Advanced FPGA technologies in trading: latest products from LDA

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LDA TECHNOLOGIES™

LDA Lightspeed TCP

A TCP OFFLOAD ENGINE OFFERED IN PARTNERSHIP WITH SOLARFLARE®

- 6 CLOCKS ON TX
- 5 CLOCKS ON RX
- SMALL RESOURCE FOOTPRINT

TICK-TO-TRADE ACTIONABLE I/O LATENCY CAN GO AS LOW AS

82 NANOSECONDS (INCLUDING LDA MAC/PCS)

ACCORDING TO STAC-T0™ BENCHMARK, SUT ID SFC170831

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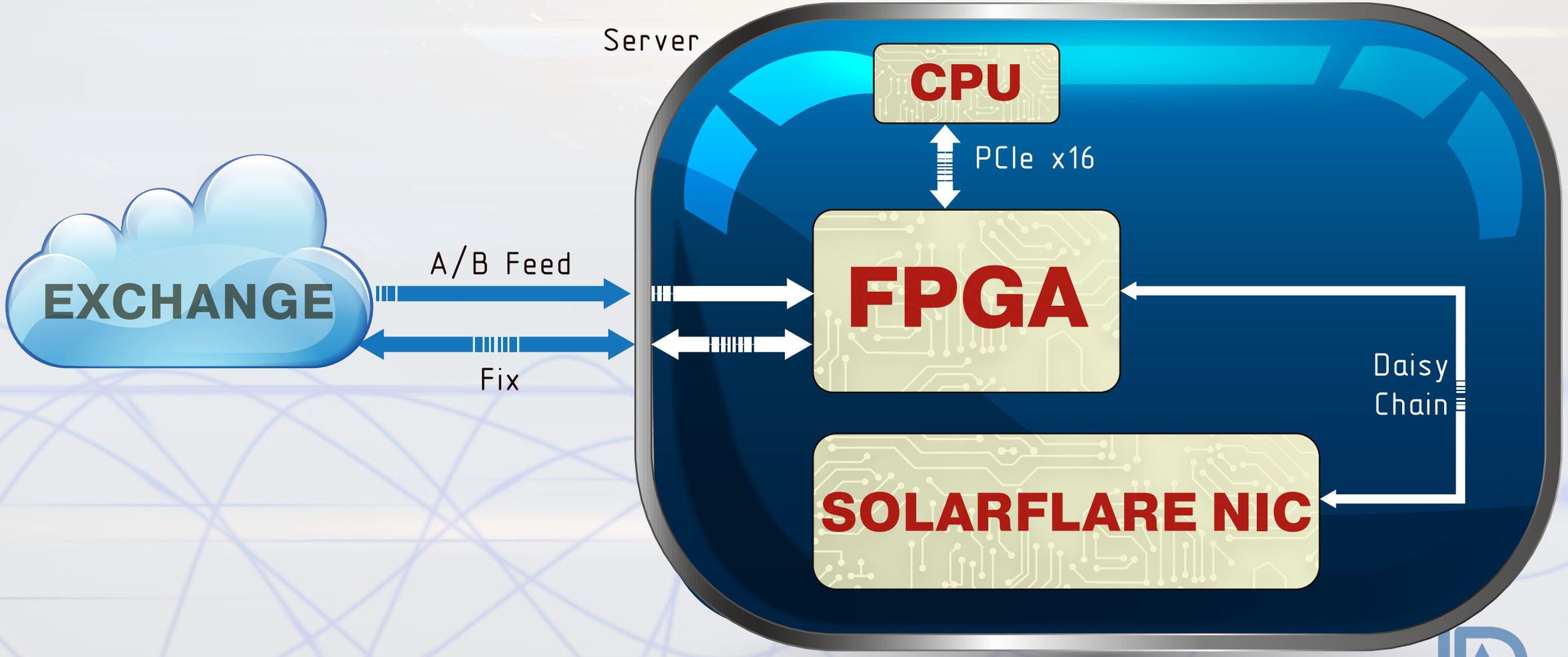
CME Tick-To-Trade Solution



CME Tick-To-Trade Solution

includes:

- **ULTRA-LOW LATENCY CME MDP3 FEED HANDLER WITH A/B LINE ARBITRATION**
- **FIX PROTOCOL ACCELERATION IN FPGA**
  - Additional performance boost due to PCIe x16 and batching support
- **AUTOMATED TRADING SUPPORT IN FPGA, FEATURING:**
  - Complex Order Triggering conditions
  - Actionable tick-to-trade latency: **120* – 300*ns**

