

Senior Software Engineer – kdb+ Acceleration & Systems Integration

Beaverton, Oregon (hybrid) | Exceptional remote applicants will be considered

Level: Senior/Staff

About the Role

Silicon45 is developing a distributed heterogeneous execution platform that coordinates CPUs, GPUs, DPUs, and FPGAs to accelerate data analytics and machine-learning workloads. We are seeking a Senior Software Engineer to own the software integration between kdb+/q and FPGA acceleration.

You will build the low-latency host software that identifies supported kdb+/q workloads, moves data efficiently to and from PCIe-attached accelerators, validates results against native kdb+/q execution, and provides safe CPU fallback when acceleration is unavailable or not beneficial. The goal is measurable end-to-end performance improvement with minimal changes to customer applications.

What You Will Do

- **Own the kdb+/q acceleration integration layer.** Design direct native-extension and gateway/IPC integration paths using documented kdb+ interfaces.
- **Implement query offload and fallback.** Identify supported q operations and query classes, route qualified work to the FPGA, and preserve normal CPU/kdb+ execution for unsupported or uneconomic offloads.
- **Build high-performance data paths.** Develop C/C++ software for PCIe/DMA transfers, pinned or shared memory, asynchronous queues, batching, and zero-copy techniques where practical.
- **Accelerate low-latency hot-window operations.** Support selected recent-data filters, rolling/grouped aggregations, and other predefined operations with millisecond-class latency targets.
- **Measure and optimize end to end.** Profile q, IPC, serialization, memory allocation, NUMA, PCIe/DMA, synchronization, networking, and accelerator execution; track latency, throughput, and CPU utilization.
- **Integrate with the Silicon45 runtime.** Work with FPGA and distributed-systems engineers on scheduling, resource discovery, partitioning, telemetry, and stable hardware/software APIs.

Minimum Qualifications

- 5+ years of software engineering experience with performance-critical systems, databases, runtimes, networking, storage, or accelerator integration.
- Expert C/C++ and deep Linux systems-programming skills, including memory management, threading, IPC, shared memory, mmap, affinity, NUMA, and debugging.
- Strong performance-engineering experience with profiling, tracing, hardware counters, benchmarking, latency analysis, and quantified optimization.
- Ability to reason about data movement across CPU caches, DRAM, PCIe, DMA engines, and accelerator memory.
- Experience integrating native software with a database, analytics engine, runtime, storage/network stack, GPU, FPGA, DPU, or similar accelerator.
- Strong automated testing, Git/CI, Python or similar scripting, and technical design/documentation skills.

Preferred Qualifications

- Hands-on kdb+/q experience, including q tables/vectors, temporal types, null semantics, performance tuning, and high-volume or real-time workloads.
- Experience with the KX C API / k.h, dynamically loaded C/C++ functions, q IPC, or comparable native database-extension APIs.

Compensation & Application

Compensation: Base salary plus equity, medical insurance, and 401(k).

Apply: Send your resume or CV to jobs@silicon45.com with a short description of one or two performance-critical systems you personally designed or optimized, including the bottleneck, your change, and the measurable result. Please do not include confidential information.