

100G Network Performance for Illumos

Line Rate Throughput with Chelsio T6 Adapter

Executive Summary

Chelsio adapters provide extensive support for stateless offload operation for both IPv4 and IPv6 (IP, TCP and UDP checksum offload, Large Send Offload, Larger Receive Offload, Receive Side Steering/Load Balancing, and flexible line rate Filtering). Designed for industry-leading performance, efficiency, and with the unique ability to fully offload TCP/IP, iSCSI and iWARP protocols using a single ASIC and firmware, Chelsio adapters unburden communication responsibilities and processing overhead from servers and storage systems by enabling a true converged Unified Wire solution resulting in a dramatic increase in application performance with a minimum of CPU cycles. This paper shows Chelsio 100G Network adapter T62100-CR running with stateless offload only, delivering line-rate 99 Gbps throughput in an Illumos environment. Thanks to an inbox driver in the Illumos kernel, T6-based adapters are plug-and-play solutions for extreme networking performance. Future software releases can enable the various offload capabilities in the silicon.

Test Results

The following graph plots the uni-directional performance results varying the number of connections. The results are obtained using the Iperf tool across I/O sizes ranging from 64 bytes to 512 Kbytes.

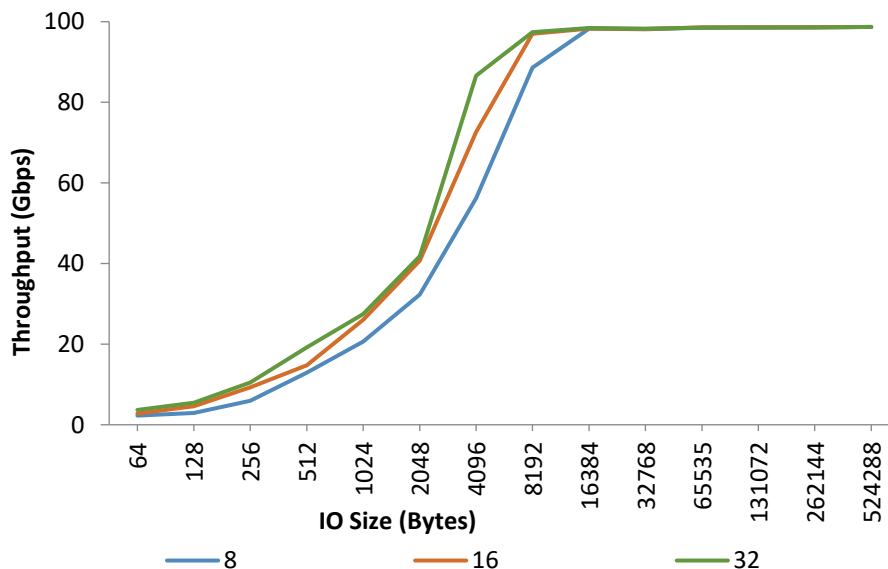


Figure 1 – Throughput vs. I/O size

Chelsio adapter delivers consistent performance across the range of study, reaching line-rate throughput of 99 Gbps even with multiple connections.

Test Setup

The setup consists of 2 machines connected back-to-back using a single 100G port. MTU of 9000B was used. Chelsio adapters were configured with inbox drivers.

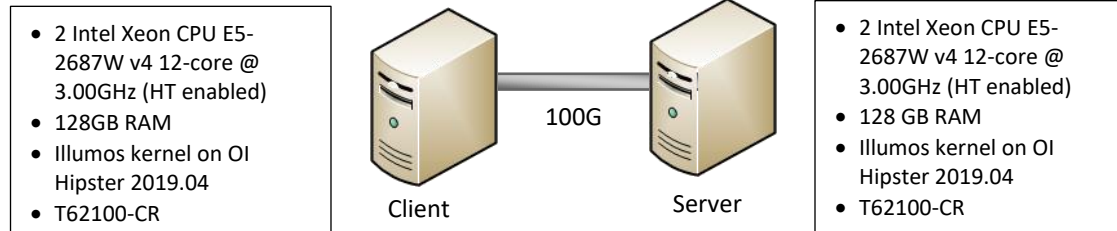


Figure 2 – Test Setup

Commands Used

On both the machines, the following option was added in `/etc/system` to increase the number of MSI-X vectors available to the Chelsio adapter. The machines were then rebooted to apply the change.

```
set ddi_msix_alloc_limit=32
```

Server: `iperf -s`

Client: `iperf -c <Server IP> -l <IO Size> -t 30 -P <# Conn>`

Conclusion

This paper provided the performance results for Chelsio 100G Network adapter running with stateless offload only in an Illumos server environment. With line-rate throughput of 99 Gbps, Chelsio Unified Wire Ethernet adapters provide the optimal and scalable networking building block for datacenters.

Related Links

[Solaris/OpenIndiana at 40Gbps](#)

[OpenIndiana 40Gbps TOE vs. NIC Performance](#)

[100G Network Performance for AMD EPYC](#)