Axonerve™

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Ethernet Key-Value-Store by Axonerve

Xilinx Alveo™ powers low latency & Huge depth KVS

INTRODUCTION

Key Value Store (KVS) is a valid technique in systems such as telecommunications directories, IP transfer tables, and deduplication storage systems. In this time, we present an example of Accelerated KVS system by Alveo™ U50 with a lookup engine called ”Axonerve”.
Axonerve is a high-speed packet lookup engine developed for large-scale networks and can be provided as such a high-performance KVS table in the system. It allows hundreds or thousands of machines to easily share data and allows client machines to read and write keys and values over standard high-speed Ethernet.
"Axonerve" engine is an FPGA-dedicated IP developed as an algorithmic engine that provides ultra-low latency and high throughput capabilities for large table searches, as well as wildcard capabilities.

SOLUTION BRIEF

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Accelerated by Xilinx Alveo™ U50

HARDWARE PLATFORMS

• Xilinx Alveo™ U50 Data Center Acceleration Cards. (100 Gbps network I/O, PCIe Gen4, and HBM)

APPLICATION

- In-Memory-Database Engine for Redis
- Acceleration for Memcached
- Deduplication storage
- NoSQL Database

KEY FEATURE

- 150 Million searches per sec.
- Under 400 ns Latency
- Up to 512bit Key-Value total
- Table depth of up to 64 Million records powered by HBM memories on Alveo™ U50 Data Center Acceleration Cards

SOFTWARE CONTROLLER API OPTION

・Free, open-source client software API compatible with Python

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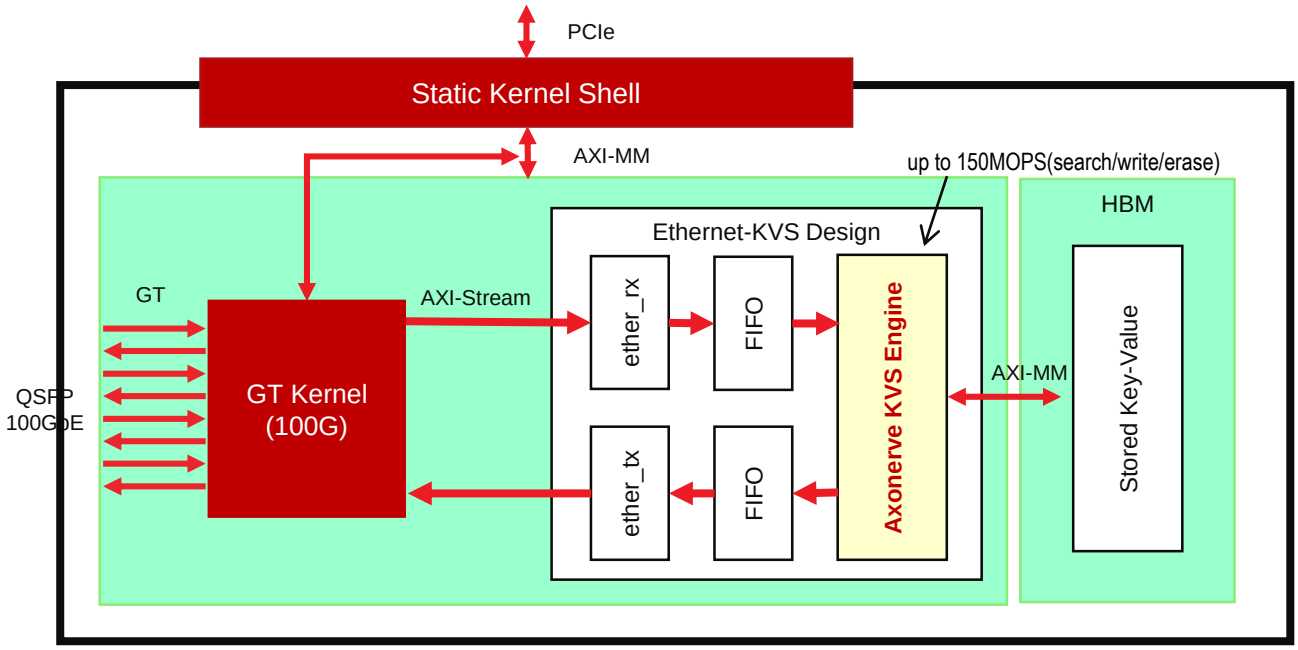
DESIGN METRICS:

KVS Search Rate	Up to 150 MSPS per Alveo™ U50
Table Depth	Up to 64 Millions records using HBM memory
Key Size	512bits for Key & Value total
Value Size	512bits for Key & Value total
Latency	Under 400 ns (excluding host bus latency)
Application Architecture	Python code (*1)
Accelerator Card support	Xilinx Alveo™ U50
Target Application Markets	Redis system (*2), Real-time data analytics, Connected cities, Security industries

(*1) https://github.com/miyo/axonerve_kvs_on_au50 (*2) Redis reference design: Under development

OVERVIEW



TAKE THE NEXT STEP

Learn more about Axonerve Lookup Engine (https://axonerve.com/)

Learn more about Xilinx Alveo accelerator cards (https://www.xilinx.com/products/boards-and-kits/alveo.html)