TrueNAS M-Series Turns Tech Buzz into Music

NVMe and other advances in non-volatile memory technology are generating a lot of buzz in the enterprise technology industry, and rightly so. As providers integrate these technologies into storage systems, they are closing the gap between the dramatic advances in processing power and the performance of the storage systems that support them. The TrueNAS M-Series from iXsystems provides an excellent example of what can be achieved when these technologies are thoughtfully integrated into a storage system.

DCIG Quick Look

In the process of refreshing its research on enterprise midrange arrays, DCIG discovered that the iXsystems TrueNAS M-Series all-flash and hybrid storage arrays leverage many of the latest technologies, including:

- Intel® Xeon® Scalable Family Processors

- Large DRAM caches
- NVDIMMs

- NVMe SSDs

- Flash memory

- High-capacity hard disk drives

The TrueNAS M-Series lineup comprises two models: the M40 and the M50. The M40 is lower entry cost, scalable to 2 PB, and includes 40 GbE connectivity with SAS SSD caching. The M50 scales to 10 PB and adds 100 GbE connectivity with NVMe-based caching.
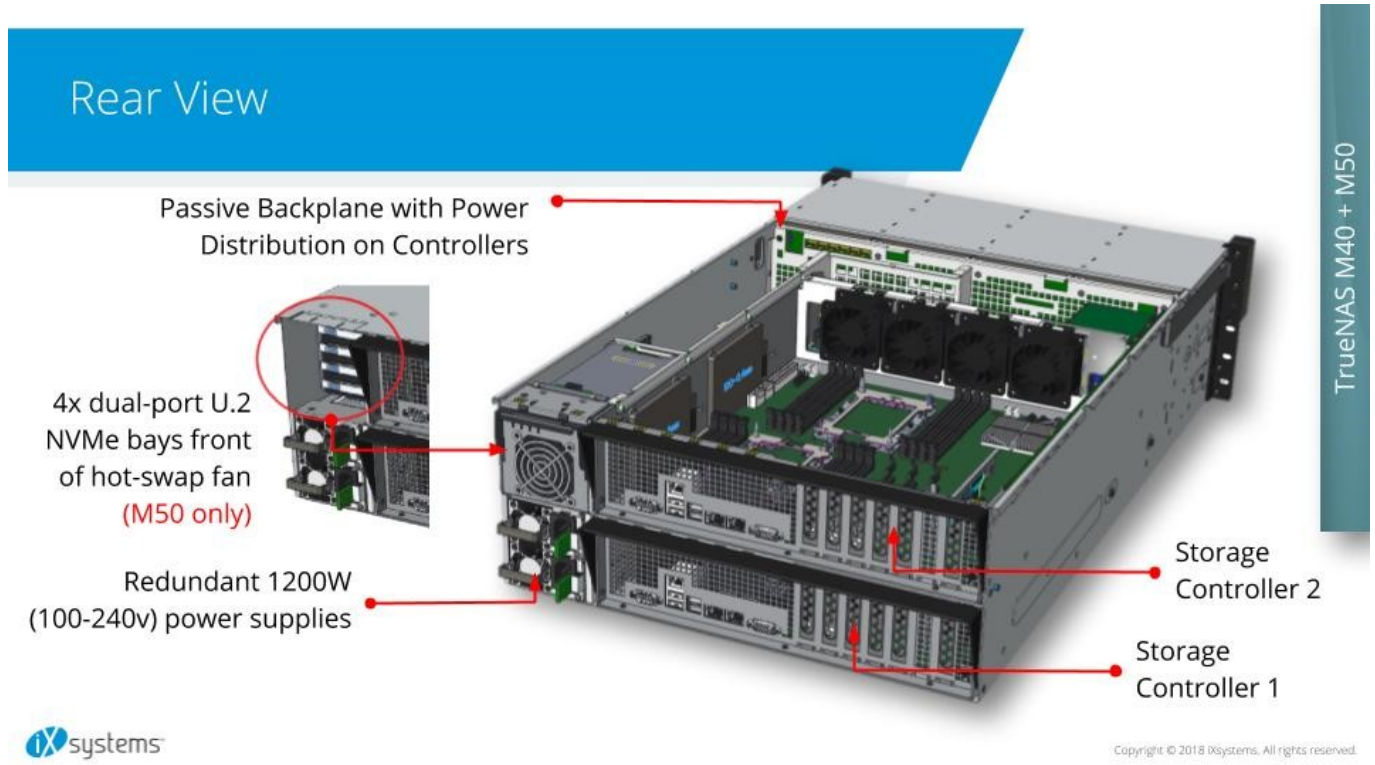
Both models come standard with redundant storage controllers for high-availability and 24×7 service. Though single-controller configurations are available for less critical applications.

