OPEN-E JOVIANDSS

ACCELERATES YOUR HYPER-CONVERGED INFRASTRUCTURE

Table of contents

Hyper-Converged Infrastructure Advantages
for 2025

In 2025, the world of data storage is facing unprecedented challenges as businesses continue to generate and store vast amounts of data but need to count every penny at the same time. In this guide, we will explore the key data storage challenges organizations are facing in 2025 and beyond, including virtualization and hyper-convergence. **Whether you're an IT professional looking to optimize your organization's data storage infrastructure or a business leader seeking to gain a competitive edge through better data management, this guide will provide valuable insights into the future of data storage.**

The virtualization system and data storage for virtualization should guarantee high availability, data safety, and good performance, as well as resource-saving capabilities. As data storage is the foundation of virtualization solutions, hardware and software used for such implementations must meet the highest standards.

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
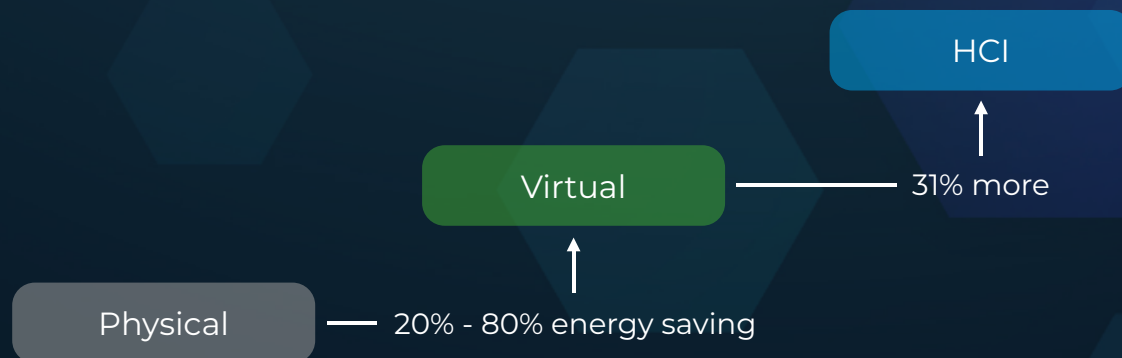
According to SmartX researchers and calculations

Check out our case study!

Stange Elektronik, a key player in industrial control systems, understood the importance of a robust data storage foundation. Their existing Open-E DSS V7 had provided exceptional stability, a quality they sought to maintain while embracing modernization. Committed to a reliable partnership, Stange Elektronik once again turned to Open-E for their next-generation storage solution. Tasked with managing over 60 virtual machines requiring always-on data access, they needed a system engineered for high availability, enhanced speed, and smooth integration. Explore how Stange Elektronik's upgrade to Open-E JovianDSS not only facilitated a seamless migration from their legacy Open-E DSS V7 but also positioned them for significant future growth.

STANGE

The collaboration with Open-E and ICO was outstanding. Transparent communication and exceptional technical expertise impressed us across the board. The seamless integration of the High-Availability cluster solution not only met our requirements but also sustainably optimized our IT infrastructure. Flexibility and customized consultation are rare qualities nowadays, but they were perfectly delivered here.

