100G iSCSI Offload Performance for AMD EPYC

Using AMD EPYC 7551 Platform & Chelsio T6 Adapter

Executive Summary

AMD EPYC, industry's first hardware-embedded x86 server security solution, is a system on chip (SoC) which provides exceptional processing power coupled with high-end memory and I/O resources to meet workload demands of any scale, from virtualized infrastructures to cloud-era datacenters. The combination of the AMD EPYC 7551 server with Chelsio's industry-leading Unified Wire adapter solution delivers compelling performance, power and total cost of ownership (TCO) advantages. This enables innovative topologies and networked computing models to address the most demanding processing needs.

The demonstration shows Chelsio 100G iSCSI offload solution delivering 98 Gbps line-rate performance for a cost-effective enterprise-class storage target solution built with volume, off-the-shelf hardware and software components.

Test Results

The following graph presents READ, WRITE IOPS and throughput performance of Chelsio T6 iSCSI solution using Ramdisk (nullio) device as storage array. The results are collected using the **fio** tool with I/O size varying from 4k to 512k bytes with an access pattern of random READs and WRITEs.

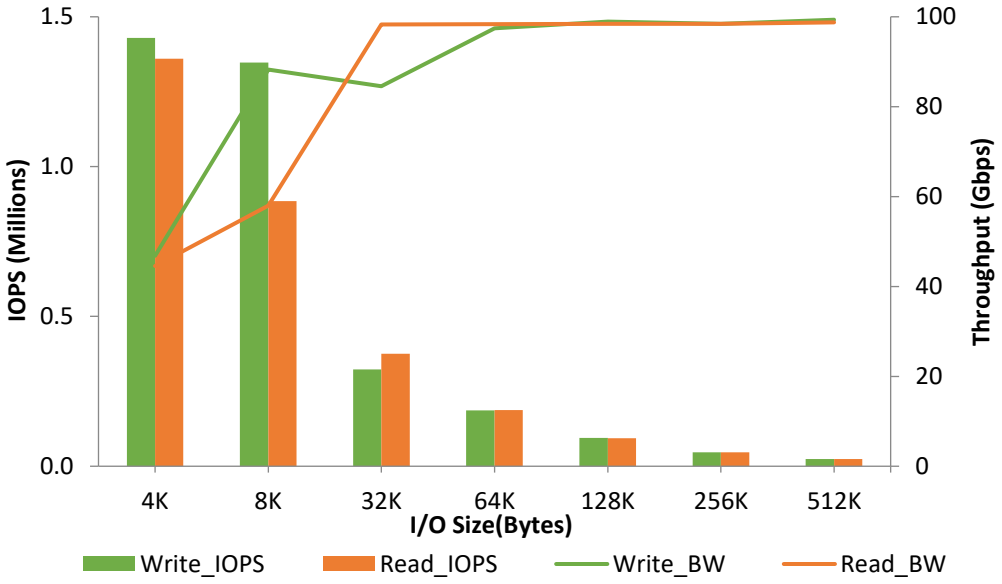

Figure 1 – READ, WRITE Throughput & IOPS vs. I/O size

As seen from the above results, T6 iSCSI solution delivers an exceptional line-rate throughput performance of 98 Gbps for both READ and WRITE. In addition, the solution scores a commendable IOPS performance of ~1.5M.

The Demonstration

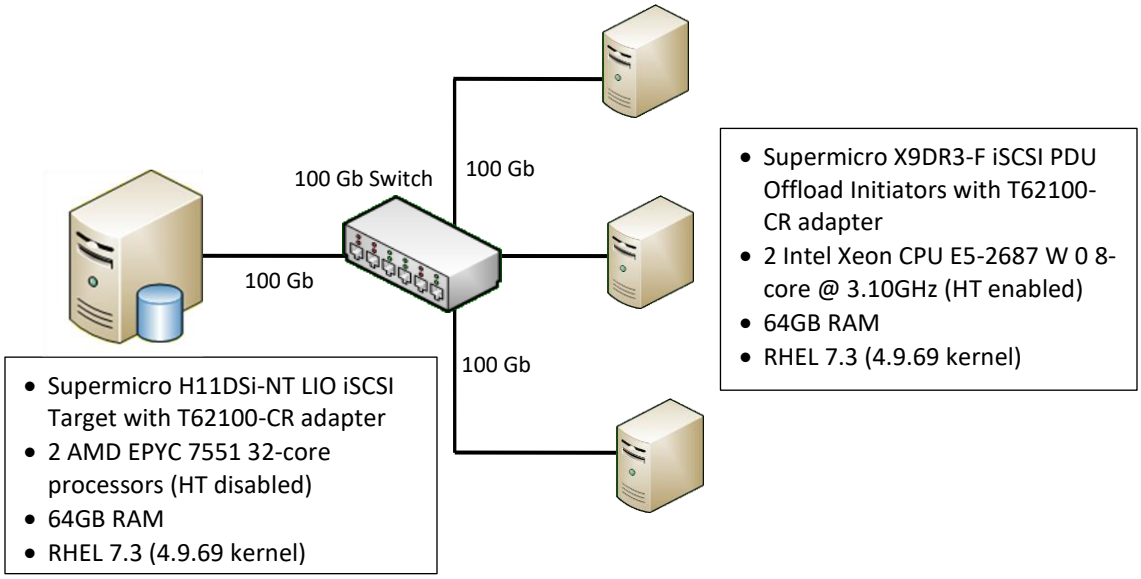

Figure 2 – Test Setup

The setup consists of an iSCSI target machine connected to 3 initiator machines through a 100GbE switch using single port on each system. MTU of 9000B is used. Latest Chelsio Unified Wire driver is installed on each machine. The target is configured with 24 Ramdisk (nullio) LUNs, each of 600MB size. Each initiator uses 8 connections.

Command used

WRITE/READ:

```
[root@host~]# fio --rw=randwrite/randread --ioengine=libaio --name=random --size=400m --invalidate=1 --direct=1 --runtime=30 --time_based --fsync_on_close=1 --group_reporting --filename=/dev/sdb:...:/dev/sdi --iodepth=10 --numjobs=2 --bs=<value>
```

Conclusion

This paper provided 100GbE iSCSI IOPS and Throughput performance results for Chelsio's 100GbE T62100-CR Unified Wire adapter in AMD EPYC 7551 based servers. The adapter performs consistently under load and delivers line-rate performance. Chelsio T6's iSCSI solution provides an all-round SAN solution for exceptional I/O performance and efficiency. The results show that Chelsio's iSCSI solution delivers:

- Line-rate throughput of 98 Gbps for both READ and WRITE
- IOPS of ~1.5M

Related Links

100G iSCSI Offload Performance
Demartek Evaluation: Chelsio Terminator 6 (T6) Unified Wire Adapter iSCSI Offload
Industry's First 100G iSCSI Offload for Arm
High performance 100G iSCSI Storage Solution
High Performance iSCSI at 100GbE