Reduxio and Mellanox Deliver Ethernet-based Flash Storage for Enterprises and Clouds

iSCSI-based enterprise flash storage provides breakthrough data efficiency and performance

Challenges

The advent of high performance flash storage and cloud computing have made the traditional storage infrastructure outdated. Legacy systems lack the agility, scalability, and efficiency required by today's applications for data processing, storage, and management. For primary data storage, flash-based storage has become the new paradigm for enterprise data centers and clouds.

In this new paradigm, disk-based storage is rapidly being replaced with faster flash storage systems, taking a significant share of enterprise and cloud storage capacity. To cope with complex data center storage requirements, priority is being given to efficient provisioning of storage, guaranteed performance, and simplicity in deployment and management. At the same time, enterprise-class storage capabilities in data integrity and reliability must be maintained. In addition, a fast and reliable network protocol is essential to unlocking flash performance and eliminating the bottleneck in transferring data.

iSCSI on the Rise, FC in Decline

Ethernet was originally defined as a best-effort network and used as the primary protocol in data centers for compute traffic. Ethernet allowed for frames to be dropped during congestion and relied on TCP/IP to provide reliable data transfer. This, along with the speed advantage of Fibre Channel when the primary Ethernet network connectivity in the data center was 1Gb, meant that FC was the preferred networking protocol for SANs of the previous generation.

Extensions to the Ethernet protocol suite introduced in the past decade have enhanced both the efficiency and reliability of Ethernet at higher speeds, such that Ethernet is no longer disadvantaged compared to FC in terms of reliability or efficiency. Modern Ethernet has been outpacing FC. At 10G, Ethernet provides much faster SAN connectivity compared to the most commonly deployed FC fabrics, providing a speed advantage for iSCSI. At 40/50/100G, Ethernet is faster than the fastest FC network available in the market today and for the foreseeable future. More importantly, Ethernet supports all sorts of data traffic, while FC only supports block storage traffic. For modern converged data centers, Ethernet has become the

> "At 10Gbps or higher, Reduxio iSCSI storage and Mellanox networking provides the best storage solution for enterprise data centers. Supporting both 10GbE and 40GbE in the same platform, the Reduxio and Mellanox solution allows customers to move to a single unified fabric instead of disparate networks, for today's and future applications."
>
> - Jacob Cherian,
> VP of Product Strategy,
> Reduxio

interconnect of choice, and iSCSI is now widely adopted in modern block storage infrastructure.
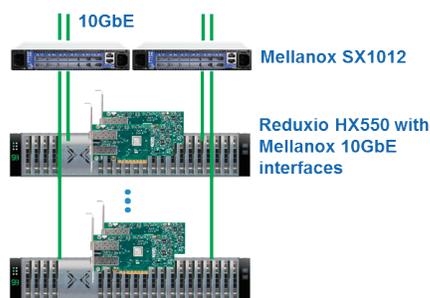
Reduxio iSCSI Enterprise Flash Storage

Reduxio designs its iSCSI-based enterprise flash storage with innovative technologies that provide ground-breaking performance, efficiency, and data management capabilities. The key innovations and value for enterprise customers include:

- Recovery to Any Second: Reduxio's BackDating™ technology makes legacy snapshot technology obsolete and allows users to instantly recover applications and data to any second. At the same time, BackDating eliminates the overhead of creating and managing snapshots, schedules, and consistency groups.

- Flash for Every Application: Reduxio Storage combines flash and disk in a single system that is tuned for primary enterprise workloads. Based on NoDup™, Reduxio's always-on, in-line, in-memory dedupe and compression, and on Reduxio's Tier-X™ tiering engine, Reduxio Storage provides the most cost-effective storage solution available today for demanding performance intensive enterprise workloads.

- Eliminate Complexity: Fabric, capacity, snapshot, and consistency group management are no longer needed. Installed and operational in 15 minutes, Reduxio Storage eliminates much of the complexity in managing a storage system.

Mellanox 10/40G Ethernet Solution

Storage traffic requires a lossless network and very little jitter. The rise in the use of flash storage demands a faster network – higher throughput and lower latency. Mellanox 10G Ethernet switches and adapter cards make a perfect fit for these requirements.

10GbE

Mellanox SX1012

Reduxio HX550 with Mellanox 10GbE interfaces

Each Reduxio HX550 Flash Storage solution has dual redundant controllers with two iSCSI 10GbE SFP+ ports per controller. Each controller's 10GbE iSCSI ports use Mellanox ConnectX®-3 Pro dual-port interface adapter technology. The Reduxio HX550's iSCSI ports can be connected to Mellanox 10/40 Gigabit SwitchX®-2 Ethernet switches to create a high-speed storage network for the most demanding enterprise applications.

Mellanox makes industry-leading high performance end-to-end Ethernet products, from switches and network adapter cards to cables and transceiver modules. The Mellanox Ethernet solution delivers the following benefits:

- Latency acceleration for storage servers: Mellanox network adapters deliver high performance and provide network offload functions to significantly improve the CPU utilization for applications.

- True non-blocking switches with the most predictable network performance:
  - Mellanox switches are able to forward at full line rate for any packet size and port combination
  - 220ns latency with very little variation at any packet size and IO pattern
  - Zero packet drops at any speed

- 10G today and 40G ready: No switch replacement. A simple cable change is all that is required to change the switch port speed from 10 Gigabit Ethernet to 40 Gigabit Ethernet. Ideal for users to migrate to a single unified network to fully utilize the power of Reduxio Flash Hybrid Storage

- Simple to use and flexible for various configurations:
  - SX1012: The industry's smallest 40 Gigabit-capable switch, supporting 1G/10G/40G operation. It has 12 ports with the option to scale to 48x 10G ports with splitter cables. Its half-width form factor allows placement of two SX1012s side-by-side in a single 1RU slot.
  - SX1410: 1RU form factor with 48x 10G ports and 12x 40/56G uplink ports. Configurable to 54x 10G ports and 8x 40/56G uplinks

- Easy to deploy and manage: Mellanox Ethernet switches are easy to install and configure. REST-based Mellanox NEO™ allows networking configuration and management of a Reduxio configuration in one mouse click.

- Best price/performance Ethernet solution: Best performance/latency, compact design, and low power consumption improve rack and server efficiency, thereby reducing the total cost of ownership

Conclusion

iSCSI-based storage is widely being adopted, based on the ubiquitous Ethernet infrastructure and faster and more reliable Ethernet protocols. The Reduxio iSCSI Flash Hybrid Storage and the Mellanox Ethernet solution eliminate the complexity of traditional storage, deliver breakthrough data efficiency and performance, and provide the unique ability to recover data to any point of time for enterprise data centers.

About Mellanox

Mellanox Technologies is a leading supplier of end-to-end Ethernet interconnect solutions and services for enterprise data centers, Web 2.0, cloud, storage and financial services. More information is available at www.mellanox.com.

About Reduxio

Reduxio Systems's groundbreaking BackDating™ technology allows customers to recover applications and data to any second. Reduxio's high-performance flash storage systems with BackDating™ is the most cost-effective storage solution for demanding enterprise workloads. Learn more at www.Reduxio.com.

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