**Martin Küchler, IT Manager,
Stange Elektronik**

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

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

Management
Storage
Virtualization
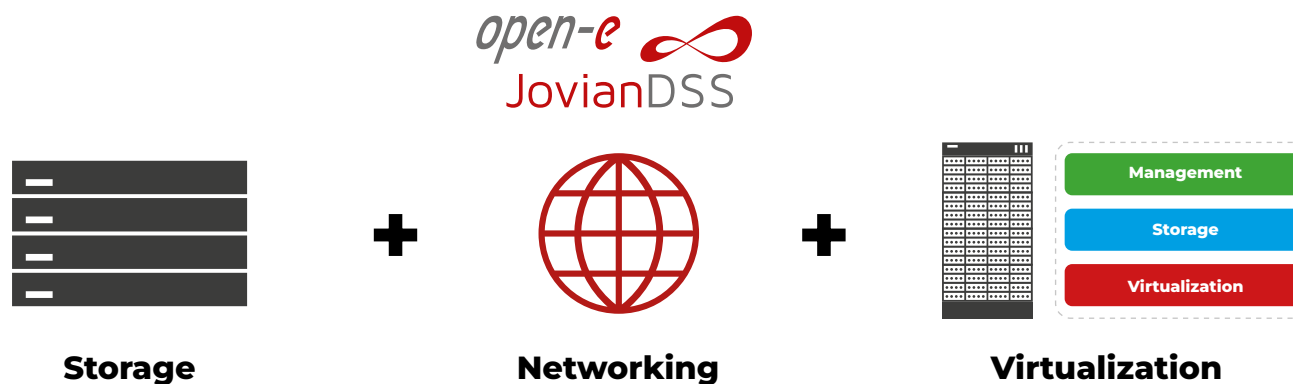
Open-E JovianDSS Implementation Examples

Virtualization technology has revolutionized the way IT infrastructure is designed, deployed, and managed. One of the most critical components of any virtualized environment is data storage, of course. In fact, **80% of Open-E implementations involve virtualization**, whether it's data storage for virtualization or virtualized storage, and it supports **Proxmox VE, VMware, Citrix and Microsoft Hyper-V**.

✕PROXMOX   **vm**ware®   citrix.   ⊞ Microsoft Hyper-V

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 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

FAILOVER
Storage backend physical storage
appliances working as HA Cluster

HYPERVISOR

open-e
JovianDSS

VIRTUAL APPLICATION SERVERS:
Web server, Database server, VDI, Email servers etc.
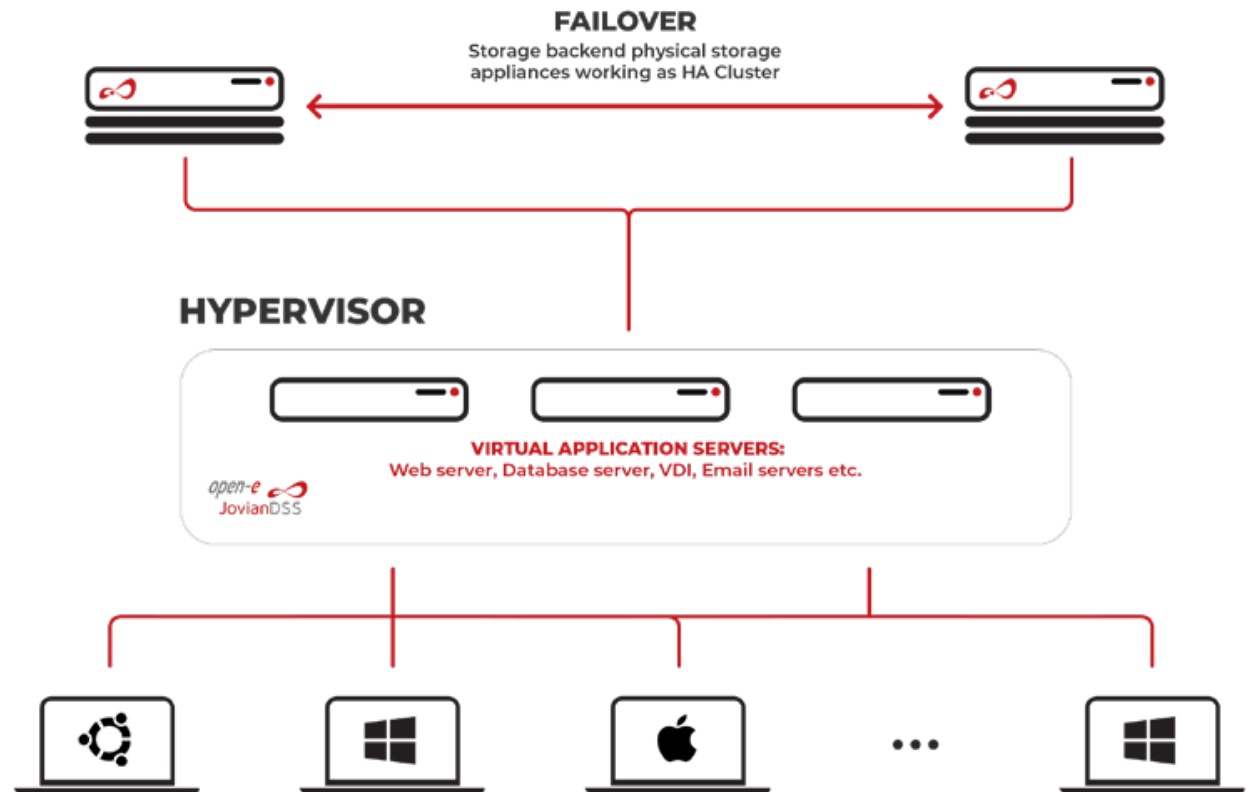
Virtualized Data Storage Back-end **within Hypervisor**

