KX

KX INSIGHTS™

Cloud-First, Real-Time Streaming Analytics

THE KX ADVANTAGE

Enabling companies to utilize real-time data for smarter real-time decisions

KEY FEATURES

Microservices-based real-time analytics on streaming and historical data

Leverages cloud standards and services for speedy development and delivery of actionable insights

Natively connected to cloud protocols for maximum security and interoperability

Full Kubernetes support for cloud, on-premises and hybrid deployments

Runs instantly from AWS, Google and Azure marketplaces

It's no longer just people who make critical business decisions. It's machines too in trading algorithms, control systems, recommendation engines and other forms of automated decision making. And because they are made every second of every day, the demands on a system to support them are onerous: it must operate in real-time on incoming events but incorporate historical data too for context, it must be scalable for both storage and burst processing when needed, it must provide high availability and fault tolerance, and it must connect widely across the enterprise as well as being secure, easy to use and flexible in deployment.

The Data Challenge
Not many systems meet those requirements. Most are based on an old-style polling model where data must first be persisted into a repository and then retrieved again before it can be evaluated. The problem is that in the interim the data has changed and with it the market has moved, the fault has occurred, or the opportunity has passed. That's no good if you need to know now, not later. For that, you need a streaming analytics solution like KX Insights.
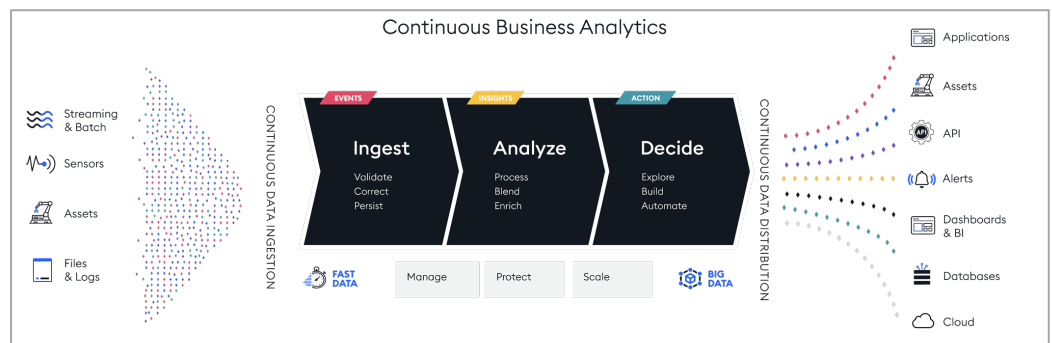

The Value of KX Insights
KX Insights, is a cloud-native platform for real-time analysis of any data, whether at speed or at rest, providing firms with dynamic insights into what's happening, right now. It leverages cloud technologies, services, and protocols that make solutions more scalable, robust and interconnected, as well as easier to deploy, manage and maintain. Advanced analytics and SQL querying of data enable users to derive insights, detect anomalies and automate responses – all in real-time.

KX Insights: Cloud-First, Real-Time Streaming Analytics
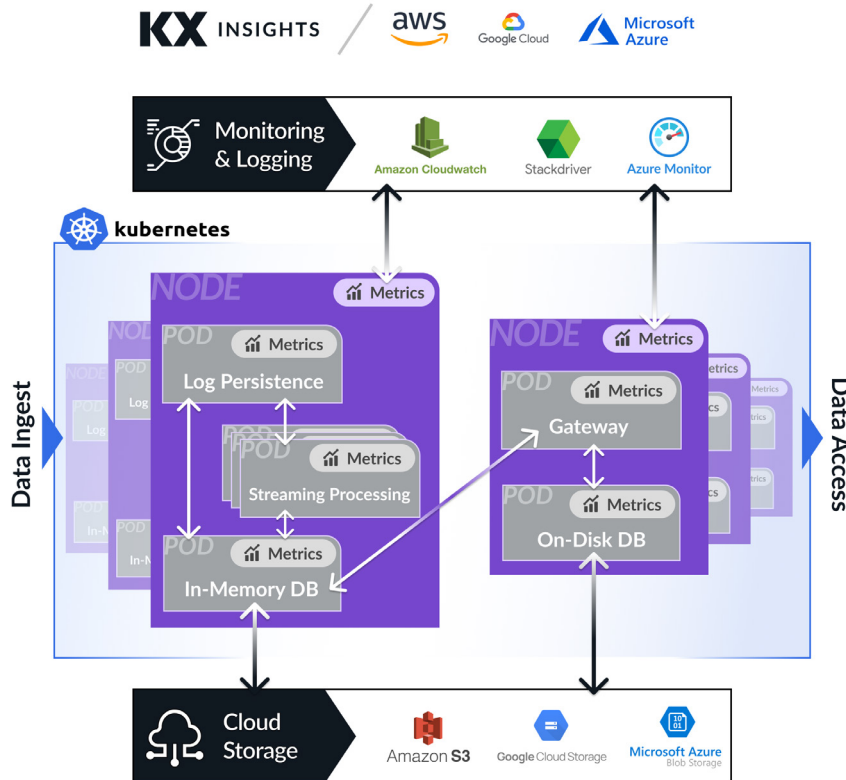
KX Insights taps not only the scalability and elasticity of the cloud but also the expansive catalogue of microservices that enable rapid, flexible development of new applications. The combination of unlimited resources and scalability enables developers to concentrate on core business functionality rather than dealing with infrastructure issues:

