# Secure Data Replication at 25GbE

## Chelsio T6 iWARP RDMA Solution for Microsoft Storage Replica

## Executive Summary

**Storage Replica** (SR) is a Windows Server 2016 feature which enables block-level replication between clusters or individual servers for disaster recovery, and stretching of failover clusters to metropolitan (MAN) and wide area (WAN, US coast-to-coast) distances for high-availability. The paper provides a performance comparison of Chelsio's T6225-CR RDMA-enabled adapter and Intel's X710-DA2 server adapter. The results clearly show that T6225-CR provides higher throughput and lower latency across the board. Chelsio iWARP RDMA is uniquely capable of sustaining SR's unique load pattern to provide zero data loss and high-availability during catastrophic disasters across short and long distances.

## Test Results

The following graphs compare the WRITE throughput, % CPU and Latency results for the two adapters. DISKSPD Tool (v2.0.17a) is used with the I/O sizes varying from 512 to 512K bytes.
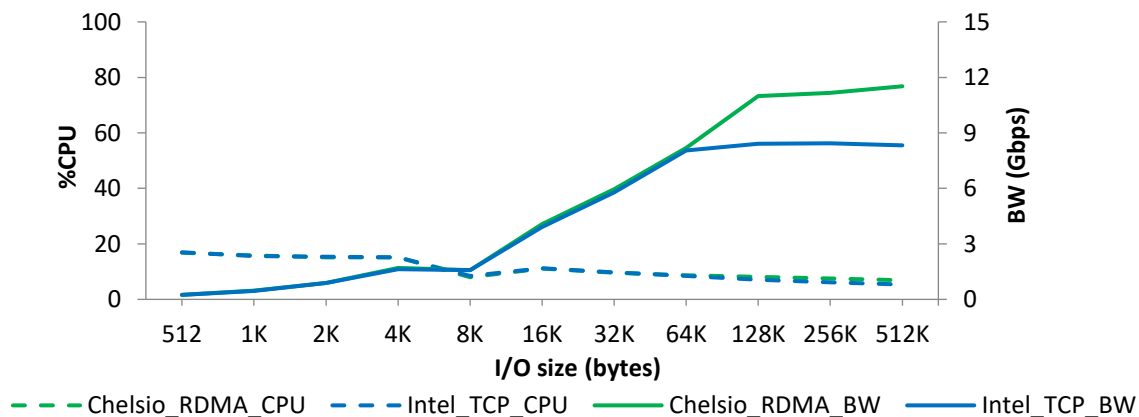


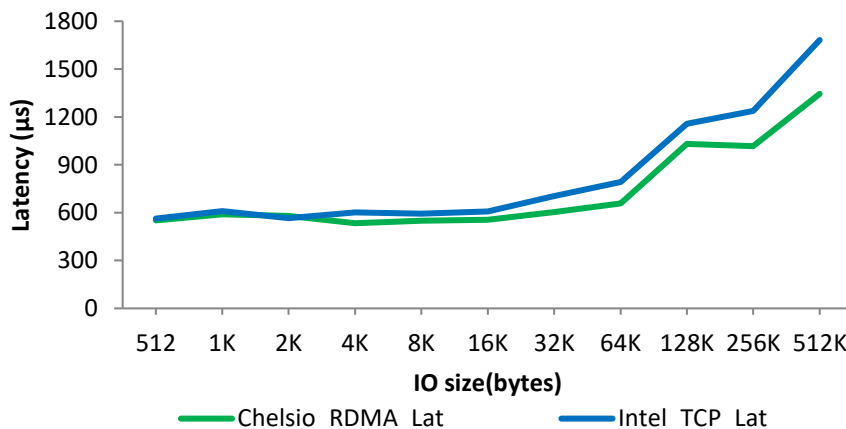**Figure 1 – Throughput and CPU% vs. I/O size**



**Figure 2 – Latency vs. I/O size**

The above results reveal that Chelsio's RDMA-enabled adapter delivers up to 36% higher bandwidth than Intel server adapter. This higher bandwidth is achieved with similar CPU utilization, indicative of an efficient processing path. With a maximum of 17% CPU utilization, considerable processing power is available for other applications. Chelsio T6225-CR also provides up to 300µs lower latency that Intel adapter.

## Test Configuration

The test configuration consists of a Server connected to a Client with a single port. Standard MTU of 1500B is configured. The Server consists of 4 Intel NVMe PCIe DC P3600 Series 1.6TB SSDs and Client consists of 4 Micron 9100 PCIe NVMe 2.4TB SSDs.
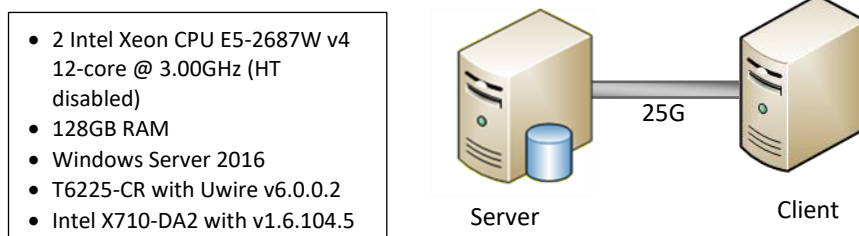


- 2 Intel Xeon CPU E5-2687W v4 12-core @ 3.00GHz (HT disabled)
- 128GB RAM
- Windows Server 2016
- T6225-CR with Uwire v6.0.0.2
- Intel X710-DA2 with v1.6.104.5

Server          25G          Client

**Figure 3 - Test Setup**

**Command used**
```
PS C:\Users\Administrator> diskspd.exe -b<IO_SIZE> -w100 -r -o32 -W5 -C5 -d30 -
t24 -L -Sh Y:\testfile1.dat
```

## Summary

This paper presented SR performance with Chelsio T6225-CR RDMA adapter and compared it with Intel Server adapter. The T6 adapter outperforms Intel in both throughput and latency, indicating that significant performance and efficiency benefits are obtained when Chelsio's RDMA solution is in use. Microsoft's Storage Replica with T6 provides datacenters high performance data replication over local and remote locations with minimal data loss and ease of use. Enterprises and data centers searching for a cost-effective and secure data recovery solution need not look beyond Chelsio T6 iWARP RDMA solution.

## Related Links

**iWARP RDMA – Here and Now**
**Windows SMB 3.1.1 Performance at 100Gbps**
**High Performance Storage Replica at 40GbE**
**High Performance Disaster Recovery at 40GbE**
**Storage Replica with RDMA and 25km Fiber in Windows Server 2016 Technical Preview 2**