Advanced Technologies in Perfect Harmony

DCIG analysts are impressed with the way iXsystems engineers have orchestrated the latest technologies in the M50 storage array, achieving maximum end-to-end cost-efficient performance.

The M50 marries 40 Intel® Xeon® Scalable Family Processor cores with up to 3 TB of DRAM, a 32 GB NVDIMM write cache and 15.2 TB of NVMe SSD read-cache in front of up to 10 PB of hard disk storage. (The M-Series can also be configured as an all-flash array.) Moreover, iXsystems attaches each storage

expansion shelf directly to each controller via 12 Gb SAS ports. This approach adds back end throughput to the storage system as each shelf is added.

iXsystems TrueNAS M50

This well-balanced approach carries through to front-end connectivity. The M50 supports the latest advances in high-speed networking, including up to 4 ports of 40/100 Gb Ethernet and 16/32 Gb Fibre Channel connectivity per controller.

TrueNAS is Enterprise Open Source

TrueNAS is built on BSD and ZFS Open Source technology. iXsystems is uniquely positioned to support the full Open Source stack behind TrueNAS. It has developers and expertise

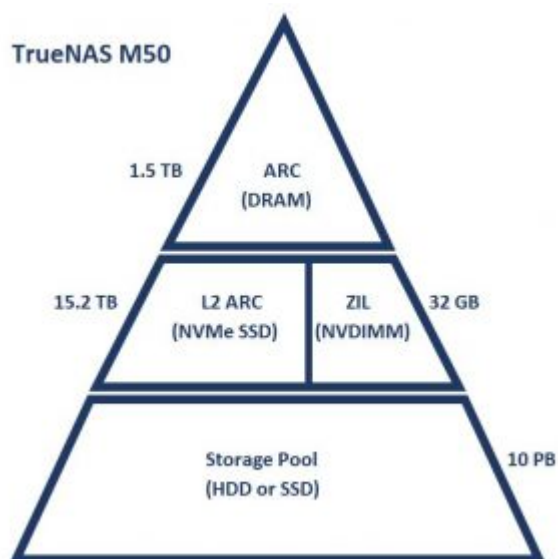in the operating system, file systems and NAS software.

iXsystems also stewards the popular (>10 million downloads) FreeNAS software-defined storage platform. Among other things, FreeNAS functions as the experimental feature and QA testbed for TrueNAS. TrueNAS can even replicate data to and from FreeNAS. Thus, TrueNAS owners benefit from the huge ZFS and FreeNAS Open Source ecosystems.

NVM Advances are in Tune with the TrueNAS Architecture

The recent advances in non-volatile memory are a perfect fit with the TrueNAS architecture.

Geeking out just a bit…

ZFS uses DRAM as a read cache to accelerate read operations. This primary read cache is called the ARC. ZFS also supports a secondary read cache called L2ARC. The M50 can use much of the 1.5 TB of DRAM in each storage controller for the ARC, and combine it with up to 15.2 TB of NVMe-based L2ARC to provide a huge low-latency read cache that offers up to 8 GB/s throughput.

The ZFS Intent Log (ZIL) is where all data to be written is

initially stored. These writes are later flushed to disk. The M50 uses NVDIMMs for the ZIL write cache. The NVDIMMs safely provide near-DRAM-speed write caching. This enables the array to quickly acknowledge writes on the front end while efficiently coalescing many random writes into sequential disk operations on the back end.

Broad Protocol Support Enables Many Uses

TrueNAS supports AFP, SMB, NFS, iSCSI and FC protocols plus S3-compliant object storage. It also offers Asigra backup as an integrated service that runs natively on the array. This broad protocol support enables the M50 to cost-effectively provide high performance storage for:

- File sharing
- Virtual machine storage
- Cloud-native apps
- Backup target

All-inclusive Licensing Adds Value

TrueNAS software licensing is all-inclusive; with unlimited snapshots, clones and replication. Thus, there are no add-on license fees to negotiate and no additional PO's to wait for. This reduces costs, promotes full utilization of the extensive

capabilities of the TrueNAS M-Series and increases business agility.

TrueNAS M50 Turns Tech Buzz into Music

The TrueNAS M50 integrates multiple buzz-worthy technologies to deliver large amounts of low-latency storage. The M50 accelerates a broad range of workloads—safely and economically. Speaking of economics, according to the iXsystems web site, TrueNAS storage can be expanded for less than $100/TB. That should be music to the ears of business people everywhere.