- Using a microservices approach, units of functionality are developed as self-contained units that can be quickly and easily orchestrated into applications, all benefiting automatically from the supporting scalability and fault-tolerance of the cloud
- Building upon open standards like Docker and Kubernetes provides both portability across cloud environments and deployment robustness to support regular updates on a Continuous Development/Continuous Integration (CD/CI) paradigm
- Adopting cloud-native technologies for security, access control and messaging increases interoperability and simplifies integration, while standards-based logging and monitoring protocols simplify support and maintenance

The platform enables organizations to couple the speed of kdb+ operationally with the flexibility of microservices to develop penetrating new insights and achieve continuous actionable intelligence using integrated tools for data visualization, SQL querying and Machine Learning. Development time is reduced by interfaces to third-party languages like Python, R and MatLab that enable developers to reuse existing libraries and functionality.

KX INSIGHTS™

DIRECT ACCESS TO LOW-COST STORAGE

KX Insights works natively with object storage, giving clients easy and cost-effective access to third party storage from the major cloud providers. Easy because it eliminates the need for third party plugins or conversion tools and lets user load or save data directly. Cost effective because object store is multiple times cheaper than regular storage. Data management microservices provide functionality for reading, writing, and aging policies across multiple storage media that enable cost-effective data lifecycle management while maintaining continued ease of access.

CLOUD-FIRST, REAL-TIME STREAMING ANALYTICS

KX Insights is used to analyse and improve outcomes in areas like performance, quality, yield, and design in industries ranging from automotive and semiconductors to energy and telecommunications, where the volumes of data from sensors, machines, and edge devices are especially challenging. KX is similarly used by financial institutions to trade, manage risk and detect fraud through analysis of the enormous volume and velocity of data they accumulate across prices, quotes, and transactions.

At the core of KX Insights is kdb+, a powerful time-series database that combines an in-memory compute engine, a real-time streaming processor and in-built time-series analytics using temporal datatypes, including nanosecond precision timestamps, for fast accurate querying across high-volume high-velocity data.

VISUALISATION OF RESULTS

Built-in visualization functionality provides instant insights into data along with analytics and flexible query tools for detailed drilldown and exploration of results. By combining hardware-accelerated rendering with virtual scrolling to reduce display time, and binary transfer to optimize data throughput, KX Dashboards can render millions of records per second. Throttling, conflation by time intervals and server caching provide further support in maintaining high-frequency updates across multiple users.
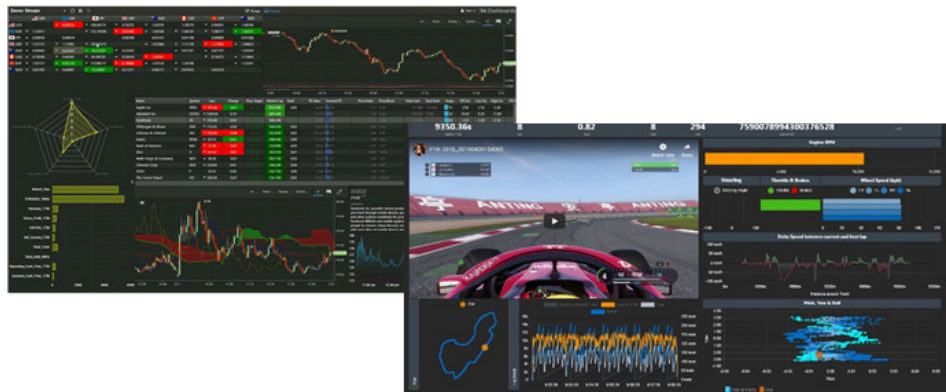
The visualization functionality of Dashboards can also be accessed and shared throughout the enterprise as a microservice.