**Not STAC Benchmarks*

ULTRA-LOW LATENCY SOLUTIONS ON MPSOC-BASED FPGA BOARDS

LDA'S ULTRA-LOW LATENCY IP CORES RUN ON XILINX MPSOC-BASED FPGA BOARDS FROM LDA PARTNERS

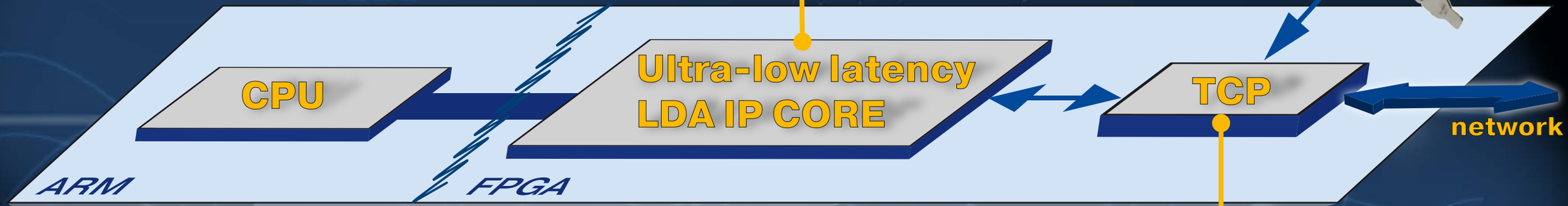
GENERIC RISK CHECK FRAMEWORK

- API allowing users to easily implement proprietary risk check algorithms
- Base latency introduced: **180ns**
- Wire-to-wire latency: **300*– 400*ns** on most stock market binary protocols with moderately complex risk computation algorithms

can also host:

CME TICK-TO-TRADE SOLUTION

SOLARFLARE NIC



LDA LIGHTSPEED TCP

An ultra-light, ultra-high-speed, and ultra-low-latency FPGA-based distributed TCP offload engine with processing latencies under **20*ns** and thousands of TCP connections

*Not STAC Benchmarks

SOLARFLARE®

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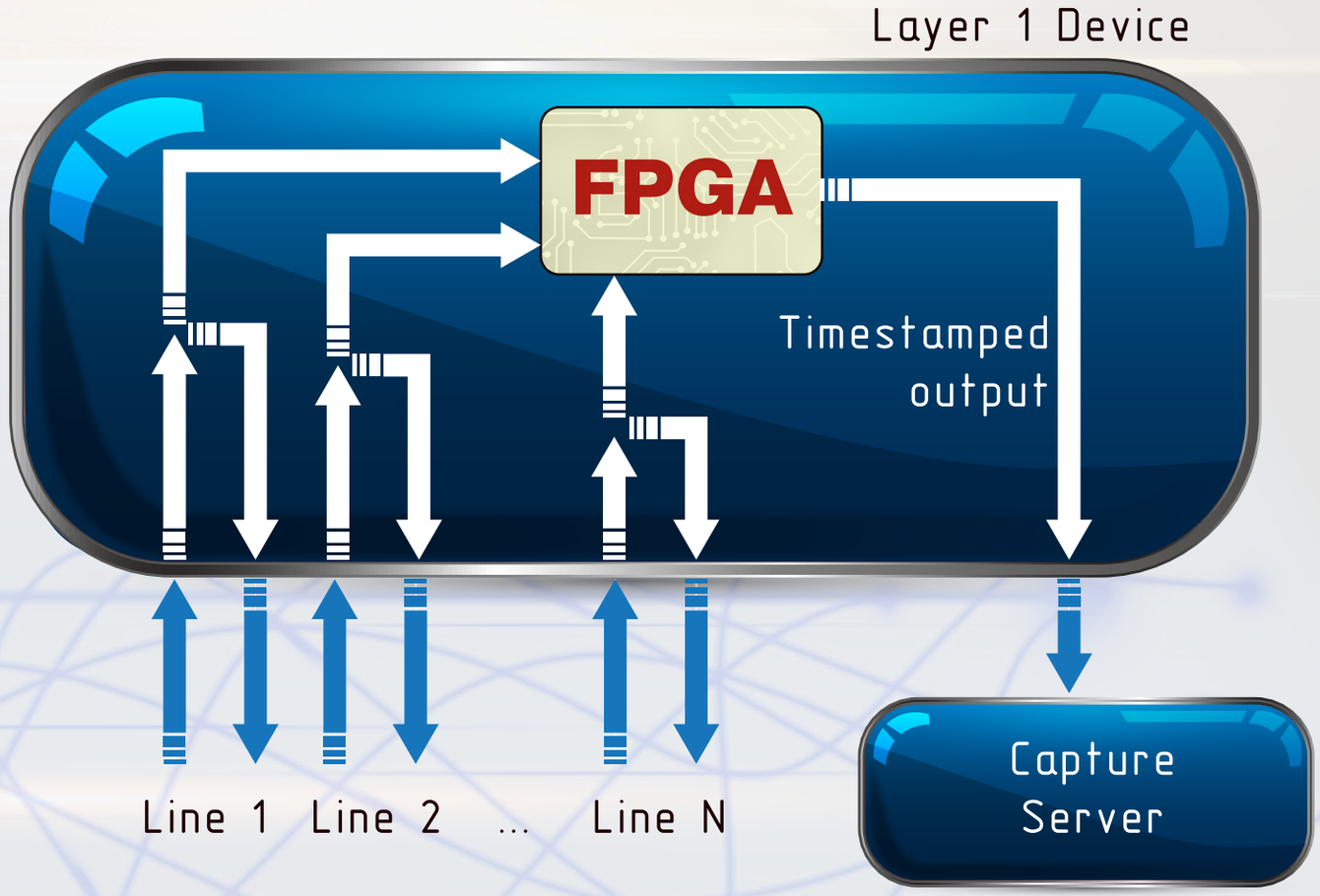
Use case: Timestamping

