(intel®)

Real-Time Actionable Insights with Intel and Kx Systems

In-Memory Computing
Intel® Xeon® Processor E7 v4 Family

Detect subtle market signals, draw intelligent conclusions, and be the first to profit from emerging opportunities with real-time analysis of massive data volumes.

Customers in the financial services sector and beyond have long looked to Kx Systems' kdb+* to draw real-time intelligence from the combination of streaming data flows and historical data stores. A growing range of industries, which now includes utilities, pharmaceutical companies, and petroleum enterprises, look to kdb+ as part of their quest for the highest possible performance from large-scale data analytics.

From the start, the kdb+ database and its accompanying query language, q, have been architected to handle vast (and growing) data volumes. With each new generation of software and hardware, the high-speed database and its exceptional analytics capabilities have advanced to provide more sophisticated results from expanded data sets.

The full relational database system provided by kdb+ handles both in-memory and disk-resident data as a single entity. Consequently, it supports the full range of applications that need to draw data from both current and historical stores, for analytics in real time. This combined approach

is inherently more complete than databases that handle only one of these types of data, as well as more efficient than platforms that combine solutions from multiple providers to handle both. In distributed architectures such as clusters, grids, and clouds, kdb+ can scale to many petabytes of data and across many machines.

Optimization for the Intel® Xeon® processor E7 v4 family accelerates kdb+ operations on all types of data. In recent benchmark testing, kdb+ delivers a performance increase of up to 2.8x[1] on the latest Intel® architecture, compared to Intel systems that are a few years old.

Hardware Advances Deliver State-of-the-Art Performance
Across industries, analytics results reveal a simple truth: state-of-the-art performance requires state-of-the-art hardware. The latest systems based on the Intel® Xeon® processor E7-8800 v4 product family incorporate a range of features and capabilities that help customers reach faster insights from their kdb+ implementations.

To characterize the benefits of the latest processor generation, Intel and Kx Systems performed testing with the STAC-M3* benchmark, which characterizes analysis of time-series data such as tick-by-tick quote and trade histories used in many trading functions. As shown in Figure 1, performance increases on the workloads in this benchmark are up to 2.8x higher for a server based on the Intel Xeon processor E7 v4 family, compared to the processor generation from just a few years ago.[1]
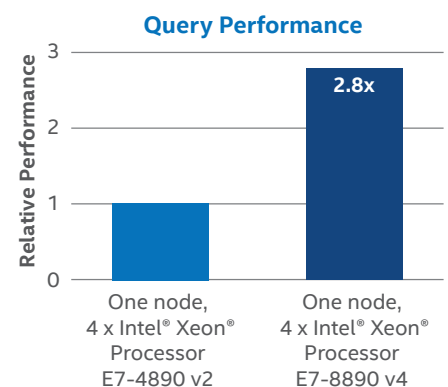

Query Performance

Figure 1. Accelerated query performance for a standard financial services benchmark.[1]

Massive Hardware Parallelism

With up to 24 cores per socket, the Intel Xeon processor E7-8800 v4 product family enables servers with massive hardware parallelism that support the sophisticated multi-threading design of kdb+. Many simultaneous software threads, running on multiple, multicore processors cooperate to divide and conquer demanding analytics tasks, so customers can utilize their largest data sets without bogging down the platform. A broader universe of data can yield more comprehensive insights, for better business decisions.

Advances in the Memory Subsystem

Since kdb+ holds huge data sets in main memory, it benefits from large amounts of RAM, expanding the scope of the streaming and historical data sources used, and thus enabling deeper insights. The testing reported on here uses 6 TB of memory in each of the systems, complemented by up to 60 MB of last-level cache per socket. Together, these features enable kdb+ to hold large data sets within system memory, accelerating the processor's access to data. As a result, customers can run complex algorithms against large data sets while retaining the ability to get real-time results. This large-scale, real-time computation enables enterprises to create innovative analytics that generate actionable results.

Conclusion

No matter their industry, customers that use kdb+ on the latest generation of Intel architecture have an increased opportunity to dramatically accelerate analytics.

In the financial services industry, discovering subtle market signals can mean the difference between profiting from being the first to react or missing an opportunity that goes to a competitor. For utility companies, more robust analytics can make smart meters more responsive to market conditions, increasing profitability. In pharmaceutical research, developing a new compound faster can mean accelerating time to market for breakthrough drugs. In oil and gas exploration, richer geophysical analysis can reveal hidden reserves that translate directly into profits.

The potential value from drawing faster, stronger conclusions from larger sets of data is unlimited. Kx Systems and Intel are working over the long term to bring those insights to light.

Learn more

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