HOW TO STORE AND MANAGE

CCTV AND SURVEILLANCE VIDEO DATA WITH OPEN-E JOVIANDSS

Table of contents

Executive Summary

How to choose between on-site, cloud, and hybrid data storage for CCTV and surveillance data, and what are the pros and cons of each option.

How to use Open-E JovianDSS to create a hybrid data storage solution that combines the benefits of on-site and cloud storage for CCTV and surveillance data.

How to leverage Open-E JovianDSS features and capabilities to optimize the performance, availability, protection, and scalability of CCTV and surveillance data storage.

CCTV and surveillance systems are becoming more advanced and data-intensive, requiring reliable and scalable data storage solutions that can handle high-resolution video streams, metadata, and analytics. Traditional CCTV recorders such as DVRs and NVRs have limitations in terms of capacity, performance, and protection, which can compromise the security and intelligence of CCTV and surveillance systems. Additional data storage systems for cameras offer an alternative that can overcome these challenges by providing flexible, scalable, and secure storage for CCTV and surveillance data.

Open-E JovianDSS is a software-defined storage platform that can run on any standard x86 server hardware and support any type of CCTV and surveillance cameras. **It offers high performance, high protection for CCTV and surveillance data, with features such as self-healing, compression, deduplication, built-in backup, and encryption.**

In this brochure, we will explain the details of data storage requirements for CCTV and surveillance systems, the challenges to take into consideration, as well as best practices prepared by Open-E's experts.

See how Open-E JovianDSS can help you overcome the data storage challenges of CCTV and surveillance systems, and provide you with a reliable, scalable, and secure data storage solution that can support your current and future needs.

Data Storage Infrastructure Challenges for CCTV and Surveillance Systems

CCTV and surveillance systems are essential tools for ensuring the safety and security of people, property, and assets. They are also becoming more intelligent and sophisticated, thanks to the rapid advances in camera technology, and the emergence of AI and analytics applications that can provide real-time intelligence from video streams.

However, these advancements also pose significant challenges for the data storage infrastructure that supports CCTV and surveillance systems. The higher resolution of cameras (such as 4K or even 8K), the wider field of view, the longer retention periods, and the increased use of analytics all generate massive amounts of data that need to be stored securely and reliably.

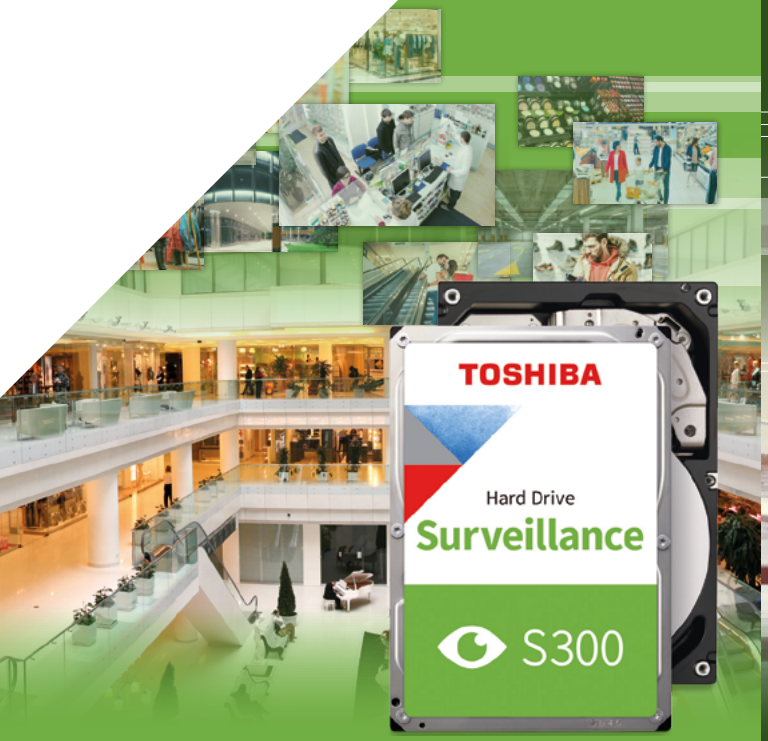
Traditional data storage devices such as DVRs (digital video recorders) or NVRs (network video recorders) are not designed to handle such large volumes of data, due to:

- **capacity limitations** that require adding more units or replacing existing ones to accommodate more cameras or longer retention periods,
- **performance limitations** that can affect the quality and availability of video streams,
- **protection limitations** that can expose CCTV and surveillance data to risks of corruption or loss due to hardware failures or malicious attacks.