MULTIPLE LINES NEED
TO BE TIMESTAMPED
AND FORWARDED VIA LAYER 1
FOR LOWEST LATENCY

- DEDICATED DEVICE(S)
  FOR LAYER 1
  AND TAP AGGREGATION
- AT LEAST 2U SPACE:
  DEVICE + CAPTURE SERVER



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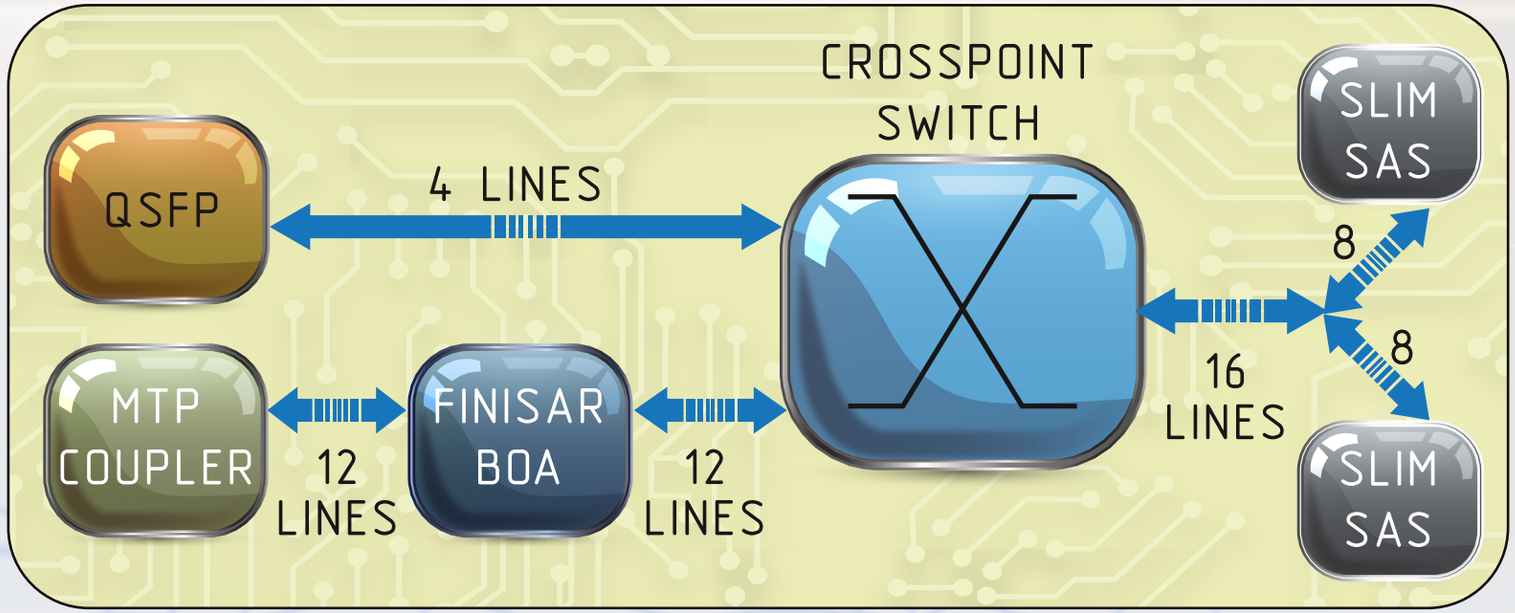
LDA d6 add-on

D6 ADD-ON IS A LOW-PROFILE BOARD THAT FITS INTO MOST 1U SERVERS SUPPLYING:

- 8 OR 16 PORTS
- SIMPLE LAYER 1 MESH:
  - 8x8 or 16x16 L1 fabric with **1*ns** latency
- ABILITY TO CONNECT UP TO 16 LINKS TO FPGA BOARD OF YOUR CHOICE
  - Currently supported boards include Xilinx Ultrascale+ boards from Alpha Data and Bittware



d6 Add-on

*Not STAC Benchmark

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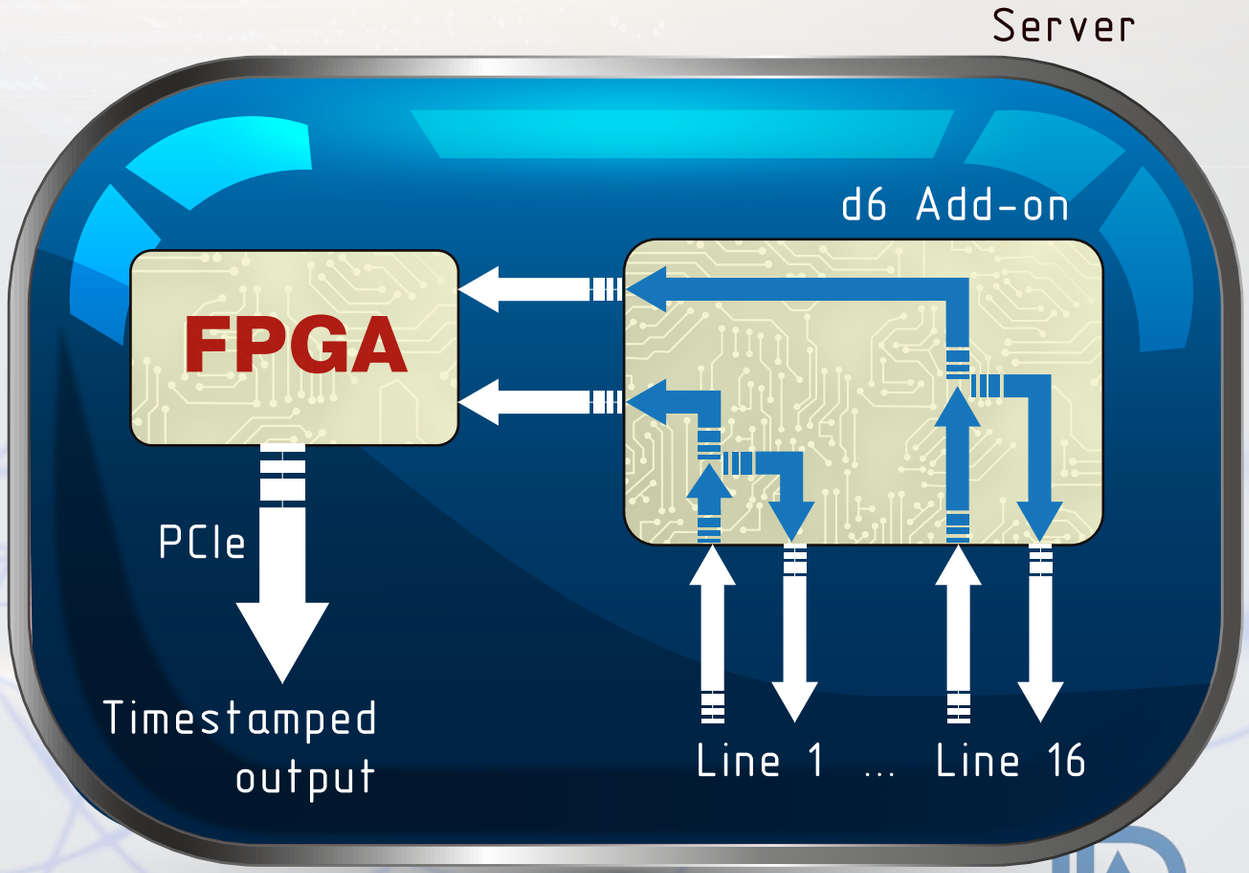
LDA Timestamping in 1U general purpose server

- UP TO 16 PORTS FORWARDED AND TIMESTAMPED
- TIMESTAMPED TRAFFIC IS CAPTURED ON THE SERVER: NO BROADCASTS
- BANDWIDTH LIMITED ONLY BY SERVER CPU AND STORAGE SPEED
- CAPABILITY TO GENERATE SEPARATE FILES PER PORT AND TIME SLICE
- **SUB-NANOSECOND*** TIMESTAMPING ACCURACY



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D6 ADD-ON CAN HOST OTHER LDA PRODUCTS, SUCH AS:

- **LDA NEOMUX:** LDA'S **39*NS WIRE-TO-WIRE** MUX
- **LDA NEOBAND:** ULTRA-LOW LATENCY BANDWIDTH MANAGEMENT SYSTEM

**Not STAC Benchmark*

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Thank you
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