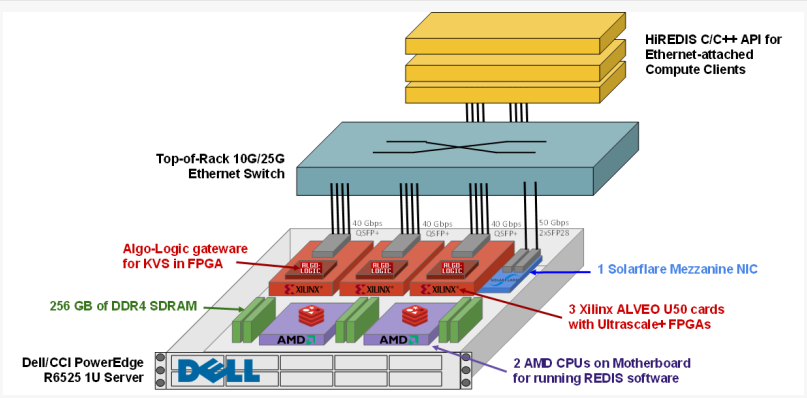
Algo-Logic Systems Demonstrates Half-Billion IOPs in a 1U Redis server with FPGA Acceleration at RedisConf 2020

Algo-Logic Systems, Xilinx, Dell, and CCIntegration team up to deliver 490M IOPs with Key Value Store in a 1U Dell Server



FPGA Accelerated REDIS System - Half Billion IOPs

SAN JOSE, CALIFORNIA, USA, May 12, 2020 /EINPresswire.com/ -- Algo-Logic Systems, Inc., a recognized leader of Gateware Defined Networking (GDN) accelerated applications, products, and solutions has teamed with Dell, Xilinx, and CCIntegration to demonstrate the capability to deliver a Half-Billion IOPs in a 1U server at the RedisConf 2020 today.

Field Programmable Gate Arrays (FPGAs) are drastically increasing the speed of database servers. By implementing a Key-Value Store (KVS) entirely in FPGA logic, servers can offload time-critical queries from the CPU. In this work, we describe the architecture of a 1U server that uses an AMD CPU to implement a full REDIS database coupled with three Xilinx® FPGA-based Alveo™ U50 accelerator cards that offload 450M GET or SET Input/Output operations per second (IOPs).

The 1U rack-mount server has 170 Gigabits/Second of network bandwidth implemented using three QSFP+ 40G Ethernet ports and two 25G SFP28 ports. The two SFP28 ports are used to interface with REDIS on the host CPU via a Solarflare, now part of Xilinx, XtremeScale X2552 10/25GbE NIC with Onload® kernel bypass, while the other three QSFP+ ports handle queries directly in FPGA logic. The Hiredis C client was modified so that queries for small, fast-moving values are sent to the FPGA instead of the CPU. Queries serviced by the FPGA card respond with a network latency of under 500 nanoseconds.

Algo-Logic's new Key Value Store (KVS) powered by the Xilinx UltraScale+ architecture provides in-memory object store with the record-breaking latency and throughput performance to enable sensor fusion, real-time analytics and scale out machine learning. Implemented on the new Xilinx Alveo U50 accelerator card, the KVS merges live data from multiple sources, shares data with algorithms that perform inference and scale-out machine learning, and sources data for actuators and live visualization. Xilinx Alveo U50 accelerator cards with the Algo-Logic KVS can be installed in a standard PCIe slot, deployed in data centers, and/or accessed over the AlgoCentral cloud as a service.

Key Benefits of FPGA Accelerated Redis System:

- Unmatched Latency
  - Sub-microsecond latency for FPGA Acceleration
- Ultra-High Throughput
  - Total 490M IOPs for system
- Reduced Power Consumption and Data Center Rack Space
  - Single 1U Server (1.75" tall by 19" wide) instead of a rack of servers

“We are excited to demonstrate Algo-Logic’s newest products providing an end-to-end storage solution designed to support Cloud as well as high frequency financial trading applications,” said John Lockwood CEO of Algo-Logic Systems.
“It is exciting to team with Algo-Logic on in-memory storage using the Xilinx Alveo accelerator platform and deploy it into the cloud,” said Donna Yasay, Vice President of Marketing, Data Center Group, at Xilinx. “Algo-Logic’s Key-Value Store implemented on the Xilinx Alveo U50 card provides industry-leading real-time data access for multiple customer use cases from financial services to Web2.0 applications.”
RedisConf 2020
Join Algo-Logic Systems’ CEO John Lockwood as he presents “Achieving a Half-Billion IOPs in a 1U REDIS server with FPGA Acceleration” at RedisConf on May 12. To participate, please visit https://events.redislabs.com/redisconf20/agenda/
About Algo-Logic Systems:
Algo-Logic Systems Inc., is a recognized leader of Gateware Defined Networking® (GDN) products and solutions. More information about Algo-Logic is available at https://Algo-Logic.com/kvs For additional updates, follow Algo-Logic on Twitter at @Algo_Logic_Inc.

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