

Avere Systems' FXT 2700 Tiered Network Attached Storage Appliance

Solid state drives provide a 10x improvement for performance-critical applications

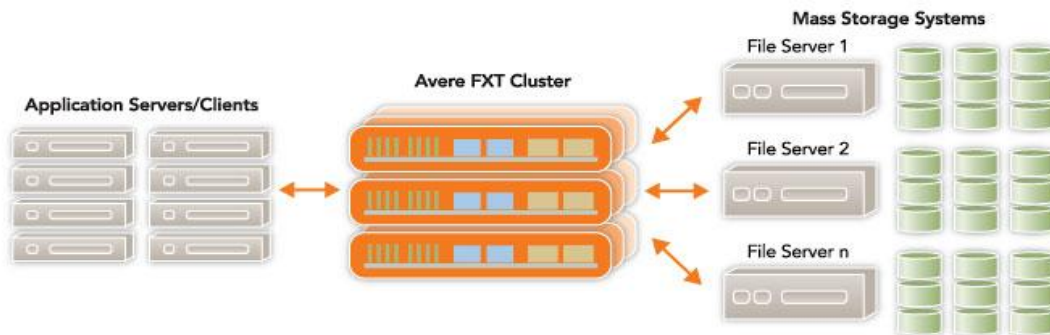
By James E. Bagley
 Senior analyst, Storage Strategies NOW
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Avere Systems has expanded its entries in the storage market with an all solid state drive (SSD) version of its tiered network attached storage (NAS) system -- the FXT 2700. Avere's unique approach allows customers to preserve their investment in rotating hard disk drive-based (HDD) NAS file systems while dramatically improving performance. Rather than adding expensive high performance HDDs or SSDs to existing filers, the FXT 2700 can speed heavy random read applications by a factor of 10x for all of customers' file systems.

This comes at a time when many organizations are trying to break the bottleneck that has developed as the amount of storage required has increased by several orders of magnitude while the access speed of HDDs has not changed in the last ten years. Multi-core servers and high-speed network connections can chew through data far faster than the storage systems can feed them. Organizations are looking to SSDs as a way to improve performance, but are often put off by the cost of upgrading or replacing their existing NAS filers and file systems.

Avere front-ends the NAS

The basic approach taken by the Avere FXT Series, including the all solid-state FXT 2700, is to sit between the applications servers/clients and the customer's existing NAS filers. This implementation makes a high-speed performance tier available to all file systems without touching them, allowing the customer to retain their investment in NAS appliances, and even expand the capacity of existing NAS with low-cost, high-capacity Serial ATA (SATA) drives. While many NAS suppliers have SSD options, the Avere approach allows the SSDs to improve the performance of all of the customer's existing file systems without having to add SSDs or performance-enhancing adapters to each filer.



Placement of the Avere appliance in the network allows it to automatically make decisions regarding the type of media to use for storing given sets of data. The hottest (most frequently accessed) data will remain in fastest tier automatically, without requiring storage administrators to worry about what data needs to be placed in a given tier. Likewise, data will be migrated onto slower media if its access rate declines. A cluster of Avere appliances will reduce the amount of operations going to and from the NAS filers behind it by 50:1. The only decision a storage administrator needs to make involves the requirement of writing data back to the NAS filers. A write-back feature included with the Avere software allows administrators to determine the frequency that data retained in the Avere appliance will be written to the NAS device behind it, primarily for backup or archive purposes.

Use cases

Customers can use the FXT appliances to extend the use life of their existing NAS systems. By upgrading the throughput of all network storage, existing systems can continue to be used without the usual fork-lift style upgrade. And because the colder (less frequently accessed) data remains on the existing NAS, capacity can be expanded with lower cost media. Multiple studies show that

about 5% of online data is accessed frequently; this would typically be metadata and recently created information. So, the addition of a relatively small amount of high-speed solid state memory can have a dramatic effect on overall throughput.

FXT product line architecture

The FXT 2700 is the third product in the line of appliances from Avere and the first to use exclusively solid state drives for its permanent storage. The FXT 2300 and FXT 2500 appliances both use high-speed (15,000 RPM) Serial Attached SCSI (SAS) HDDs for permanent storage. The SSDs in the FXT 2700 provide an order of magnitude higher speed for random reads than the fastest HDDs, and are several times faster for random writes.

All FXT appliances have 64GB of high speed Dynamic Random Access Memory (DRAM) and 1GB of non-volatile RAM. Writes are acknowledged as soon as they are placed in the NVRAM, without waiting for the SSD or HDD write to complete. The NVRAM allows the data to be written to the permanent storage after a power failure, without having to resort to a large uninterruptable power supply (UPS) for each appliance. Throughput is maintained by using 10Gbit/sec. Ethernet fabric for the application/client side, and is software configurable between 1Gbit/sec. and 10Gbit/sec. for either side of the network to a total of 20Gbit/sec.

Scalability

As many as 25 FXT 2x00 nodes can be configured on the customer network. 10Gbit Ethernet is the typical fabric for inter-node and application/client side. Each node provides additional overall bandwidth, and the networks can be configured to achieve customer requirements for throughput. On the filer side, 1- to 10Gbit connection can be soft-configured to support the constraints of existing systems. The preferred configuration would be a 10Gbit/sec. network for all attached devices, be they application servers/clients, nodes or NAS systems. The following table shows the configurations of the FXT product line.

Hardware Specification	FXT2300	FXT 2500	FXT 2700
DRAM	64GB	64GB	64GB
NVRAM	1GB	1GB	1GB
Enterprise SLC SSD	0	0	512GB
HDD 15K RPM SAS	1.2TB	3.6TB	0
Max Nodes per Cluster	25	25	25
Max SSD Per Cluster	0	0	13TB
Max HDD per Cluster	29TB	90TB	0
Height	2U	2U	2U
Max DRAM per Cluster	1600GB	1600GB	1600GB
Network Ports	*	*	*

* 2x10Gbit Ethernet + 2x1Gbit Ethernet or 10x1Gbit Ethernet

SSG-NOW Assessment

The Avere FXT 2700 gives customers an easy way to supercharge performance by providing a cost-effective, transparent, acceleration layer to an existing network attached storage infrastructure. As enterprise SSDs become available at higher capacity and lower cost, the amount of acceleration per accessed data set will continue to increase. Avere is positioned to exploit the continued improvement in SSD performance without substantial development and can scale to customer requirements over a wide range of installed NAS systems. We believe the FXT appliance architecture is uniquely positioned to achieve a major market impact.

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