization environment based on Open-E DSS V7 and VMware ESXi with a new infrastructure that utilizes Open-E JovianDSS with **Microsoft Hyper-V**. Taking into account a general cost minimization, the goal was to create a future-proof starting position so that competitive services in the IT and hosting area can still be offered to the customers.

IT-Beratung HALBE
GmbH & Co. KG

*The main reason we have chosen the redundant fail-proof storage solution based on Open-E JovianDSS presented by Boston Server & Storage Solutions was the perfect harmonization of stability, performance, scalability, and flexibility (which is more and more important these days). It allows us to react perfectly to the market needs. **Another noteworthy aspect is the amount of electricity saved, about 4 kWh per day**, which, thanks to the modern hardware, also benefits the environment and has a positive impact on our electricity costs. Especially the transparent advice in the area of hardware design possibilities on the part of Boston Germany, along with a fair price, convinced me - à la bonne heure. With this solution, we have created the optimal set of their applications in the home office for our customers.*

Thomas Halbe,
Managing Director / IT-Beratung HALBE

Hardware Recommendations

So, let's talk about the hardware that is recommended to be used to make such a solution optimal. As for the data groups, it is recommended to use **HDD SAS disks, preferably 10k RPM**. For more demanding environments, we'd suggest using All-Flash storage based on **dual-port SSD for shared storage clusters** or All-Flash storage based on high-capacity, **multi-layer 3D NAND SSDs for non-shared storage clusters**.

For read cache, a fast, read-intensive SSD is recommended, as the capacity depends on the hot data footprint (strictly speaking – the number of virtual machines). When it comes to All-Flash storage, a **read cache** is not required.

Talking about recommendations for **writelog**, the following recommendations have been collected by our specialists:

→ In the case of data groups on HDD, fast, low latency, write-intensive SSD is recommended

→ Due to extremely low latency and high endurance, a device based on, for example, KIOXIA FL6 Enterprise SCM NVMe is preferred

→ For All-flash, it is usually not necessary to use writelog. Using the writelog may be beneficial when the SSD storage is relatively slow (e.g., a small number of QLC NAND disks) and a writelog device is very fast, e.g., Intel Optane (Note: such solutions always have to be tested before implementation)

→ Random performance may improve when using writelog (SLOG) with All-Flash disks, but sequential performance may be poor. In such a situation, if it's possible to select zvols for which the priority is a sequential performance, set ZFS logbias to throughput for them. Thanks to this, write operations on these zvols will bypass the SLOG

CPU, RAM and Network Requirements

For optimization from the **CPU's** side and extremely intensive load installations, we recommend a fast processor around 3.0 GHz (the preferred line is Intel Xeon Gold or an equivalent from AMD). For standard load installations, the Intel Xeon Silver CPU with a 2.4 GHz clock is enough. Keep in mind that the number of cores depends on the number of storage controllers, network adapters, and other devices, such as NVMe disks that will be included in the storage server.

For RAM, you should use a large (at least 64GB) and fast (adapted to the controller in the CPU) RAM for even better IOPS. When it comes to the **storage controller**, there are no special requirements.

For **network controllers**, we recommend high-speed network adapters with RDMA support for the mirror path with the number of ports that allow using the MPIO in the connection to the client.

In the case of network **switches**, they should definitely be of high quality and high speed with Rapid Spanning Tree Protocol (RSTP) support to prevent any bottlenecks in network connectivity.

Check out our case study!

Cloudlayer8 (CL8) is a state-of-the-art Tier-III data center, and cloud services provider from Cyprus. The company needed a new software solution for its configurations of two off-site backup server setups, one of which was already using a Veeam Cloud Connect solution and the other, using a VMware VDC solution.

Offering money-back guarantee SLAs for a data center is not easy, and reliable enterprise software is essential to have peace of mind! We've been using the Open-E JovianDSS system for more than a year. The product experience is very positive, as it is stable, easy to use, robust, and offers excellent performance. The High Availability Cluster has an outstanding price-performance ratio.

**Theodosis Theodosiou,
Business Development Manager at Cloudlayer8
Cyprus**

Open-E JovianDSS Configuration Tips

Take a look at the 8 points below and keep them in mind for the future configuration of the Open-E software used for virtualization purposes:

1 A 2-way mirror or a 4-way mirror (especially in the case of a non-shared storage cluster) is a must for optimal redundancy and performance.

2 Set up Thin Provisioning in zvol configurations for optimal use of storage capacity.

3 For better performance and connection redundancy set the MPIO on iSCSI connection to the client system.

4 Zvol volblocksize should be matched to the application/client system requirements.

5 For higher IOPS, use a smaller volblocksize and, for higher throughput, a bigger volblocksize.

6 When configuring the architecture and storage parameters, don't forget to use the best practices document dedicated to storage, prepared by the manufacturer of the virtualization platform you are going to use.

7 Use tunings for SAN protocols available in the Open-E JovianDSS Release Notes.

8 Use several volumes instead of one and attach up to 4 volumes per target because of a separate command queue for each iSCSI target – this recommendation applies only to iSCSI TCP connections and does not apply to RDMA connections.

High Availability Precautions

When building High Availability cluster solutions, it can be a good practice to use one of our "**no single point of failure**" topology schemes.

In the case of **the Open-E Non-shared Storage High Availability Clusters**, fast NICs on the mirror path (25+ GbE recommended) can be helpful to achieve a good throughput on the HA cluster replication. NICs with RDMA support are recommended for even better performance in large data operations. The general rule is that network bandwidth should be balanced with storage performance.

