SEOUL
NATIONAL
UNIVERSITY

Mellanox
TECHNOLOGIES

SNU Upgrades Pivot3 with 40 Gigabit Ethernet

Increasing VDI Performance with Flash-based Storage and 40 Gigabit Ethernet

Background

For months, the Seoul National University (SNU) IT team experienced performance and stability issues with VM migration, workload provisioning, and generally less optimal service behavior of their VDI installation. After performing extensive troubleshooting and root cause analysis, the SNU IT team found that the flash-based Pivot3 hyperconverged platform was capable of delivering superb performance. What was gating the performance of the overall VDI infrastructure was the original 10 Gigabit Ethernet switches connecting the Pivot3 high-speed interfaces. These old 10Gigabit switches were throttling the inter-node communication paths.

Solution

SNU connected two Mellanox SX1012 40 Gigabit Ethernet switches to the Pivot3 hyperconverged platform, and conducted wide-ranging operational and performance testing. Through this setup, SNU was able to achieve their targeted levels of performance in terms of VM mobility, provisioning time, and overall system performance. Based on these results, the SNU IT team decided to replace their old 10 Gigabit Ethernet switches with Mellanox SX1012 40 Gigabit Ethernet switches.

SNU : Pivot3 and Mellanox 40Gb Ethernet Switch VDI Configuration Diagram
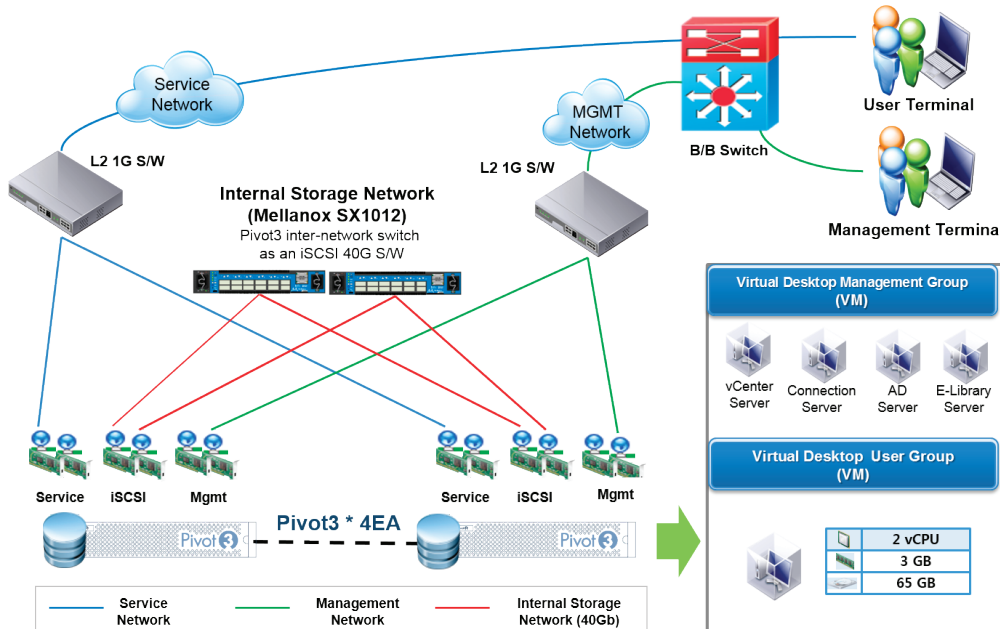
Solution Details

Seoul National University deployed 204 virtual desktops, each assigned to a unique user, on a Pivot3 hyperconverged platform that was upgraded with flash-based storage and Mellanox SX1012 40 Gigabit Ethernet switches.

The compute/storage components for SNU's Pivot3 platform were built using four x86 servers with Intel Xeon E5 processors and flash storage, for a total capacity of:

- 26 server cores – 2 Intel Xeon E5-2650 CPUs (2.6GHz) and 2 Intel Xeon E5-2630 CPUs (2.3GHz)

- 768GB of RAM

- 12TB of HDDs

The VDI software components included VMware's ESXi version 5.5.0 as the hypervisor, VMware's View-Client 3.2.0 as the VDI-Client, and VMware's Horizon View version 6.0.0 for VDI management.

A Pivot3 platform employs two network fabrics: a front-end network and a back-end network. The front-end network traditionally connects to a client's existing data center network via the Gigabit Ethernet ports on the array servers. SNU connected their 1G connections to two different 1G switches, the first for the management network and the second for the service network.

The high speed back-end network is for the internal real-time distribution of the file system across the compute nodes. This back-end network is traditionally built with a pair of 10 Gigabit Ethernet switches. However, when SNU deployed their Pivot3 platform with flash-based drives, they increased the performance capabilities of their Pivot3 platform beyond what the 10 Gigabit Ethernet switches could reliably deliver. To remove this bottleneck, SNU IT upgraded the Pivot3 back-end network to 40 Gigabit Ethernet by deploying two Mellanox SX1012 switches, which allowed the array to perform to its maximum level.

Key Features/Benefits of Pivot3's Hyperconverged Solution

- Performance – 2-3X the performance of replication-based 'local' HCI platforms with extremely low compute overhead

- Resiliency – Extreme availability and high fault tolerance to prevent the loss of data in the event of a drive or node failure

- Efficiency – The most efficient data protection platform in the industry with maximum usable storage capacity for significant cost savings

- Simplicity – Effortless, single-source-of-truth management capabilities that are self-optimizing, self-monitoring, and self-healing

Key Features/Benefits of the Mellanox SX1012 40 Gigabit Ethernet Switch

- Twelve 40 Gigabit Ethernet ports that can be used for up to forty-eight 10 Gigabit ports

- Zero packet loss – line-rate performance at all packet sizes with all port combinations

- Ultra-low 220ns latency makes it ideal for iSCSI workloads

- Half-width form factor, by which 2 switches sit side-by-side in 1 rack unit

- Optimized for tight spaces – like partial rack co-location deployments

- Redundant power supply – standard

- Best-in-class power consumption of just 55 watts (typical)

- Easy-to-use graphical user interface and familiar command line interface

- 40% faster (56Gbps) link speed when connecting to other Mellanox devices

Conclusion

When modern hyperconverged architectures, like Pivot3's hyperconverged infrastructure, are deployed with flash-based storage, they require equally modern network connectivity. Seoul National University built a cutting-edge VDI solution that pushed beyond the boundaries of 10 Gigabit Ethernet performance. Their solution to this problem was to upgrade the fabric of their hyperconverged solution with Mellanox SX1012 40 Gigabit Ethernet switches, thereby improving the overall performance of their virtualized infrastructure deployment.

Mellanox
TECHNOLOGIES

350 Oakmead Parkway, Suite 100, Sunnyvale, CA 94085
Tel: 408-970-3400 • Fax: 408-970-3403
www.mellanox.com