



Case Study:

InfiniBand boosts transaction speeds for Mega Retail Company

A well-known textile retail company wanted to use SSDs in their storage servers to get faster transaction speeds, but interconnect with the servers was a bottleneck, which Netweb Technologies resolved with InfiniBand based storage solution

CHALLENGE:

- With the increase in business from increasing number of stores and expanding product lines, their existing system infrastructure wouldn't have been able to cope with increasing transactional demands.
- Required a central storage solution that would be connected to all their branches across India for doing online real-time transactions, therefore wanted a high IOPS delivering solution.
- Wanted to adopt SSDs in storage servers but faced the difficulty of delivering the throughput of the SSDs to the main servers, as the overall throughput is limited by the throughput of the interconnect being used.
- Sought a solution that could be scaled up to meet their anticipated future network and storage needs.

SOLUTION:

- Opslag FS2, a unified storage solution from Tyrone Systems having InfiniBand as interconnect along with 8 blade servers from SuperMicro were chosen by the retailer for their hosted datacenter.

BUSINESS RESULTS:

- Using InfiniBand as Interconnect, the client was able to fulfill their main requirement of high IOPS, as SSDs deliver 20-30k IOPS; and InfiniBand is able to deliver this high throughput to main servers.
- Now transactional speeds with database servers are fast, therefore, each store across India is lodging their sales activity on real-time basis rather than on a day-end basis.
- Any store owner who's out of stock for a particular item, can now check the inventory status for that and even know which other store of the retailer is having the stock of that item.
- Savings in terms of costs, as InfiniBand is a cost-effective solution when compared to Fibre Channel.

EXECUTIVE SUMMARY

Customer Name:

Well-known Indian Textile Retail company

Industry:

Retail Textile

Corporate Office:

NewDelhi, India

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DEPLOYMENT ENVIRONMENT:

- Opslag FS2 box having 72 bays with InfiniBand ports.
- 64 bays are populated with SSDs configured on RAID 5 and which are used for online transactions, while rests have SAS drives which are used for volume backups.
- 8 Blade Servers running on MS Windows Server and having database server as MS SQL Server.

TYRONE OPSLAG FS2 UNIFIED STORAGE

- FS2 is a unified storage solution that offers high performance, high availability, and flexibility through multiple configuration options as the storage box supports variety of protocols and interconnects like InfiniBand.

For complete information on Tyrone Opslag FS2 unified storage, visit

<http://www.tyronesystems.com/unifiedstorage.html>

This well-known retail company had started more than 50 years ago as a one-man export company, and today become a large Indian retail chain store with over 170 stores across India and abroad. In recent years the company had also ventured into the online space as well for retailing their products range of textiles and handicrafts.

Challenges:

Unlike other retail chain stores in India, the client was doing online real-time transactions from all the stores across India, whereas the principle that other retail chains usually follow is to update the central servers through day-end transaction. This allowed the client to have the view of real-time business transactions and inventory stock from all stores at their central database. The retailer has more than 30,000 SKUs listed in their database. As the transactions were being made at a central database, the retail stores faced time lags in completing the customer's billing. Since the client had expanded their number of stores in recent times, they didn't have sufficient network as well as storage bandwidth. Also, as the company was foraying into the ecommerce space and planning to setup their own website for selling their huge products range; the management decided to go for a complete overhaul of their datacenter to suffice their growing storage and network demand. They wanted a solution that would not cause any delays due to heavy traffic demands and would also make them future proof in a cost-effective manner. The client decided to implement a setup for their datacenter that could address their following requirements: -

- **Delivering SSD throughput to Servers:** Envisaging the heavy traffic demands, the client wanted an extremely fast storage system with extremely high throughput and bandwidth. Because of this, their IT admins wanted to adopt SSDs in their storage servers, as SSD can deliver up to 20k to 30k IOPS as compared to a traditional 15k RPM hard drive that delivers merely 200 IOPS. The challenge they faced was of delivering the high throughputs of the SSDs to the central servers, as the throughput gets limited by interconnect between server and the storage. Since, the client was clear that they wanted a common storage system for their servers, and not a storage residing within the servers; hence the challenge was to select a proper medium of interconnect that could match the throughput of the SSDs in the storage servers and help deliver the SSD's high throughput to the main servers.
- **Future-proof and Cost Effective:** As the company was planning to expand their number of stores and venture into the ecommerce space, they needed a solution that would be scalable enough to meet their future requirements and would also be cost

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effective in long-run without escalating the company’s budget.

