

# LDA LIGHTSPEED TCP™

*An FPGA-based TCP Offload IP Core*

LDA Technologies in partnership with Solarflare introduce LDA Lightspeed TCP™\*: an ultra light, ultra high-speed and ultra low-latency FPGA-based distributed TCP offload that overthrows currently available TOEs by allowing its users to:

- Achieve unprecedented low processing latencies of under 20ns
- Have thousands of TCP connections with only fractional FPGA utilization increase
- Choose FPGA platform without limits across various technologies

LDA Lightspeed TCP™ is FPGA vendor/FPGA board agnostic IP Core which while running on multiple FPGA boards requires only one Onload™-enabled Solarflare network adapter to manage them and maintain TCP connections thus introducing a distributed solution to the list of available TCP Offload Engines.

LDA Lightspeed TCP™ includes both TCP Transmit and TCP Receive IP Cores which can be used independently.

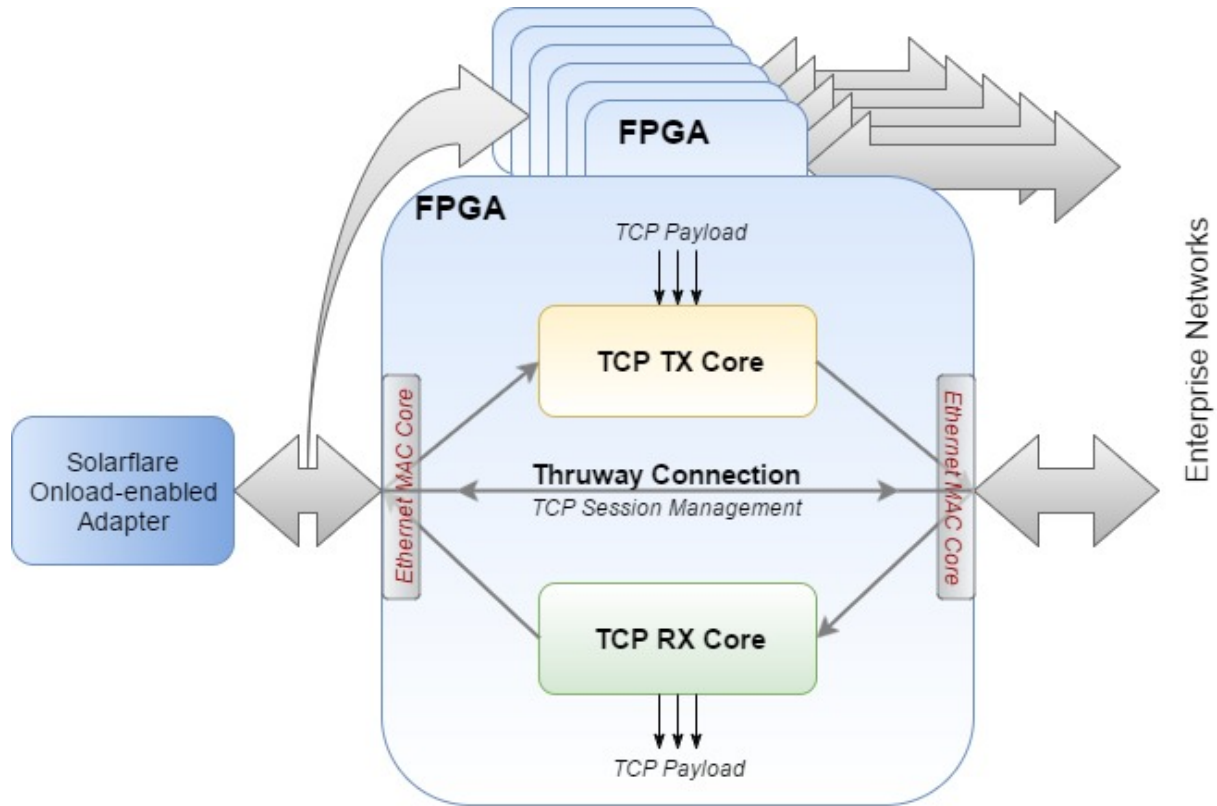
## UNIQUE FEATURES

Ultra Low Latency	<i>Less than 20ns with the 323MHz clock: - Six (6) clocks on TX - Five (5) clocks on RX</i>
FPGA/ FPGA board agnostic	<i>Tested on Altera and Xilinx architectures</i>
Very Low FPGA resource utilization	<i>for 16 TCP Connections: - TX only: 34 BRAM, 1730 CLB LUT's - RX only: 27 BRAM, 1776 CLB LUT's - TX + RX: 44 BRAM, 2704 CLB LUT's</i>
No memory requirement	<i>No need for QDR or DDR</i>
No FPGA-side configuration	<i>IP Cores configuration by TCP Agent library via network</i>
Simple Streaming Data Interface	<i>AXIS</i>
Single Clock domain with 10G Ethernet MAC	<i>Fmax &gt; 340 Mhz with Xilinx Ultrascale FPGA</i>
Continuous transmission support	<i>Based on window size monitoring</i>
Window Scaling and MSS options support	<i>Additional TCP options supported upon request</i>
Very Low-cost	<i>Pricing per connections block per FPGA chip</i>

