

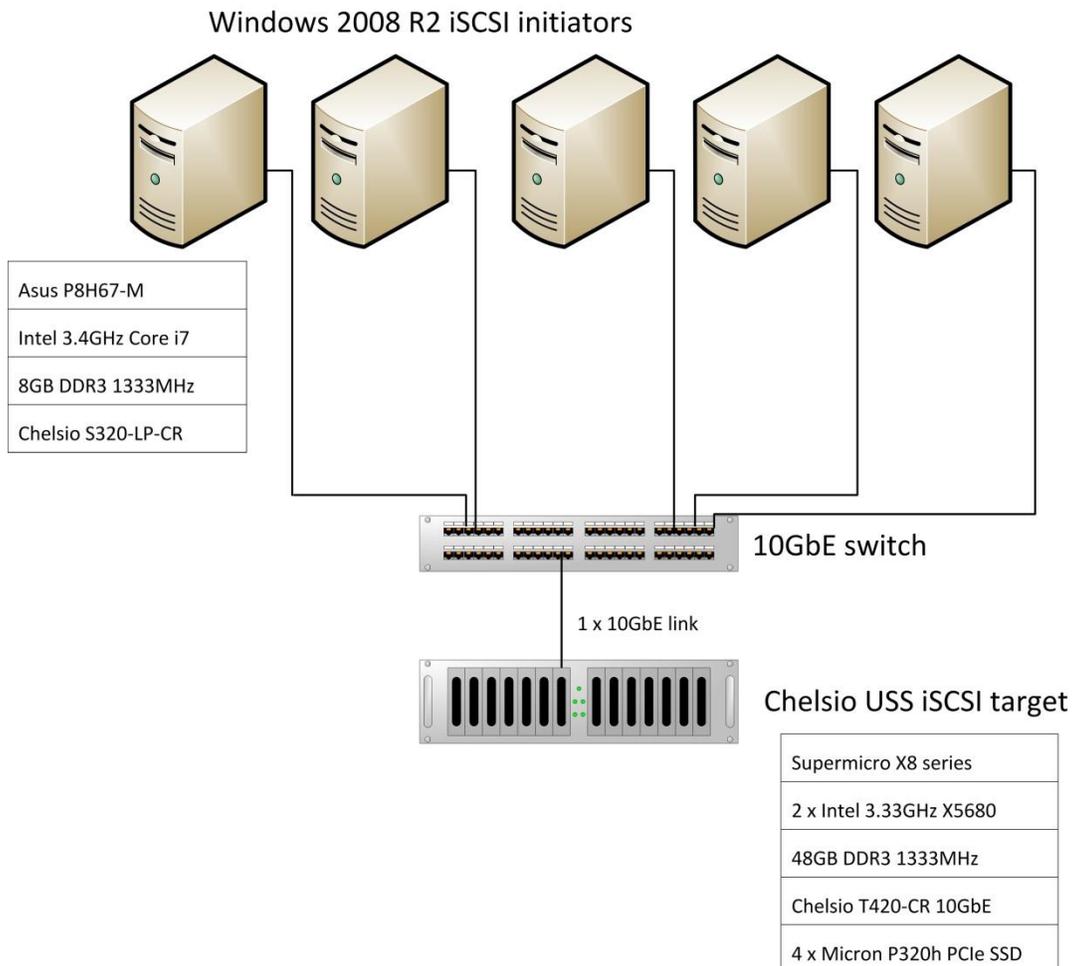


Delivering More Than One Million IOPS – Building a Storage Target Solution Using Off-The-Shelf Components

Chelsio Unified Storage Server

Chelsio Unified Storage Server (USS) software is a powerful, easy-to-use turnkey solution for creating high performance file and block storage solutions. This document shows how USS can be combined with off-the-shelf components to create an iSCSI storage target with performance that exceeds one million IOPS.