SMALL & MEDIUM BUSINESS

S300

24/7 operation.
Up to 180 TB/year.
Up to 64 cameras.



- 3.5" SATA Hard Drive
- 6 | 4 | 2 | 1 TB
- 5,400 rpm (6 | 4 | 2 TB) | 5,700 rpm (1 TB)
- 256 MB buffer (6 | 4 TB) | 128 MB buffer (4 | 2 TB) | 64 MB buffer (1 TB)

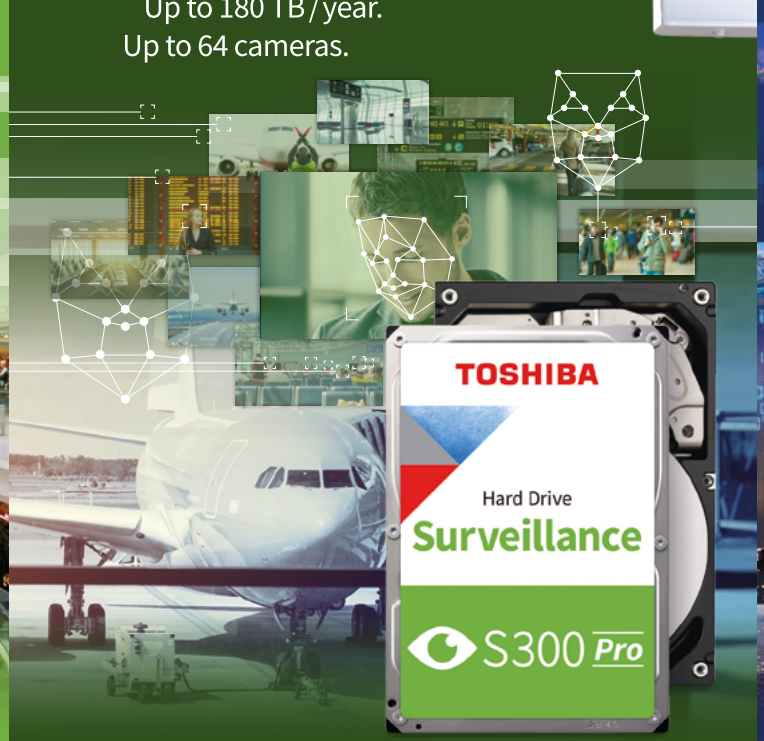
Use for:

- Surveillance Digital Video Recorders (sDVR)
- Surveillance Network Video Recorders (sNVR)
- Hybrid sDVR (analog and IP)

PROFESSIONAL & PUBLIC

S300 Pro

Multi Drive Systems.
RAID Storage Arrays.
24/7 operation.
Up to 180 TB/year.
Up to 64 cameras.



- 3.5" SATA Hard Drive
- 10 | 8 | 6 TB
- 7,200 rpm
- 256 MB buffer

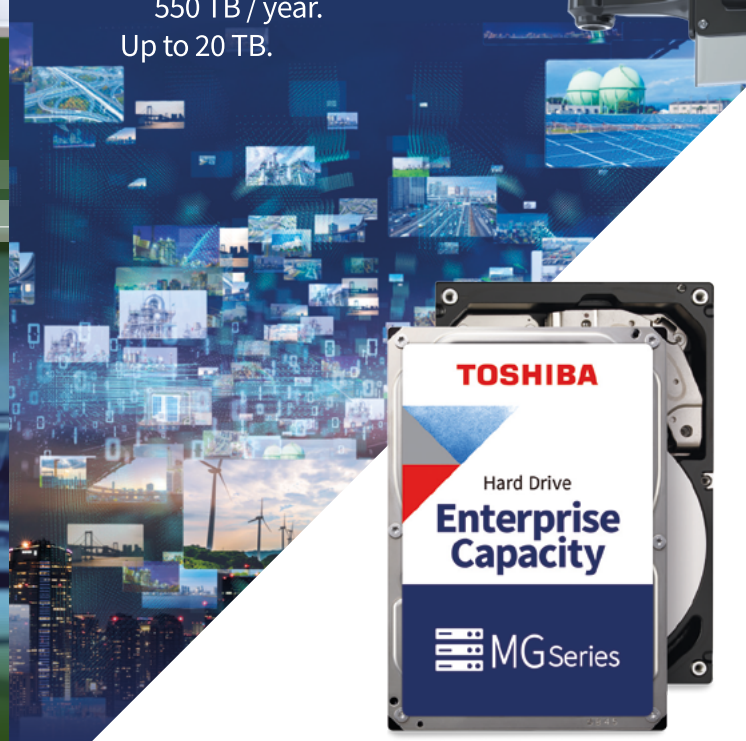
Use for:

- Surveillance Digital Video Recorders (sDVR)
- Surveillance Network Video Recorders (sNVR)
- Hybrid sDVR (analog and IP)
- RAID Storage Arrays for Surveillance

BIG DATA & ANALYTICS

MG Series

Large Scale Arrays.
Professional Analytics.
24/7 operation.
550 TB / year.
Up to 20 TB.



- 3.5" SATA or SAS Hard Drive
- 20 | 18 | 16 | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 1 TB
- 7,200 rpm
- Up to 2.5 million hours MTTF

Use for:

- Centralized Surveillance Data Storage Systems
- Archive and Data Recovery Systems
- Industrial Server- and Storage Systems
- Enterprise Storage Arrays

View more

toshiba-storage.com

On-Site Data Storage for CCTV

To overcome the recorders' limitations, the possible option is to use an on-site data storage solution for your CCTV system.

Systems like these offer some advantages, such as:

- **Lower long-run cost:** On-site data storage may have lower long-run and operational costs than cloud storage, depending on the size and configuration of your CCTV system.
- **More control:** On-site data storage gives you more control over your CCTV data, as you can decide where and how to store it, who can access it, and how to secure it. You can also customize your storage solution to suit your specific needs and preferences.
- **Less dependency:** On-site data storage does not depend on external factors such as Internet availability, network performance, or cloud provider reliability. You can access and manage your CCTV data without any interruptions or delays.

However, on-site data storage also has some drawbacks, such as:

- **Higher upfront costs:** On-site data storage requires higher investments to create the infrastructure at the very beginning.
- **Less flexible scalability:** On-site data storage is difficult to scale up or down as your CCTV system changes or expands. You may need to replace or upgrade your hardware, software, or network components, which can be disruptive and time-consuming.
- **Higher data loss risk:** On-site data storage can be affected by more threats, such as natural disasters, theft, and fire, but it can be overcome by the additional data storage features, that enable the data georedundancy. Open-E JovianDSS covers it thanks to the powerful On- & Off-Site Data Protection feature.

EQUUS
COMPUTE SOLUTIONS

The Texas Police Departments needed a reliable, scalable, and secure data storage solution for their video surveillance data. They chose the Equus / Open-E / WatchGuard solution, a software-defined storage solution that integrates with Microsoft ADS and supports SMB/CIFs. The solution provides high quality, flexibility, and cost benefits, and allows for easy expansion and upgrade of storage space. The solution also met the initial demand of over half a PB and the potential growth of more than 1PB without interruption.

Cloud Data Storage for CCTV

Cloud data storage for cameras is an alternative that can address some challenges by providing flexible and scalable storage capacity that can be accessed from anywhere via the Internet. Cloud data storage also offers advantages such as lower upfront costs, easier management, and better protection against disasters.

Cloud storage offers several benefits, such as:

- **Unlimited capacity:** You can store as much CCTV data as you need without worrying about running out of space or buying additional hardware. You only pay for what you use and you can adjust your storage plan as needed.
- **High reliability:** Cloud storage providers offer multiple levels of redundancy and encryption to protect your CCTV data from failures, disasters and unauthorized access. You can also use cloud backup and recovery services to restore your data in case of any issues.
- **Easy scalability:** Cloud storage allows you to add or remove cameras, change resolution and retention period, or upgrade your video management system without affecting your storage performance or availability. You can also leverage cloud analytics and artificial intelligence services to enhance your CCTV system.
- **Fast accessibility:** Cloud storage enables you to access and view your CCTV data from anywhere, anytime, using any device with an Internet connection. You can also stream or download your data with low latency and high speed.