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

HYPERVISOR

VIRTUAL APPLICATION SERVERS:
Web server, Database server, VDI, Email servers etc.

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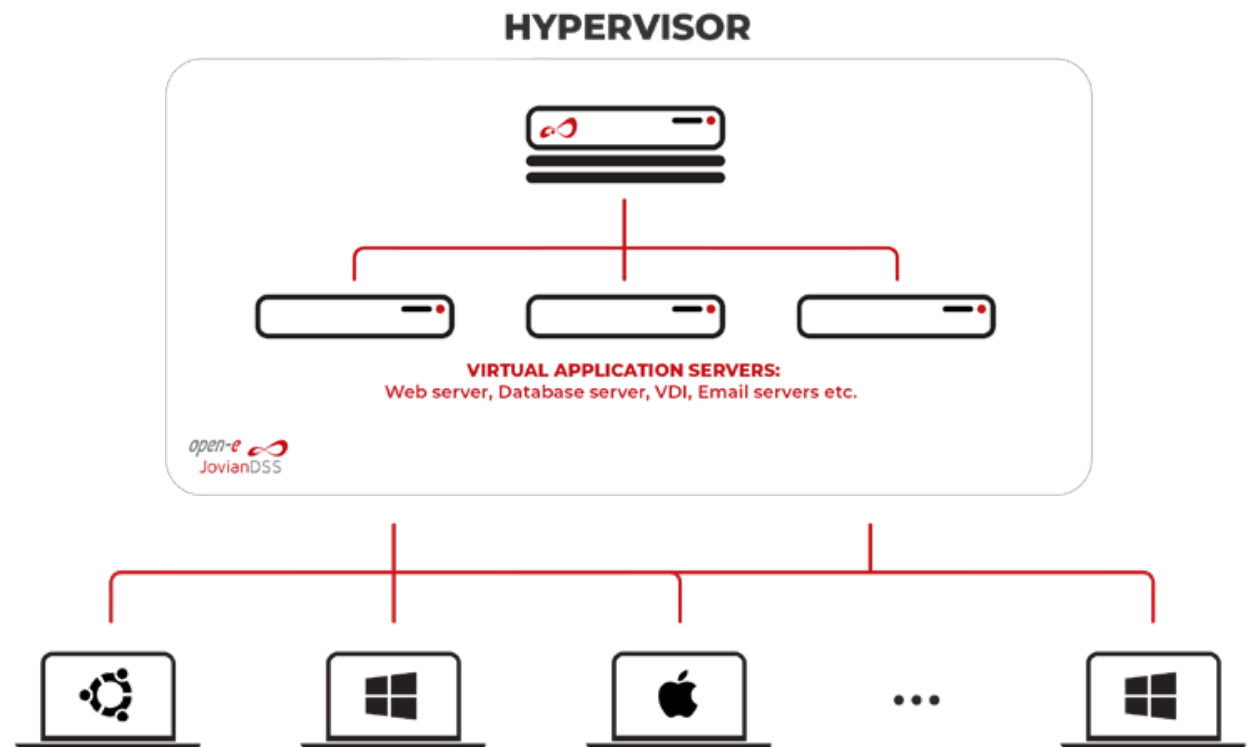
Virtualized Data Storage Back-end within a HA Cluster Nodes Run **on Hypervisors**

