

TrueNAS M-Series: Unified All-Flash Storage

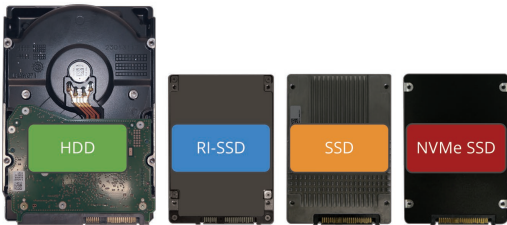
TRUENAS® COMBINES OPEN SOURCE ECONOMICS, HIGH AVAILABILITY ZFS, AND FLASH.

The TrueNAS family, including FreeNAS®, combines the #1 Open Source storage software with the latest flash memory technology to increase storage performance. This performance makes it possible for IT departments to meet increasing demands for more powerful and flexible storage while also reducing costs. Performance applications like databases and metadata servers need more IOPS or lower latency. All-flash dramatically reduces the physical footprint and has a 70% lower total cost of ownership than a hybrid solution. Performance storage no longer needs massive RAM caches or hundreds of small HDDs to increase IOPS.

TRUENAS PROVIDES CHOICE OF MEDIA WITH SAME SOFTWARE

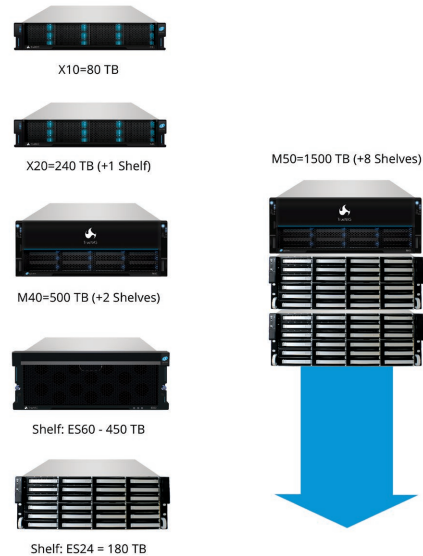
The TrueNAS M-Series provides the evolutionary unified storage platform needed to manage the transition from hard disk drives (HDDs) to solid state flash drives (SSDs). It can be deployed in hybrid mode (HDDs with ZFS cache SSDs) or all-flash mode with ZFS pool SSDs.

All-flash includes two classes of ZFS pool SSDs: performance SSDs and Read Intensive RI-SSDs. Performance SSDs have 12 Gb/s interfaces and use Triple Level Cell (TLC has three bits per flash cell) technology. RI-SSDs cost less, have 6 Gb/s interfaces, and are based on Quad Level Cell (QLC has four bits per flash cell) flash technology. Performance SSDs are typically 3X faster than RI-SSDs and over 12X faster than HDDs. Save on costs by backing up all-flash systems to HDD storage. TrueNAS simplifies this without the need for new software or management systems. TrueNAS enables each of the major storage media in the same system.



ZFS TECHNOLOGY IS FLASH OPTIMIZED

Data integrity is the name of the game, and TrueNAS leaves nothing to chance. With self-healing ZFS, data is protected and rebuilt through multiple drive failures. Any data corruption is automatically detected and repaired. Bit rot is no longer a concern for your critical storage where perfection is the only acceptable result. NVDIMMs are used as ultrafast write caches and ZFS provides the data integrity and protection needed to manage enterprise data. Snapshots, clones, replication, and data scrubbing are standard data management services. OpenZFS provides excellent performance with SSDs using RAID-Z1 and RAID-Z2. OpenZFS uses a "Copy-on-Write" model that turns random writes into flash-friendly sequential writes. These writes are much faster and more efficient than RAID-5 or RAID-6 which require Read-Modify-Write sequences for smaller writes. The result is that RAID-Z delivers significantly better performance and endurance than RAID-5 using the same SSDs.



M-SERIES DELIVERS FLASH SCALABILITY

The TrueNAS M-Series with all-flash is ideal for latency-sensitive and business-critical virtual machines and physical workloads. Latencies of less than a millisecond are typical for most deployments. High Availability is provided through a dual controller configuration. When needed, both an all-flash pool and a hybrid pool can be configured on the same TrueNAS. Multi-shelf scalability of the TrueNAS M-Series enables growth from 8 TB to 1500 TB of all-flash storage.

Systems can support 10GbE, 40GbE, or even multiple 100GbE networking. The TrueNAS M50 system can be configured for over 10 GB/s and 800K IOPS. Self-encrypting drives (SEDs) provide encryption without a performance penalty. TrueNAS can scale to over 1500TB of all-flash storage.

INTELLIGENT STORAGE OPTIMIZATION REDUCES COSTS

Clones provide maximum space savings when you're deploying hundreds of similar virtual machines. SSDs provide more IOPS per TB, improving the performance of space-efficient systems. TrueNAS also includes in-line compression and the option for deduplication at no additional cost.

The adaptive compression algorithm is so efficient that it actually boosts storage performance while maximizing storage capacity. Data is normally compressed before being written. Incompressible data is detected and written directly. The combination of clones, compression, and deduplication let you make the most out of every byte of storage by increasing capacity up to 10x.

UNLIMITED SNAPSHOTS & REPLICATION

Unlike most storage appliances which require additional licenses for advanced features, TrueNAS provides unlimited file version retention and restoration at no additional cost. Snapshots automatically protect data against unintentional modifications with minimal storage overhead. Data can be replicated to a lower-cost, off-site hybrid TrueNAS or FreeNAS system for backup, disaster recovery, and remote synchronization.