However, cloud storage also has some limitations, such as:

- **Large file sizes:** High-resolution CCTV cameras generate large amounts of data that can consume a lot of bandwidth and take a long time to upload or download. You may need to optimize your network infrastructure or use compression techniques to reduce the data size.
- **Privacy and compliance:** Storing your CCTV data in the cloud may raise some privacy and compliance concerns, depending on the type and location of your data and the regulations that apply to your industry or region. You may need to check the policies and certifications of your cloud provider and ensure that they meet your requirements.
- **Cost and complexity:** Cloud storage may incur higher costs than on-site storage over time, depending on your usage patterns and pricing models. You may also need to manage multiple cloud accounts, services, and vendors, which can increase the complexity of your CCTV system.

BOOST

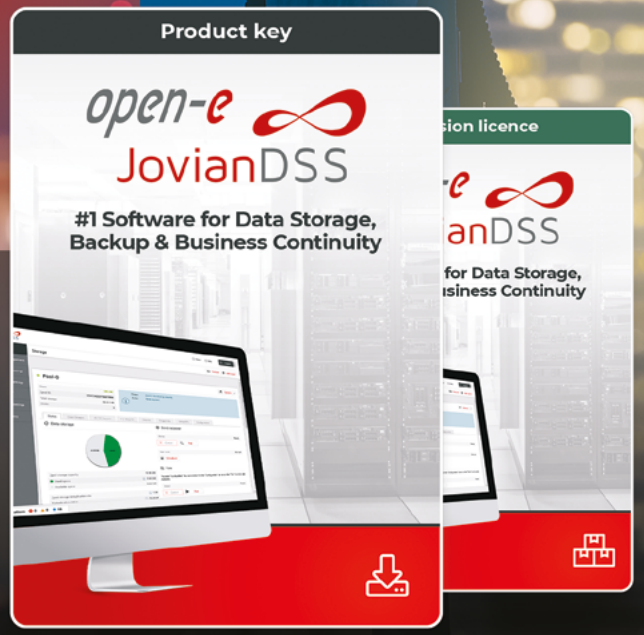
YOUR SURVEILLANCE SYSTEM

with a proper data storage solution!

Enjoy the unlimited possibilities in data storage solution implementations with **Open-E JovianDSS:** a ZFS- & Linux-based hardware-agnostic **Data Storage Software** that can be used in a wide range of advanced solutions for:

- **Business Continuity & Disaster Recovery**
- **Data Storage**
- **Backup**

Learn more information on our website:
www.open-e.com/r/qvfn



Hybrid Data Storage for CCTV

If you want to enjoy the benefits of cloud data storage without compromising the security of your CCTV and surveillance data, you might want to consider building a private cloud infrastructure with Open-E JovianDSS. **A private cloud is a cloud computing environment dedicated to a single organization and hosted on its own premises or on a trusted third-party provider**. A private cloud can offer advantages such as greater control, customization, and compliance over your data and applications.

Open-E JovianDSS can be used not only as data storage software for on-site systems but also as an operating system for cloud storage applications. This means that you can use Open-E JovianDSS to create and manage your own private cloud infrastructure that can store, protect, and access your CCTV and surveillance data.

With Open-E JovianDSS, you can build a private cloud infrastructure that can provide you with some cloud storage benefits, such as:

- **Scalability:** You can easily expand your storage capacity by adding more servers or disks to your private cloud infrastructure. Open-E JovianDSS supports unlimited scalability with storage expansion during production, unlimited file and volume size, and unlimited snapshots and clones.
- **Flexibility:** You can access your CCTV and surveillance data from anywhere and from any device via the Internet. Open-E JovianDSS supports iSCSI, Fibre Channel (FC), NFS, SMB (CIFS) protocols for data access. You can also use virtual IPs for load balancing and failover.
- **Cost-effectiveness:** You can reduce the costs of owning and operating your data storage infrastructure by using Open-E JovianDSS as a software-defined storage platform. You can use any standard x86 server hardware and any type of CCTV and surveillance cameras. You can also use compression, deduplication, thin and over-provisioning to optimize your data storage efficiency.

Therefore, choosing a data storage solution for CCTV and surveillance systems is not a simple matter of opting for on-site or cloud storage. It requires a careful evaluation of the specific needs and requirements of each CCTV and surveillance system:

- **the trade-offs between different types of data storage devices,**
- **the integration possibilities between on-site and cloud storage,**
- **and the best practices for optimizing performance,**
- **efficiency,**
- **and security.**

Data Storage Requirements for CCTV

To build an on-site data storage server for CCTV purposes, you need to consider both the hardware and software requirements that can support your CCTV system. Here are some general guidelines.