Advantages:

+ Eliminates a single point of failure due to failovers between both the storage servers and the hypervisors.
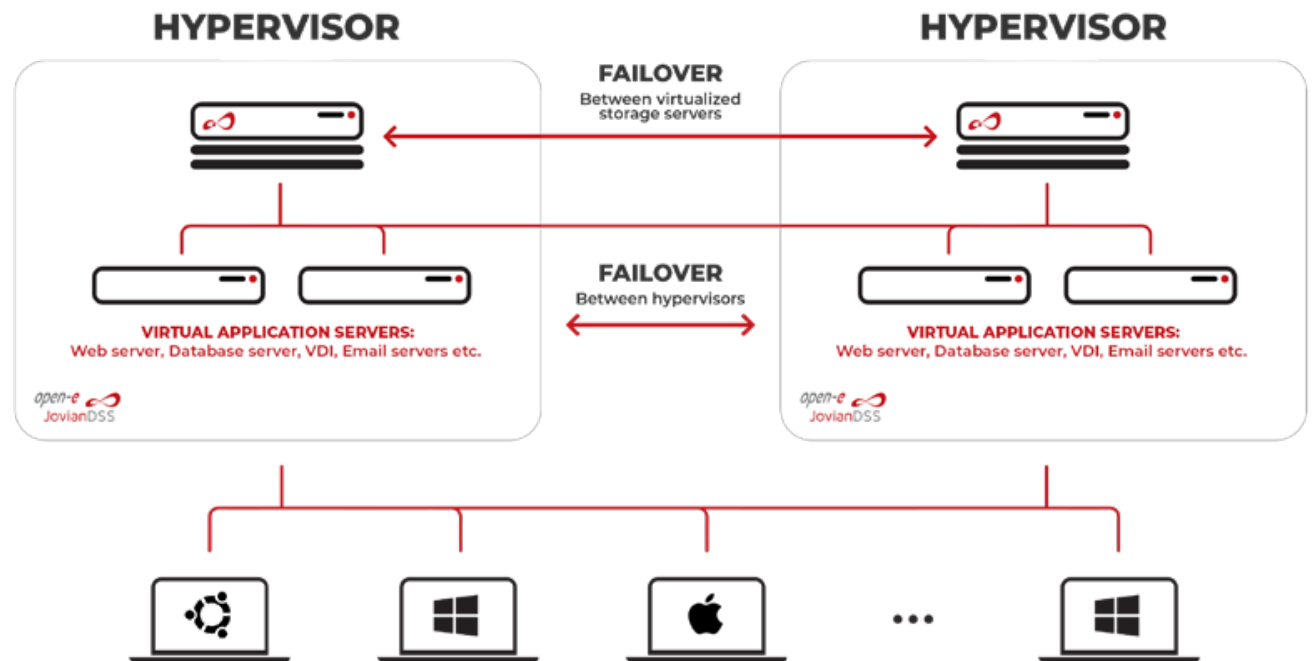
+ Ensures uninterrupted operations in typical failure scenarios

