

# Affordable High Availability (HA) Delivers Convenience, Value and Improved Response Time to Retail Branches

## HA-DAS Drives Localization of SQL Server Databases

### Introduction

Large businesses that operate through retail branches cannot afford to have product point of sale capabilities disabled for any period. This requires that product inventory and pricing databases stay up during any IT failure. A great way to minimize the risk of server failures bringing down the inventory and pricing database is for administrators to deploy HA servers at retail branch locations.

Up until now HA has been implemented through a storage area network (SAN) or network attached storage (NAS) infrastructure. The equipment cost, software overhead and administrative expertise has proven to be too much for many retail branches to deploy locally. In order to affordably manage the inventory and pricing databases across many retail branches in an HA infrastructure, businesses have operated these applications from a central office. This model has contributed to sluggish inquiry responses, restrictive local database management and longer transaction times for store branches with large-detailed inventories.

A direct attached storage (DAS) HA server infrastructure can drive down deployment and administrative costs so that inventory and pricing databases can be managed locally. Retail branches with large inventories that can support these databases locally see a faster response to inquiries, improved capability to manage product locally and shorter transaction times.

### LSI® High availability Direct Attached Storage with Microsoft® Windows Server® 2012

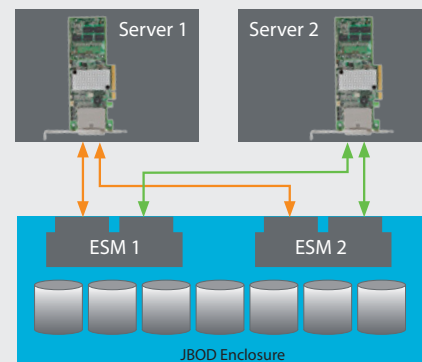
LSI HA-DAS allows administrators to use volume servers and a low-cost, off the shelf JBOD to build simple, high-availability servers for applications and storage. System builders can see a significant cost savings compared to a SAN and NAS HA infrastructure. In addition, by utilizing the Failover Cluster Manager Utility within Microsoft Windows Server 2012, administrators are able to configure and deploy high-availability servers quickly, without additional software or expertise.

By using the serial attached SCSI (SAS) storage interconnect as a high-availability server backbone, LSI HA-DAS solutions help eliminate the need for additional hardware or software applications and can deliver higher performance and reduced failover latency. And by leveraging LSI MegaRAID® technology, applications can take advantage of RAID 5 data protection and solid state drive (SSD) acceleration features not always available with software clustered storage. (See Figure 1)



**Figure 1:**  
LSI Syncro CS 9286-8e  
Two Server Cluster Solution

- Two separate servers, each with a Syncro CS 9286-8e controller card
- External storage shared across servers
- Required shared storage – JBOD(s)
- No change required to server architecture



### Example of a Retail Store Branch Environment Needing High Availability: XYZ Auto Parts

XYZ Auto Parts is a nationally operated retailer of automobile parts that operates over 60 stores across the United States. (See Figure 2) Each store has its own inventory of thousands of parts and products. XYZ also manages a distribution center in Wichita, Kansas that maintains supply at each store but also sells product through its online auto parts store on the web.

Each of the 60+ stores that XYZ operates has a small IT budget that totals around \$15,000 for equipment costs. Today this budget is primarily used for communication and security at each store. An administrator checks in once every couple of weeks to back up data and make sure the local systems are performing.

Each store must maintain 100% uptime of point of sale during business hours. Inventory and product pricing is managed through a database in a HA server environment ensuring against failures affecting point of sale. Because of the high cost of deploying separate HA servers today, this single SQL Server-based database is located on a SAN server cluster at the XYZ Auto Parts central office accessed through the company's VPN.