The crucial data storage infrastructure requirements for CCTV implementation are:

- **Capacity:** it should be able to handle the high volumes of data generated by CCTV cameras, especially high-resolution ones. It should also be scalable and flexible to accommodate future expansion or changes in retention policies.
- **Speed:** it should be able to deliver fast and reliable access and retrieval of CCTV data, whether it is stored on-site, off-site, or in the cloud. It should also support video analytics and other advanced applications that require high performance.
- **Durability:** it should be able to withstand harsh environmental conditions, such as heat, dust, vibration, and power fluctuations.
- **Data Availability:** it should offer high availability and redundancy to prevent data loss or corruption.
- **Security:** it should be able to protect the CCTV data from unauthorized access, tampering, or theft.
- **Compliance:** it should also comply with relevant regulations and standards for data privacy and security.

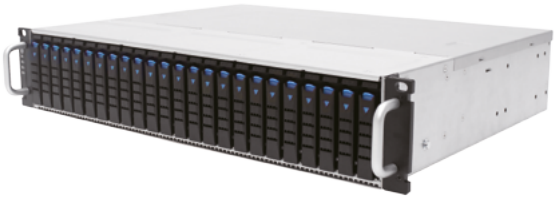
ARXYS

Status Automation, a provider of electrical, security and IMIT services, needed a data storage solution that could handle high volumes of video surveillance data and was cost-effective, scalable, and flexible. They chose Open-E JovianDSS, a softwa-re-defined storage solution offered by Arxys, an Open-E Gold Partner. The solution increased the security level, performance, and reliability of their surveillance systems while reducing the support costs and the Total Cost of Ownership

We get performance, reliability, sca-lability, and top-of-class service and support plus a bid winning price point.

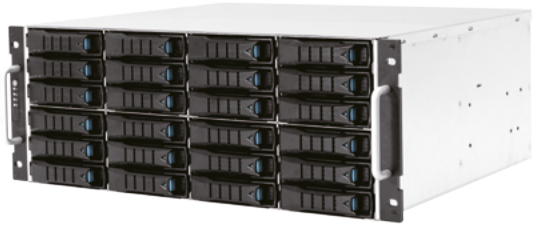
Cliff Pascas,
Status Automation

> J2024-06-35X



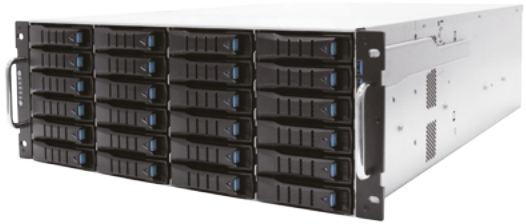
- Ruggedized design (Internal board to board connection)
- Tool-less design
- Hot-swap expander modules, drives, PSU, fans
- Short-depth
- Clear front panel LED indicators
- Optimized thermal solution
- BMC onboard

> J4024-04-35X



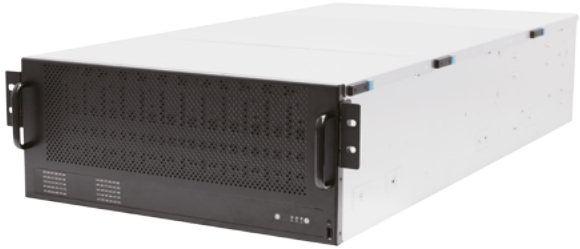
- Board to board connections no signal cable and no PSU cable
- Tool-less design
- Hot-swap expander module, drives, PSU and fans
- Short-depth
- Clear indicators
- Optimized thermal solution
- BMC onboard

> SB401-TU



- 4U 24-bay storage server with SATA/SAS3/NVMe drives support
- Supports 3rd Gen. Intel® Xeon® Scalable processors (Ice Lake)
- Intel® C621A Chipset to provide 5+ years product life cycle
- Onboard Baseboard Management Controller for system management and IPMI control
- Dedicated BMC management port
- Front-to-back airflow and hot-swap redundant fans to provide optimal thermal conditions