## ARCHITECTURE

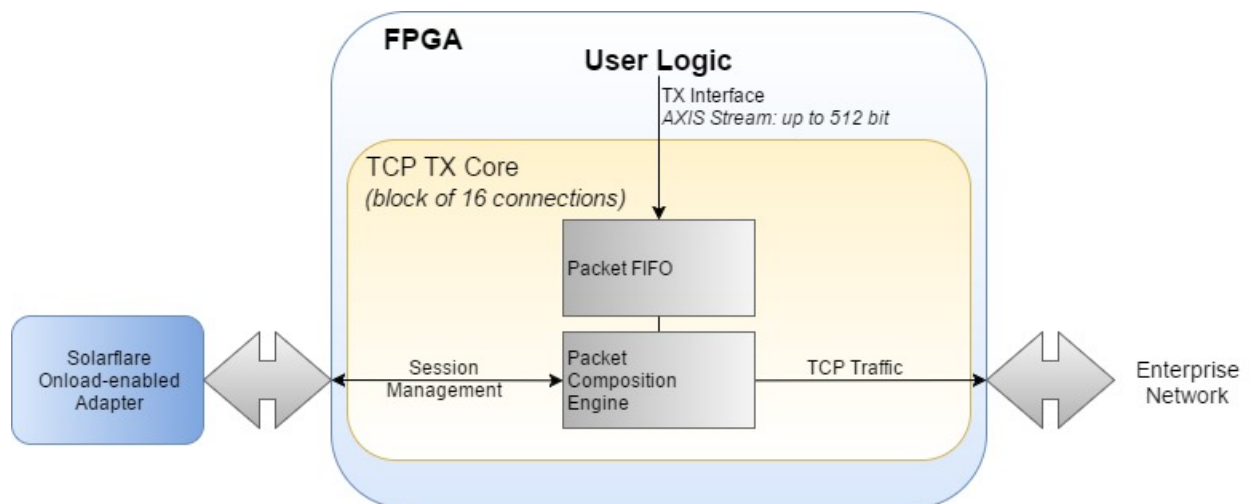
LDA Lightspeed TCP™ framework consists of an LDA TCP Agent library running on a server with a Solarflare Onload™-enabled adapter and an FPGA-based offload IP cores. LDA TCP Agent library manages TCP sessions while LDA TCP Offload IP Cores leverage FPGA capabilities for ultra-fast packet delivery.

Only one TCP Agent is required to manage multiple LDA Lightspeed TCP™ IP Core instances running on multiple FPGA boards as well as maintain their TCP connections.

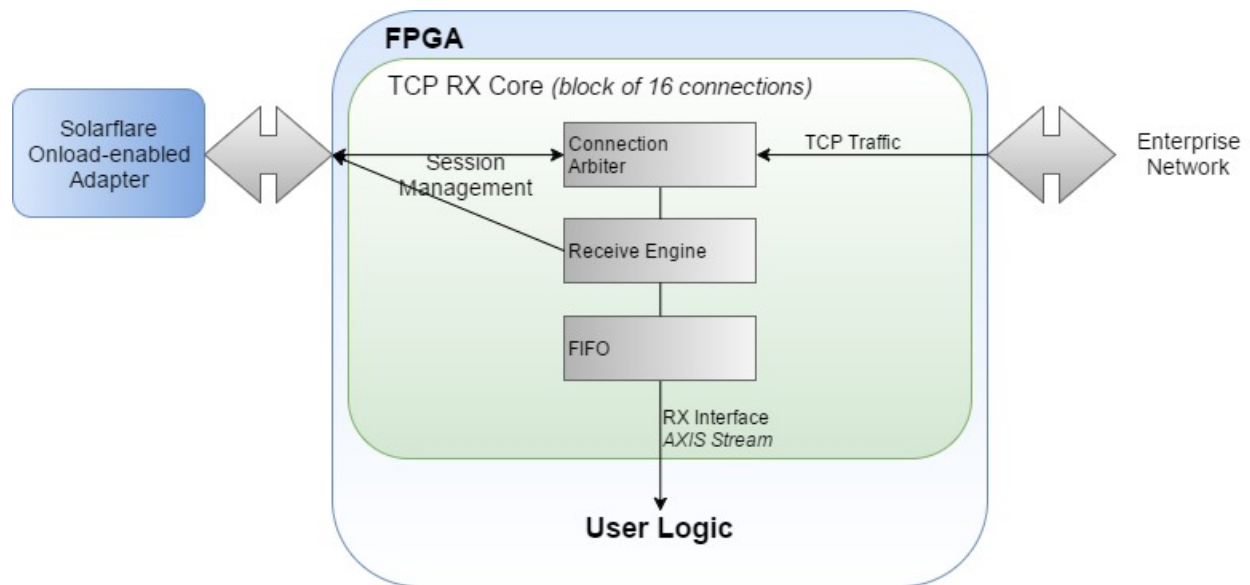


LDA TCP Offload comprises two independent IP cores: LDA TCP TX (Transmit core) and LDA TCP RX (Receive core). Both Transmit and Receive cores reach an ultra low-latency processing (TX adds only six clocks, RX only five) and have a very small logic footprint.

### TCP SEND



## TCP RECEIVE



## DELIVERABLES

- Compiled Partition or Obfuscated Source Code
- Verilog Test Bench (ModelSim)
- TCP Agent software API

## ORDER INFORMATION

[sales@ldatech.com](mailto:sales@ldatech.com)

---

\* This product contains technology proprietary to LDA Technologies, together with patented technology (US patents: 9003053, 9600429, 9258390, 9456060) from Solarflare.