

Flash-based Virtualized Server Platform Connected by 40GbE Mellanox Switches

40GbE Mellanox Switches Unlock the Performance of All Flash Storage

Background

To cope with the increasing number of users and applications, Korea Consumer Agency (KCA) has embarked on a project to construct their newest data center. KCA set three requirements for their new data center: high performance for mission-critical applications and continued improvement in user experience; server consolidation for better resource utilization and reduced OPEX; and flexible configuration for future expansion.

As server virtualization has become common practice in today's data centers, KCA has sought to consolidate their servers onto a virtualized server platform. Web application servers and database servers run on virtualized servers on the platform, sharing the storage in iSCSI SAN. A backup server is also connected to the SAN, as well as the Stratus system, which provides fault tolerance to the entire platform.

For seamless migration and non-disruptive operation, database servers and Web application servers must run at a performance level as if they were on dedicated physical servers. To achieve that, high performance storage and networking are essential.

Solution

Flash storage is now widely used in data centers, driven by orders of magnitude

increases in IOPS and by a narrowing of the \$/GB price gap compared to hard disk drives. All flash arrays (AFA) are flash storage systems that deliver flash performance while maintaining enterprise-class features in traditional storage arrays. With its high performance, AFA enables more applications per server, and that server consolidation will reduce costs associated with server hardware, software licenses, and operating expenses. KCA chose Pure Storage's all-flash system as the storage for its new platform, to take advantage of the following benefits:

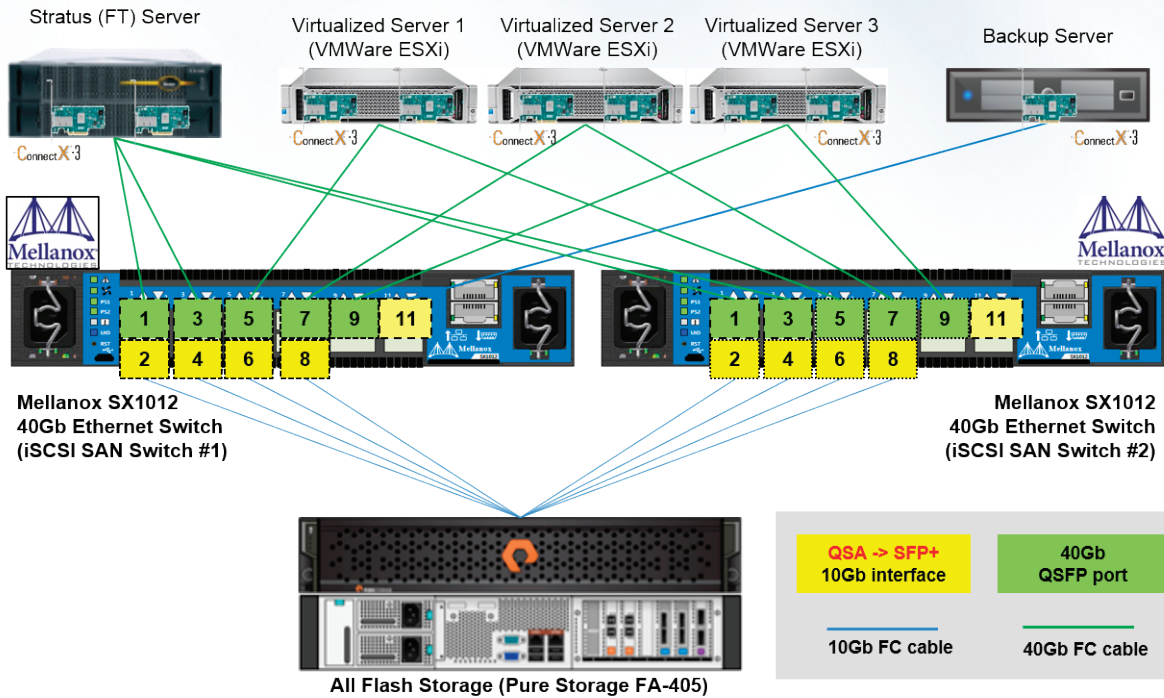
- High performance flash storage with up to 90% space and power reduction
- Enterprise-class storage with high availability
- Modular scale and simple management

To fully utilize the high performance and low latency of the flash storage, and to provide adequate bandwidth for virtualization servers, high-speed Ethernet switches are also required. Mellanox SX1012 10/40G Ethernet switches were selected as iSCSI SAN switches in KCA's platform. As shown in the network diagram below, SX1012 provides full-speed 40G connections to front-end servers (virtualized servers, backup server, and the Stratus system), while providing 8x 10G connections to back-end Pure Storage nodes. In addition, Mellanox 40G ConnectX-3 network adapter cards are used in front-end servers.

"We are using four Pure Storage nodes with two 10GbE interfaces each, so we needed a small form factor ToR. Mellanox SX1012 was the ideal switch for us, with 12 ports running 10GbE or 40GbE. By using a 40GbE-ready switch, we know that we will not have to replace the switch once a 40GbE front end becomes available. The best part is that the switch does not cost more than 10GbE alternatives."

Mr. TaeJin Song
IT Manager,
Korea Consumer Agency

Mellanox 40G Ethernet Switch, based iSCSI SAN Configuration



Key benefits of Mellanox SX1012 Ethernet Switch

- Compact size (1RU half width) and redundant power supply
- Low network latency, unlocking high performance of all-flash storage
- Full line-speed connection and low/predictable latency at any packet size, enabling more VMs and various workloads on virtualized servers
 - » 40G connection, reducing the number of cards in the server
 - » Combined, more VMs and fewer cards helps in server consolidation and the compact rack design of the KCA platform
- Flexible 10/40G port configuration, paving the way for future expansion
- Simple configuration and management interface

Conclusion

High performance Pure Storage flash systems and Mellanox 40G Ethernet switches enabled KCA to build its new data center on a virtualized server platform. Leveraging much higher performance and lower latency from storage and networking, KCA was able to consolidate its servers by running applications as VMs on virtualized servers, thereby reducing the TCO of the new data center. In particular, the Mellanox SX1012 switch is the perfect TOR switch for this platform, providing both 10G and 40G interconnect to front-end servers and back-end flash systems. In addition, its flexible port configuration makes it easier for future system upgrades and expansions.



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