With the power of TrueNAS, any data protection or disaster recovery policy is simple to implement and maintain. TrueNAS supports VAAI and also seamlessly integrates with a VMware datastore by coordinating snapshot creation with VMware. When VMware snapshots are deleted, the TrueNAS snapshots can still be retained as stable resurrection points.

TRUENAS SOFTWARE SPECIFICATIONS

FILE-BASED PROTOCOLS

- CIFSv1, SMBv2, SMBv3
- NFSv3, NFSv4
- AFP
- FTP
- WebDAV

BLOCK-BASED PROTOCOLS

- iSCSI
- Fibre Channel

OBJECT PROTOCOLS

- S3-Compatible Host and Client

DIRECTORY SERVICES

- Active Directory (AD)
- Kerberos
- Lightweight Directory Access Protocol (LDAP)
- Apple Open Directory
- Network Information Service (NIS)

NETWORKING

- 10/40/100GbE with Port Trunking/NIC Teaming
- Modes: Balance - rr, Active Backup, Balance xor, Broadcast, IEEE 802.3ad Link Aggregation
- VLAN Support, DHCP client

VIRTUALIZATION

- VMware Ready (ESXi 5.5 and ESXi 6.0), VAAI Block, ESXi Snapshot integration, VM Warn/Stun
- Citrix Ready Verified (Citrix XenServer 6.0)
- Certified for Windows Server 2012 R2 (includes Hyper-V), ODX

FILE SYSTEM

- Adaptive in-line compression
- Snapshots and clones
- Thin provisioning
- Self-healing file system
- Online capacity expansion
- Virtual block devices
- In-line deduplication
- ZFS Stripe, ZFS Mirror, RAID-Z1, RAID-Z2, RAID-Z3

BACKUP

- ZFS Remote Replication
- Cloudsync to AWS, Azure and other cloud providers
- rsync

REMOTE ADMINISTRATION

- HTTP/HTTPS Web Interface
- Email Alert Configuration
- Remote Syslog Client
- Backup and Restore System Settings and State
- Restore to Factory Default
- Resource Monitor
- Log and Event Collection
- Automatic Online Updates
- SNMP server/MIB
- IPMI remote console via iKVM HTML5
- REST API, Websockets API

CLIENT OPERATING SYSTEMS

- Microsoft Windows XP, Vista (32/64-bit), 7 (32/64-bit), 8/8.1, 10, Server 2003/2008 R2/2012 R2/2016
- Macintosh OS X (all versions)
- Linux, UNIX, FreeBSD

TrueNAS M-Series with All-Flash

Unified Storage with Flash Performance, Data Reduction, and ZFS Data Management

TrueNAS combines the performance and features you need with simplified management. This is only a partial list of the features found in every TrueNAS Storage Appliance.

Call or Click Today!

855-GREP-4-IX (US) | 408-943-4100 (non-US) | ixsystems.com/TrueNAS

2490 Kruse Drive | San Jose, CA 95131



HARDWARE SPECIFICATIONS

TRUENAS M40 - ALL-FLASH

- All-Flash Unified Storage
- High Availability option
- Up to 540 TB SSD capacity
- 128 GB RAM for read cache
- NVDIMM for write cache
- Up to 5 GB/s and 600K IOPS
- Up to 2x40GbE Interfaces per node
- Up to 2x16 Gb Fibre Channel Interfaces per node
- Maximum power draw*
 - 779 Watts

POWER MANAGEMENT

- Dual redundant Hot-Swappable high-efficiency (90%+) power supplies
- Remote power-on/off
- UPS Signal Response and Alerts

TRUENAS M50 - ALL-FLASH

- All-Flash Unified Storage
- High Availability option
- Up to 1620 TB SSD capacity
- Up to 1.5 TB RAM for read cache
- NVDIMM for write cache
- Up to 10 GB/s and 800K IOPS
- Up to 4x100GbE Interfaces per node
- Up to 4x32 Gb Fibre Channel Interfaces per node
- Maximum power draw*
 - 905 Watts

AVAILABLE DRIVES

- Performance (12 Gb/s) SSD: 0.96 TB/1.9 TB/3.8 TB/7.6 TB SSD
- Read Intensive (6 Gb/s) SSD: 3.8 TB/7.6 TB SSD

TRUENAS APPLICATIONS

- Performance Virtualization (VMware, OpenStack, Hyper-V, Xen, Kubernetes)
- Virtual Desktops (VMware, Citrix)
- Databases (MySQL, Postgres, Oracle XE/SE)
- Metadata Servers (DNS, DHCP, Hadoop)
- Single Server Apps (Splunk, Elastic, Custom)

DRIVE MANAGEMENT

- Global Hot Spares
- Hot-Swappable drives
- Bad Block Scan + S.M.A.R.T.
- Enclosure Monitoring and Alert LEDs
- ISO Mounting Support
- Drive Activity/Alert LEDs
- Self-encrypting Drives (TCG Opal 2.0, FIPS)

PHYSICAL PARAMETERS

- Redundant Storage Controllers
- Dimensions (LxWxH) 27x19x7 inches | 686 x 483 x 178mm
- Operating Temperature: 0°C to 35°C
- Non-operating Temperature: -10°C to 70°C
- Humidity: 5% to 95% non-condensing
- RoHS 6/6 compliant, CE, FCC Class A, UL

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* Maximum power drawer is estimated for head unit without SSDs populated. Assume an additional 11W per SSD.