The Topology



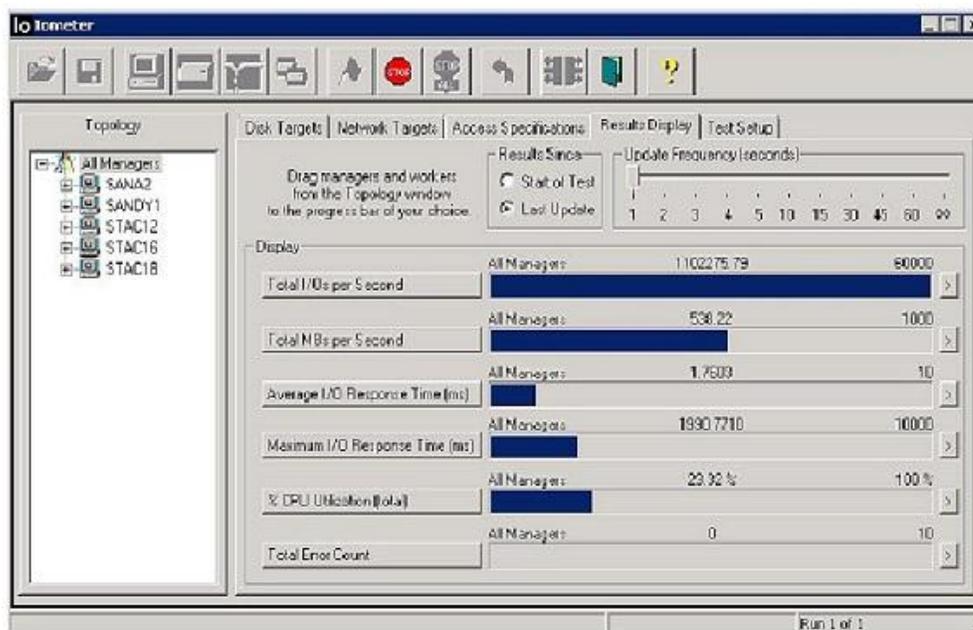
Network configuration: Five iSCSI initiator systems are connected to the 10GbE switch via port 0 of a Chelsio S320-LP-CR 10GbE adapter on each system with Twinax cables. The USS iSCSI target system is connected to the 10GbE switch via port 0 of a Chelsio T420-CR 10GbE adapter.

Software configuration: The setup for this performance benchmark uses five systems with Windows Server 2008 R2 with service pack 1 and all Windows updates installed. The iSCSI initiator used is the Microsoft iSCSI initiator included in the OS. The benchmarking tool used to generate the I/O load is IOmeter 2006.07.27 from www.iometer.org. The Chelsio network driver version used on the Windows initiators is 1.5.13.46. The USS software version used is build 2.1.0-406.

I/O benchmarking configuration: The I/O size used is 512 Bytes, and the I/O access pattern is sequential read. There are 12 IOmeter workers per iSCSI initiator system, and a queue of 32 commands, specified in IOmeter as outstanding I/O requests. The IOmeter management interface is run on one of the initiator systems, and the dynamo.exe load generating tool is run on the remaining 4 initiator systems.

USS iSCSI target configuration: Four Micron PCIe SSDs are divided into several partitions each. Each partition is exported as an iSCSI target. A traffic management tool provided with the Chelsio driver for the T420-CR is used to create the policy object file to map the iSCSI connections to CPU. A simple policy is used to allow iSCSI connections to be randomly distributed.

The USS iSCSI target is multi-processor optimized and its workload is automatically distributed on all available CPU cores.



About Chelsio Communications

Chelsio is a leading technology company focused on providing high performance networking and storage solutions for virtualized enterprise data centers, cloud service installations, and cluster computing environments. Now shipping its fourth generation protocol acceleration technology, Chelsio is delivering hardware and software solutions including Unified Wire Ethernet network adapter cards, Unified Storage Server software, high performance storage gateways, unified management software, bypass cards, and other solutions focused on specialized