

Technical Validation Report Summary

iXsystems TrueNAS

Storage Performance, Flexibility, and Integration for the Evolving On-premises Data Center

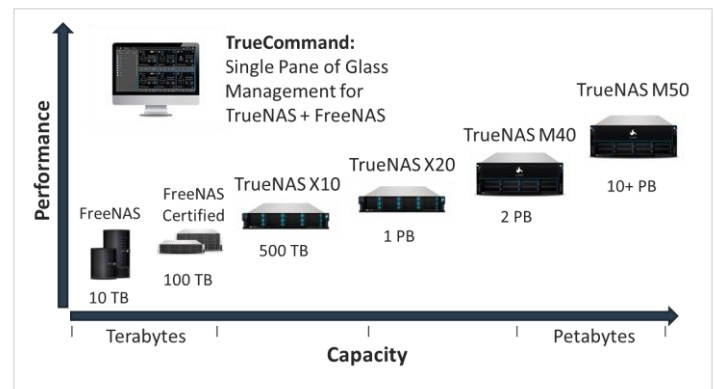
ESG asked IT professionals responsible for data storage technology to name the benefits their organization realized as the result of deploying on-premises flash storage technology. Improved performance (48%), better TCO (47%), and improved resource utilization (46%) were the most-cited responses. While flash leads to notable TCO improvements and cost savings in virtualized environments, for other use cases—video storage, file sharing, and backup and archive, for example—a hybrid configuration might be a better fit. A storage solution should be flexible enough to support all-flash and hybrid configurations to offer the right configuration for each use case.

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The Product

iXsystems has been providing storage and servers driven by open source technology and is the developer of FreeNAS software-defined storage (SDS), an open source operating system that users can install on virtually any hardware platform to share data over a network. With this deep expertise in hardware, software, and storage, iXsystems developed TrueNAS, an open storage platform designed to offer reliability and performance with strong cost efficiency.

TrueNAS storage systems provide unified storage access over NAS (SMB and NFS), SAN (iSCSI and Fibre Channel), and S3-compatible APIs for object storage. TrueNAS leverages the self-correcting OpenZFS file system—when a read returns bad data, OpenZFS repairs it. OpenZFS provides many storage features and functions that are must-haves in any enterprise: thin and thick provisioning with quotas; copy-on-write file system ensures data is never overwritten and snapshots are efficient; intelligent in-line compression; encryption at rest with SED support and no impact to performance; two-tier caching: flash- or NVDIMM-based ZIL (ZFS Intent Log) for writes and DRAM-based ARC (adaptive replacement cache) and flash-based LZARC (layer 2 adaptive replacement cache) for reads; no limits on pool/share capacity or snapshots; integrated ZFS replication and Cloud Sync to AWS, Azure, Backblaze, and others. TrueNAS systems scale from single-digit terabytes to over 10 petabytes in a single system. Systems can be configured as all-flash for maximum performance and low latency and/or hybrid systems for lower cost per TB, with the same software and functionality available for each.



? Why This Matters

The complexity and performance challenges associated with a modern storage environment can lead to overbuying storage in order to achieve acceptable levels of performance. After all, slow storage can result in lost sales, lost customer goodwill, lost productivity, and lost competitiveness, and modern applications demand increasing levels of storage performance.

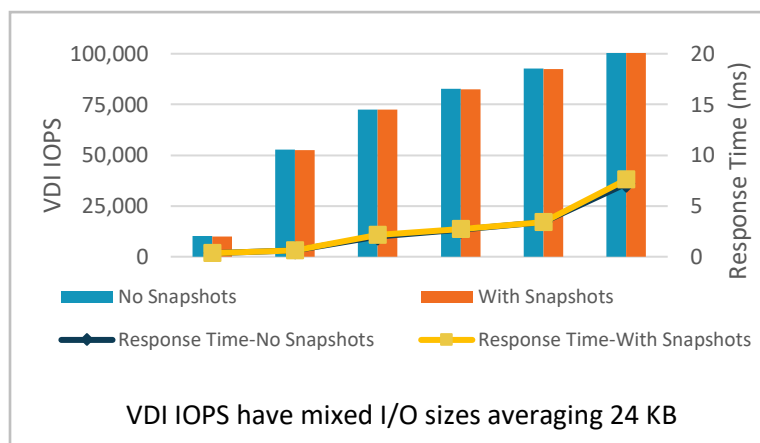
ESG has determined that iXsystems' TrueNAS delivers consistently impressive performance, and that it does so in a cost-efficient package. The solution accomplishes this through a combination of deep hardware, software, and storage expertise that enabled the design of a dual-controller architecture, making it simpler and less expensive than competitive entries that leverage multiple controllers. The OpenZFS file system provides enterprise-class features developed over two decades and is designed to scale.

ESG Technical Review Highlights

ESG Lab performed hands-on evaluation and testing of iXsystems TrueNAS. The following is a summary of the results.

The consistent performance of the iXsystems TrueNAS open storage platform enables organizations to deploy more capacity in a single storage system, which reduces overall costs. ESG has validated that the TrueNAS platform delivers impressive levels of cost-optimized performance. ESG was impressed with the performance, availability, and efficiency of the platform. Testing revealed that TrueNAS provides:

- High IOPS and NFS Ops with consistently low response times.
- High throughput utilizing SSDs and hard drives.
- Minimal to near-zero performance impact of compression and snapshots.
- A diverse and robust feature set, with role-based access and collaborative management, replication and Cloud Sync, unlimited snapshots, system and data health monitoring, and VMware integration.



ESG compared the cost of a TrueNAS solution with quotes from major storage vendors. Systems compared were similar in capacity, performance, and functionality. Factors taken into consideration included hardware, software, support, and maintenance costs. The combination of ZFS, open source, and a lean sales force provides efficiencies that enable iXsystems to offer high performance, feature-rich solutions at high value price points. We calculated a significant delta. Based on our testing and analysis, we found that iXsystems can typically offer up to double the performance at half the cost of their major competitors.

Issues to Consider

The results presented in this document are based on testing in a controlled environment. Due to the many variables in each production data center, it is important to perform planning and testing in your own environment to validate the viability and efficacy of any solution.



The Bigger Truth

Explosive data growth and budget constraints are driving IT managers to rethink the way they have been doing storage. Legacy storage systems that are complex and expensive are displaced in favor of cost-efficient storage systems that are easier to manage. The cost and complexity of legacy storage system refreshes and forklift upgrades are at odds with corporate level mandates of reducing costs and increasing the return on investment.

Business process improvement continues to be a high IT priority. One important area where businesses can improve process is system monitoring and management. ESG validated that the TrueNAS TrueCommand management platform makes monitoring and management of all TrueNAS and FreeNAS devices easy.

If you're considering an upgrade of a legacy primary or secondary storage system and you want to spend less and store more, ESG recommends that you consider the iXsystems TrueNAS storage platform with cloud extensibility, deep management analytics, and up to twice the performance at half the cost of the competition.

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