Figure 2:  
Example of  
Environment  
Needing High  
Availability

Auto Parts Store Branch Office- Major Chain	
Application	Inventory and pricelist lookup database, running on SQL Server
Requirements	
Application Uptime	100% during business hours
End Users	Primarily local at store branch. Need access at central office for inventory control Data may be concurrently accessed by web clients and inventory managers
Administration	On-site once a week for general maintenance
Budget	\$15000 per store annually for infrastructure hardware
Current Configuration	
Location	Database configured and operated at central office
Configuration Type	Multi-server SAN
Connection to Local Store	Ethernet
Characteristics	Slow. Large latencies due to distant WAN and complex SAN infrastructure Difficult to make manual changes at the local store branches due to restrictions

### What Can XYZ Auto Parts Improve at the Branch?

XYZ offers quality product and top-notch service to customers seeking automobile parts that most stores don't carry. This flexibility creates a product breadth that tests the limits of everyday retail inventory databases. Housing each of the databases from all 60+ stores at the central office demands a huge multi-tiered server-storage environment.

This gigantic server-storage infrastructure that houses each store's database presents a couple major issues for the store branches around the country. The databases have been deployed in a common restrictive configuration for all of the stores abroad. This makes it very difficult for local stores to make manual changes in the system outside of transactions. Managers in each store are unable to offer specials on parts that are overstocked or bundle products under a single reduced price because of restrictions on the central office database.

More significantly, product inquiries and point of sales transactions are noticeably slow. In the auto parts business this is a major problem as many customers have limited time to spend in the store, stopping through during their lunch hour or on their way home from work.

Navigating the database and finding the right part can take many minutes to get through. And waiting in line at the checkout can hold each customer up twice as long.

It is clear that the multi-tiered server-storage environment located at the central office is restricting response time because of distance and infrastructure complexity. Additionally, the inability to make manual changes is preventing store managers from providing offers that will reduce overstock inventory and bring in new customers.

XYZ Auto Parts could benefit from localizing their inventory and pricing database in a simplified high-availability infrastructure at each retail store

### What HA-DAS Has to Offer for XYZ Auto Parts Stores

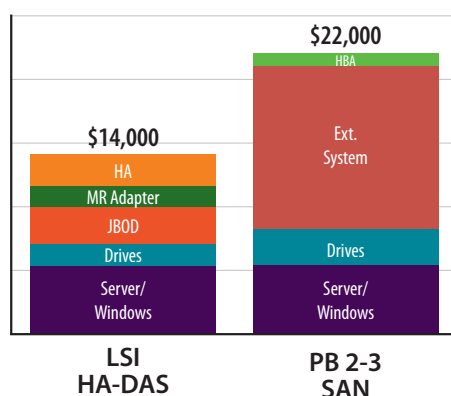


Figure 3: Estimated Cost of a LSI HA-DAS Configuration vs. PB 2-3 SAN HA Configuration

The primary limiting factor on bringing the inventory and pricing database into individual retail branches is cost. Because XYZ cannot afford its point of sale to go down for any period of time, a high-availability server-storage cluster infrastructure is required.

If XYZ was to implement an existing SAN-based HA solution in each retail store, it could pay an estimated \$22,000 per HA server cluster. This includes the cost of the servers, OS licenses, storage controllers, hard drives and SAN system. In addition, the configuration may require additional SAN software and greater administrator expertise. Configuration may take several hours to build the high-availability server in a complex SAN environment. This falls outside of the \$15,000 IT budget allotted to each retail branch for their server infrastructure.

The LSI HA-DAS solution fits within the \$15,000 server infrastructure cost envelope. HA-DAS can be deployed for around \$14,000. This includes cost of the servers, OS licenses, HA-DAS controllers, hard drives and the JBOD enclosure. (See Figure 3) The configuration could be deployed entirely using the Microsoft Windows Server 2012 Failover Cluster Manager without any additional management software. High-availability server configuration could take minutes once the servers and storage are cabled together.

Once the HA-DAS server-storage cluster is deployed, the retail branch would be able to load its inventory and pricing database along with the existing security and communication applications already present locally. The SQL-based database would synch-up periodically with the central office for top-level inventory management. Local configurations would be less restrictive to manual changes, allowing managers to place overstock items on special and bundle products more easily. Most importantly, parts lookup would take a small fraction of the time that it currently takes and the checkout line would move much faster, turning a 20 minute trip to the auto parts store into a 5 minute trip.



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