Talking about **High Availability** even further, use static discovery in all SAN initiators and extend timeouts in all SAN. Also, make sure that the resource switch time is within an acceptable range, especially in the case of non-shared storage HA clusters and a large number of disks. If the switchover time is too long due to a large number of disks, it can be fixed by employing the RAID controller.

After you finish the configuration process, pre-production tests should be conducted - performance and basic failover operations/triggers should be checked (system restart, power off, a manual move of resources). Don't forget that the second ring is recommended in the HA cluster, and up to six ping nodes are recommended.

Tailored Virtualization With a Hypervisor-Agnostic Solution

Create a robust foundation for your data storage virtualization with **Open-E JovianDSS** - a highly compatible data storage software! Get the most out of your system, by benefiting from using a hypervisor agnostic software that supports such hypervisors as:

→ VMware
→ Microsoft Hyper-V
→ ProxMox
→ Xen

→ XenServer
→ Citrix
→ XCP-ng

... and more!

Learn more on our website:

Cost-Effective Data Storage for Virtualized Infrastructure

Open-E JovianDSS comes with inexpensive product licenses and technical support options, compared to other storage software providers:

→ The licensing system is based on the capacity of each storage environment and is designed to be as fair as possible for users.

→ Lowers Total Cost of Ownership (TCO) through built-in storage virtualization with thin / over provisioning and compression.

→ Free, built-in backup feature, no third-party software necessary.

Conclusions

All in all, virtualization is a technology that provides not only high performance, great efficiency, and flexibility but also a range of other benefits. Investing in hypervisor-agnostic data storage for virtualization and, at the same time, following a few implementation rules results in building a future-proof, reliable, and high-performing storage solution that will last for years.

Check the Latest Open-E Brochures
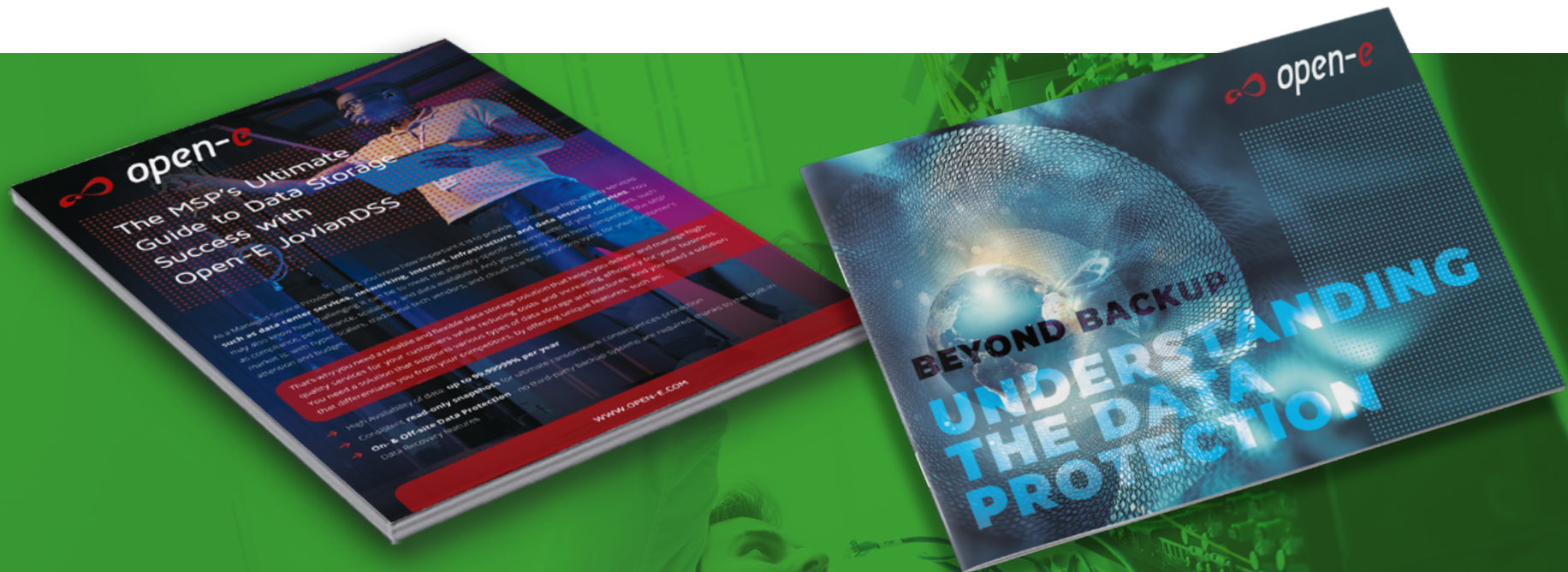
Provide Your Clients Reliable Services and Manage Your Data Storage Like a Pro!

Time is money, and so is the Data

A big step for data storage, and even bigger for your budget efficiency!

open-e

Founded in 1998, Open-E is a well-established developer of IP-based storage management software. Its flagship product, Open-E JovianDSS, is a robust, award-winning storage application that offers excellent compatibility with industry standards. It's also the easiest to use and manage. Additionally, it is one of the most stable solutions on the market and an 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 40,000 installations worldwide. Open-E has also received numerous industry awards and recognition for its product, Open-E DSS V7.

+40000 software implementations

+100 countries worldwide

+25 years of experience

+800 certified engineers and sales professionals