> SB407-TU



- 4U high-density storage server supports 60 hot-swap 3.5” SAS drive bays
- Supports 3rd generation Intel® Xeon® Scalable Processor (Ice Lake)
- Intel® C621A chipset to provide 5+ years product life cycle
- Onboard Baseboard Management Controller for system management and IPMI control
- Dedicated BMC management port
- Front-to-back airflow and hot-swap redundant fans to provide optimal thermal conditions

AIC Netherlands Office
www.aicipc.com | sales@aicipc.nl

CCTV Hardware Requirements

You need to choose a suitable storage device that can handle the data volume, throughput, and retention of your CCTV system. You can use a digital video recorder (DVR) for analog cameras or a network video recorder (NVR) for IP cameras. You can also use a storage area network (SAN) or network-attached storage (NAS) device for more scalability and flexibility. You must ensure that your data storage device has enough disk space, memory, CPU, and network ports to meet your CCTV system's needs.

You can use a surveillance storage calculator to estimate the required disk space based on the number of cameras, resolution, frame rate, video quality, compression type, and retention period. You also need to consider your storage device's power supply, cooling system, security system, and backup system.

CCTV Storage Calculator

Once you decided on the required disk space, you can go one step further and check the entire data storage architecture requirements by using Open-E JovianDSS Storage and RAID Calculator.

Storage License & RAID Calculator

CCTV Software Requirements

How to optimize your data storage with Open-E JovianDSS

If you are looking for a reliable and efficient data storage solution for your CCTV and surveillance systems, you might want **to consider Open-E JovianDSS, a software-defined storage platform that can run on any standard hardware and support any type of CCTV and surveillance cameras**. Open-E JovianDSS offers many features and benefits that can help you store, protect, and manage your video data securely and easily.

Here are some tips on how to optimize your data storage with Open-E JovianDSS:

- You don't need to use a cluster configuration for storing video data from cameras. You can distribute the video data streams from different sets of cameras to different Open-E JovianDSS single nodes for load balancing and fault tolerance.
- You can save disk space and bandwidth by having the recorder store the video data on a local disk and send copies to Open-E JovianDSS nodes at a specified interval. This way, you can avoid sending continuous video streams to the nodes and reduce the network load.
- You can improve the performance of Open-E JovianDSS nodes by using HDD disks with zvols set to sync disabled, and this way, no write log device is required. This will reduce the latency and increase the throughput. However, you need to change the zfs_txg_timeout parameter to 1 to prevent data corruption in case of power loss or node failure.
- You can offload the random write workload from Open-E JovianDSS nodes to the recorders, which can store the random data locally and then send sequential data streams to Open-E JovianDSS nodes as target data storage and backup. This will improve the performance and durability of both the recorders and target data storage infrastructure.

These are some of the tips on how to optimize your data storage with Open-E JovianDSS. If you want to learn more about Open-E JovianDSS features and capabilities, please visit our website or contact us for a free consultation.

Check the Latest Open-E Brochures

CCTV Data Storage Best Practices

For maximum CCTV system protection, ensure:

- **Reliability and availability** of the video data by using Open-E JovianDSS features such as self-healing, snapshots, and On- & Off-Site Data Protection.
- **Security and privacy** of the video data by using encryption, access control, and audit logging features on both the recorders and Open-E JovianDSS nodes.
- **Scalability and flexibility** of the video data storage by using Open-E JovianDSS features such as pooled storage model, unlimited scalability, and thin/over-provisioning.
- **Compatibility and interoperability** of the video data storage with Open-E JovianDSS features such as iSCSI, Fibre Channel (FC), NFS, SMB (CIFS) protocols, Linux-based architecture, and support for any standard x86 server hardware and any virtualized storage environment.

Summary

Open-E JovianDSS is the ideal data storage solution for CCTV and surveillance systems that need to store large volumes of data securely and efficiently, while also gaining insights from analytics and AI. It is designed to meet the current and future challenges of CCTV and surveillance systems, as well as the needs of IT administrators and decision-makers who are looking for a cost-effective, easy-to-manage, and future-proof data storage solution.

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 38,000 installations worldwide. Open-E has also received numerous industry awards and recognition for its product, Open-E DSS V7.

+38000 software implementations

+100 countries worldwide

+25 years of experience

+800 certified engineers and sales professionals

Open-E, Inc. | +1 (678) 666 2880 (US) | +49 (89) 800777 0 (Europe) | info@open-e.com