Concurrent 100G Offload & Encryption on Arm

Using Qualcomm Centriq 2400 Arm Platform & Chelsio T6 Adapter

Executive Summary

This paper presents Chelsio T6 Inline-TLS/SSL performance on Qualcomm Centriq 2400 Arm Platform, showing line-rate bandwidth and minimal Server CPU usage. T6 delivers a consistent performance even with increasing number of connections while freeing up CPU resources. Hence, proving that Chelsio's T6 crypto solution is the best when it comes to delivering performance coupled with the highest data security.

Chelsio Unified Wire's leading-edge performance and efficiency for networking, storage, and security applications combined with the Qualcomm Centriq 2400, the world's first 10-nanometer server processor, offer a complete best-of-breed 64bit Arm-based infrastructure for cloud datacenters. The coupling of the Qualcomm Centriq 2400 processor based QDF2400 REP 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 cloud datacenter infrastructure needs.

Figure 1 - QDF2400 REP Server and T6 adapters

Test Results

The following graph presents the throughput and CPU usage using Chelsio T6 crypto accelerator in Inline-TLS/SSL mode. The numbers are collected using **openssl** tool with connections ranging from 8 to 10000.

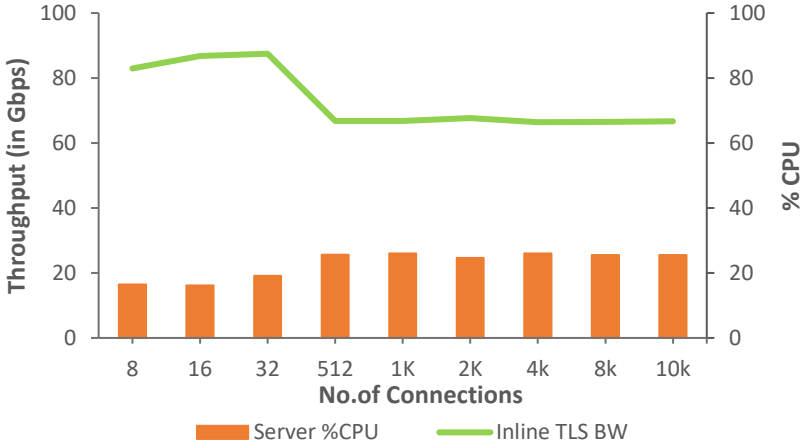

Figure 2 - Inline-TLS/SSL Throughput & CPU Usage vs. # Connections

The Chelsio Inline TLS/SSL solution delivers a maximum of 87 Gbps performance, while preserving the privacy and integrity of the data. Even with the increase in number of connections to 10000, the CPU usage on Server never exceeded 25%, indicative of an efficient processing path. The freed-up CPU can be used for application processing. *Data is preliminary and further performance tuning is in progress.*

Test Configuration

Topology

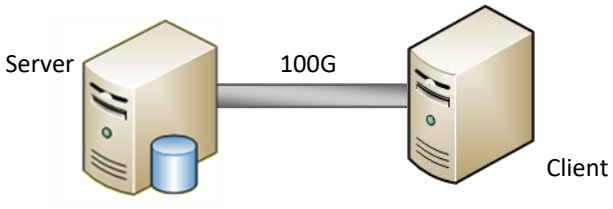

Figure 3 – Simple Back-to-Back Test Topology

The setup consists of a server connected to a client back-to-back using single 100G link. MTU of 9000B is configured. The server is a Qualcomm QDF2400 REP Server with 2 v1.1 24-core processors @ 2500MHz (HT disabled), 64GB RAM and RHEL 7.3 operating system (4.9.49 kernel). The Client is setup with 1 Intel Xeon CPU E5-1660 v2 6-core processor @ 3.70GHz (HT enabled), 128GB RAM and RHEL 7.3 operating system (4.9.49 kernel). Chelsio T62100-CR adapter is installed in each system and configured with latest Chelsio Unified Wire drivers.

Commands Used

Server

```
[root@host~]# openssl s_server -key <path_to_key> -cert <patch_to_cert> -accept
<port_num> -cipher AES128-GCM-SHA256  -WWW
```

Client

```
[root@host~]# openssl s_time -connect <IP>:<port_num>  -www /1.5G  -time 100
```

Conclusion

This paper presented performance of Chelsio's T6 Inline-TLS/SSL acceleration solution in Qualcomm Arm based servers. With line-rate performance and CPU savings even with 10000 connections, Chelsio's solutions proves to be the best choice for clients looking for highest level of data security and integrity, without compromising performance. T6 is currently the only secure engine capable of full TCP/IP Offload at 100Gbps. The introduction of integrated encryption within a NIC price and power envelope should further the migration towards secure cloud networks and storage.

Related Links

Concurrent Offload & Encryption at 100GbE
Chelsio Terminator 6 ASIC 100GE Crypto Offload
The Chelsio Terminator 6 ASIC