Solution:

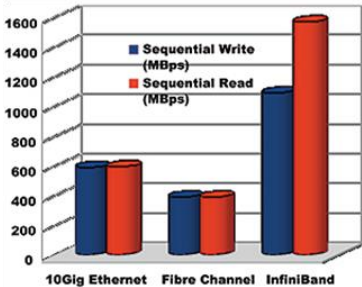
The company’s unique requirement was to resolve how to deliver high SSDs throughput across to the main servers. Netweb Technologies proposed the solution as InfiniBand to be used as the interconnect. The company was also demonstrated a POC (proof of concept) of InfiniBand performance as interconnect between SSD based storage server and main servers by the Netweb Technologies. And after ascertaining that InfiniBand can deliver the SSD throughputs to the main servers, the company went ahead with the whole solution deployment, which consisted of Tyrone Opslag FS2 unified storage and Supermicro Blade servers. Below are few reasons why the company chose Tyrone Opslag FS2 unified storage solution: -

- Opslag FS2 provided breadth of features that fulfilled the client’s requirements from the storage solution. With 72 bays in the storage box, the retailer populated 64 bays with SSDs which were configured on RAID 5 and used a transactional volume, while rest of the bays were populated with SAS drives that formed the volume to keep the backup. In future, if they need to scale the storage, they can stack additional storage box as Opslag FS2 supports JBOD.
- Opslag FS2 natively supports InfiniBand besides, 10 GbE and Fibre Channel, providing flexibility of choices for interconnect between storage and main servers. Therefore, the client didn’t have to make provision for additional licenses for using InfiniBand in Opslag FS2; they only had to pay once for the hardware, i.e., InfiniBand adapter for the box.
- Opslag FS2 supports high performance computing, thus it can handle high number of simultaneous requests, therefore now the transaction completion time has reduced drastically, and the downtimes have been eliminated completely.

Why InfiniBand was Ideal:

Though Fibre Channel could also have been adopted as an interconnect for the client’s storage system, Netweb Technologies deemed InfiniBand as ideal choice because of following characteristics of InfiniBand: -

- **Higher Throughput:** The current generation of InfiniBand offers 56 Gbps of throughput (though for the client 40Gbps QDR InfiniBand was used), which still is more than twice of what Fibre Channel (FC) has to offer. Besides this InfiniBand supports RDMA transport in native mode and has low CPU overheads because of that. While FC and SAS are typically associated with block protocols, InfiniBand



The graph shows speed comparison of different Interconnect

on other hand supports both File and Block protocols, making it ideal for Opslag FS2 which is a unified storage solution SAN that can be used as NAS (File protocol) and SAN (block protocol).

- **Simpler Networking:** Beauty of InfiniBand is that it can be used in Ethernet emulation mode, under which the InfiniBand can be configured to work like an Ethernet adapter, due to this the OS sees InfiniBand as an Ethernet card so we can use TCP/IP protocols over it. The other advantage of InfiniBand is that it can be used as single-point interconnect for both networking as well as data. This allows you to combine the Ethernet traffic as well as storage in one cable instead of having separate cable for both, hence simplifying the network cabling infrastructure.

- **Cheaper than FC:** The overall implementation of InfiniBand is cost effective than



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FC, as an FC switch comes with just four ports enabled, and to enable additional ports, one must obtain the license from the FC switch provider. Whereas InfiniBand switches firstly cost less than what FC switch costs, and secondly have all their ports enabled; thus, there is no additional overhead of cost incurred in enabling InfiniBand ports when scaling up the infrastructure. Also, the InfiniBand adapters cost less to FC adapters.

InfiniBand being the fastest interconnect, and being cost effective to Fibre Channel, was rightly selected by Netweb Technologies to be implemented for the retailer as the choice of interconnect to resolve their challenge of delivering the high throughputs of SSD drives to the main servers.

Benefits:

With the deployment of 8 Supermicro Blade servers connected to central Opslag FS2 unified storage system on InfiniBand backbone; the client has been able to meet all their expectations from this.

- **Extremely Fast Storage:**
 - On InfiniBand backbone, the company can harness the extremely high throughputs rate of the SSD storage and deliver the same throughput via high bandwidth to the main servers. As the company does all their transactions online in real-time basis connected to the central database, now there is no time lag in execution of the queries and the time taken for the billing process has significantly been brought down.
- **Cost:**
 - The overall cost of ownership with Opslag FS2 storage system along with the InfiniBand backbone is comparatively lower to that of other competing brands. Also, the pricing model of Tyrone Systems is inclusive of all licenses for all the features provided by the Opslag FS2 unified storage box, so the company doesn't have to shell out any additional charges towards InfiniBand support, which was the case with other competitor products where license has to be bought for using InfiniBand feature.
- **Future-Proof:**
 - Keeping in view with their expansion plans and the plan to host ecommerce portal on their storage platform, the company wanted to have a storage solution that could meet all their future requirements for storage expansion as well as for future technology upgradation. Opslag FS2 caters to these demands and provides flexibility for expansion options through JBOD to stack and increase the storage capacity.

* Disclaimer for Case Study

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