# SOLUTION BRIEF

ATTO

Turn Your Current Direct-Attached Storage into a SAN

Safe, Simple SAN Solution using ATTO XstreamCORE® *i*ntelligent Bridges in a Virtualized Environment

Challenge

In a typical direct attached environment, with external serial-attached storage (SAS) arrays, it can take hours to complete the transfer of data from one ESXi host to another using vMotion® even when proper recommendations of an isolated vMotion network are followed. Aside from common load balancing migrations, the time it is most critical for vMotion to migrate a virtual machine (VM) is usually when the host resources are down or under duress. In these situations VMs running approximately 250-400 GB in size have been observed to take more than 30 hours to migrate. In these environments, the best way to avoid this scenario is the use of storage area network (SAN) technology. In a SAN environment these live vMotion migrations can take under three minutes, because all ESXi hosts are connected to all storage arrays.

Some customers may have shied away from implementing a SAN in the past due to a perception of higher costs when compared with other storage solutions. But consider the cost of not being able to access data for hours or days while it is being retrieved and rerouted via Ethernet to another ESXi host. Procurement, migration and implementation costs of a new SAN could easily exceed $200,000.
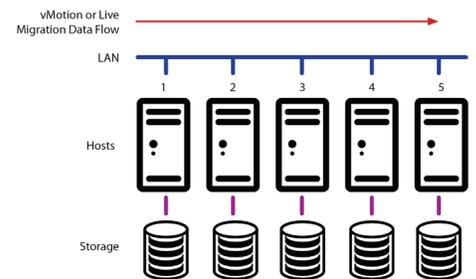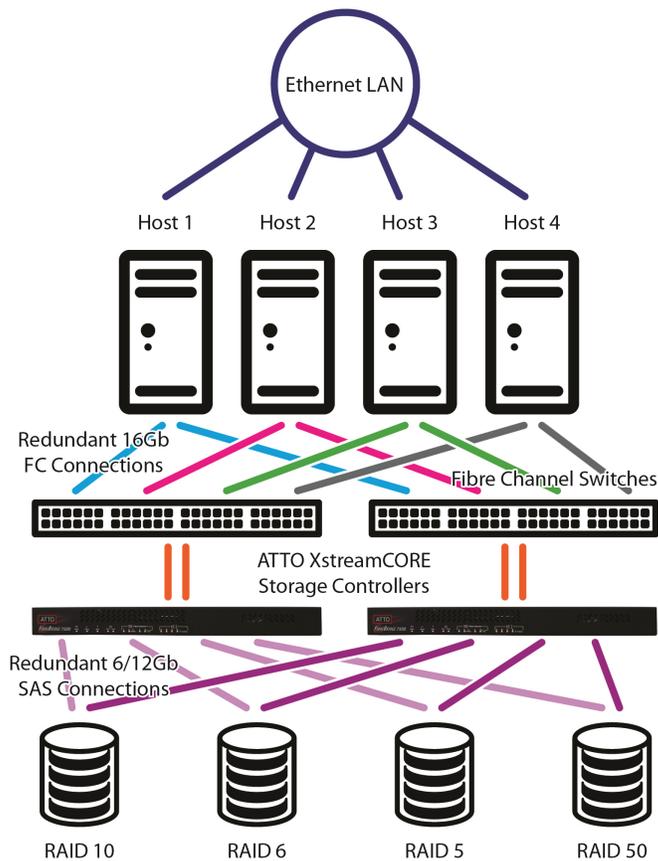

Solution

Using ATTO XstreamCORE® *i*ntelligent Bridges, system integrators can now build a high-performance SAN for their customers by using the existing SAS arrays. This increases the ROI of the existing hardware and increases performance by creating a 16Gb Fibre Channel fabric with 12Gb SAS support. Expansion is quick, uncomplicated and cost-effective using either existing SAS RAID arrays or JBOD/JBOF shelves for additional storage and cache expansion. Converting to a 16Gb
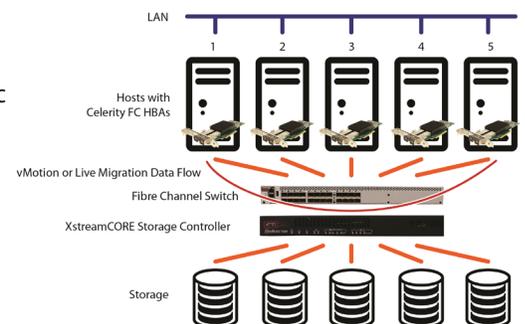
Fibre Channel network with 12Gb SAS support using ATTO XstreamCORE *i*ntelligent Bridges, including four dual port 16Gb Fibre Channel host bus adapters (HBAs), eight 16Gb Fibre Channel SFP+ modules, two 12 port 16Gb managed Fibre Channel switches and two XstreamCORE *i*ntelligent Bridges with small form pluggable (SFP) modules included, has an estimated street price of $51,900 and takes only about one hour of downtime to install on four ESXi hosts.

The fastest low-latency SAN solution is the use of a Fibre Channel SAN (sometimes called a fabric) which offers speeds of up to 16Gb/s (effectively 1,550MB/s) to the arrays (the storage is still typically only running at 6Gb/s). This requires dedicated and protocol-unique Fibre Channel switches, Fibre Channel HBAs for the hosts and Fibre Channel controllers in the arrays. The dedication of the Fibre Channel network to the storage means there is no contention on the network with server to server communication or user to server communication, as a Fibre Channel network is only for server to storage data passage using the Fibre Channel protocol. In this environment, hosts can access multiple separate SAS data arrays at full speed without contention for data bandwidth on the Fibre Channel fabric. Multipathing can allow for path redundancy and load balancing to provide even more bandwidth between servers and storage.

Solution Benefits

- Increases ROI and lifespan of existing storage solutions by quickly and cost effectively converting direct attached SAS RAID, JBOD or JBOF storage to high performance SAN technology

- Enables load balancing and an overall faster backbone

- Provides greater redundancy by allowing a rapid restart of VMs in the event of a host or storage failure

- Scales up with non-disruptive storage capacity additions, arrays can be added without shutting down a host

- Scales out with host additions without requiring new storage purchases

- Low internal latency through the XstreamCORE® means no additional delays

- All read and write data is accelerated in hardware

- Open and modular controller does not lock you into proprietary software or hardware

Ethernet LAN

Host 1   Host 2   Host 3   Host 4

Redundant 16Gb FC Connections

Fibre Channel Switches

ATTO XstreamCORE Storage Controllers

Redundant 6/12Gb SAS Connections

RAID 10   RAID 6   RAID 5   RAID 50

ATTO