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

open-e JovianDSS

STORAGE SYSTEMS

NETWORK

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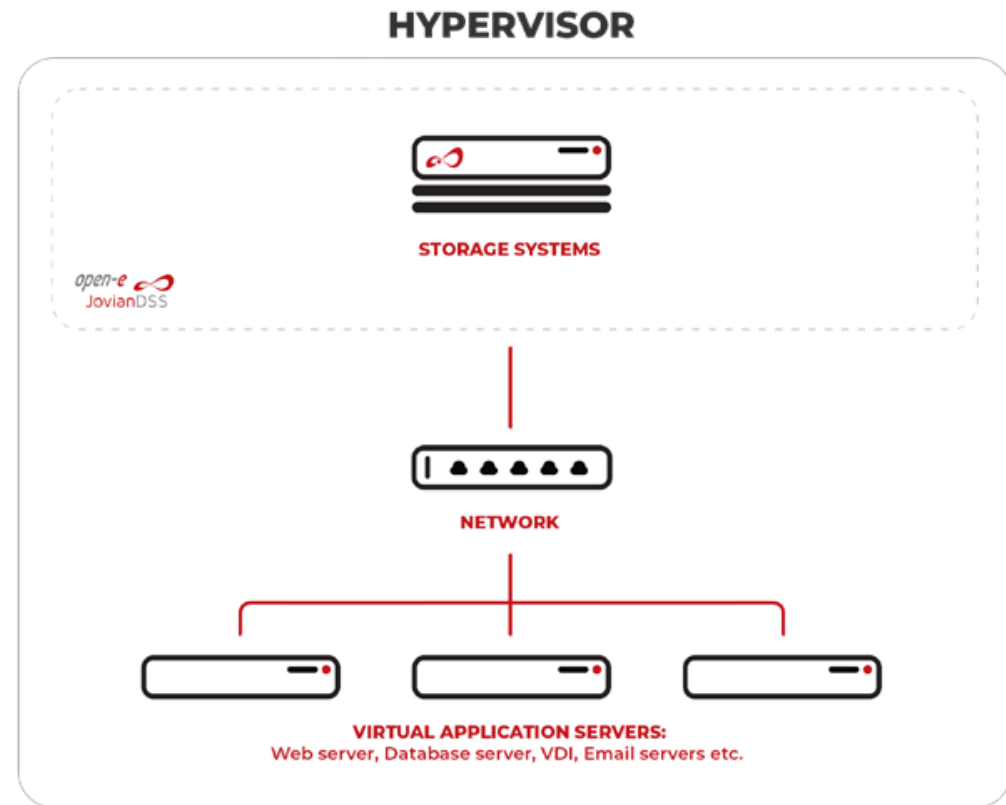
How to Optimize Your Open-E JovianDSS for Virtualization Purposes

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.**

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!

Managing data centralization across numerous global locations can be a significant challenge. However, through effective collaboration, innovative strategies, and the robust features of Open-E JovianDSS, **Optima Packagning** managed to implement a solution perfectly suited to address key requirements including virtualization of data storage!

OPTIMA

Based on our experience, Open-E was, of course, the obvious choice. We then looked at the Open-E JovianDSS solution, which simply won us over with its feature set. These are the familiar features of the ZFS Data System with snapshot technology and Open-E On- & Off-Site Data Protection. These were simply good solutions that made the product interesting for us.

**Manuel Kuss,
Senior System Administrator at Optima Packaging**

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.

Benefit from Proxmox VE-based Virtualization With Open-E JovianDSS

The Open-E JovianDSS and Proxmox VE integration provides a flexible, scalable, and robust enterprise-level data storage and virtualization solution. Open-E JovianDSS serves as the data storage back-end for the Proxmox VE hypervisor, offering essential features like snapshots, automated backups, and various restoration options to ensure data protection and high availability.

By using this integration you can set up an IT system that is cost-effective, efficient, and reliable while delivering high performance to meet the demands of modern IT environments.

Reliable and Future-Proof Data Storage

Enjoy a stable data storage solution with robust protection features, ensuring full compatibility with future-proof and hypervisor-agnostic technology.

Enhanced Efficiency

Streamline your IT operations with integrated management, high-performance capabilities, and hardware-agnosticism, all while reducing energy costs through virtualization.
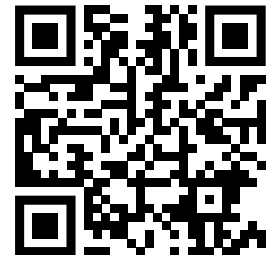
Reduced Costs

Lower your total cost of ownership (TCO) by optimizing resource use and benefiting from competitive licensing, making your investment more cost-effective.

Seamless Integration, Optimized Virtualization.
Choose Open-E JovianDSS with Proxmox VE.

Learn More About This Integration

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 proven 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.

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 is 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.

+40,000 software implementations

+120 countries worldwide

+25 years of experience

+800 certified engineers and sales professionals