KX INSIGHTS™

TRUSTED CLOUD SECURITY AND MESSAGING

The cloud has robust and proven protocols for establishing secure communication channels and guaranteeing delivery of messages. KX Insights provides an integrated secure enclave for storing cloud credentials, integration with standards-based authentication and access control protocols and connects directly to Google's Pub/Sub and AWS Kinesis streaming protocols and middleware solutions like Tibco, MQ or Solace.

SIMPLIFIED CONNECTIVITY AND INTEGRATION

Adopting REST as the primary communication interface eliminates the development, maintenance and risk of proprietary protocols and automatically provides connectivity options to other cloud services like Lambda, Pub/Sub, etc. KX Insights includes both Client and Server REST APIs for standardized and secure two-way consumption of data and services with third parties but continues to support IPC between native kdb+ processes as a high-performance alternative where required. Database connectivity based on widely used open-standards like ANSI SQL, PostgreSQL, ODBC and JDBC enables reuse of existing queries and simplifies migration to KX. Microservices support for OpenAPI provides further connectivity to third party data and services by enabling developers to publish and access native kdb+ functionality using industry standards.

STANDARDS-BASED SYSTEM MANAGEMENT AND MONITORING

In a world of multiple, remote, interconnected services a common methodology for monitoring their performance and processing their logs files for incident management and troubleshooting becomes increasingly important. KX Insights directs logs straight to cloud logging services for centralized management using standard tools e.g. Google Stackdriver. KX Insights can also publish application metrics over REST to standard cloud monitoring solutions e.g. AWS CloudWatch or Azure Monitor for easier and more timely oversight

FASTER DEVELOPMENT AND ROLLOUT OF NEW FUNCTIONALITY

The cloud significantly revises the traditional waterfall-type SDLC approach and replaces it with quicker and more agile methodologies that enable Continuous Integration and Continuous Delivery (CI/CD) where teams release production-ready software with every code change. KX Insights includes QPacker which builds and stages software artefacts for all cloud platforms for top-tier supported server languages (q, Python, Java, C) and is usable across CI/CD frameworks. It also uses HELM charts that make it easier to package and update KX Insights deployments on Kubernetes and therefore quicker to respond to evolving business requirements.

EASE OF DEPLOYMENT, FLEXIBILITY OF USE

By implementing cloud-native standards including docker and Kubernetes, KX Insights deployable on AWS, GCP, Azure but, for maximum flexibility, can also be deployed is on-premises and in hybrid configurations and on Red Hat Openshift.

DATA MANAGEMENT

Users of KX Insights have API access to core data management capabilities for cleansing, normalizing and validating data and reusing it consistently across the organization for accurate, informed data-driven insights. In addition, its native support for time-series operations vastly improves both the speed and performance of queries, aggregation, and analysis of structured data.

KX MICROSERVICES

In addition to being a consumer of cloud-based microservices, KX is a also provider of microservices that give customers the flexibility to easily integrate new capabilities into their processes.

Data Management Services

Data management microservices make it easier to manage data throughout its lifecycle, removing the need for consumers to develop complex access, tracking and location mechanisms.

- **Storage Manager:** Controls the capture, persistence and migration of data across storage tiers appropriate to performance needs, fault tolerance requirements and ageing criteria. It manages the physical location of data.

- **Data Access:** Provides read-only access to data regardless of where it currently resides across its storage lifecycle (in-memory, on-disk, object storage). In effect, it collapses distributed data sets into one from the perspective of the consumer who no longer needs to know its specific location.

- **Service Gateway:** Provides a consistent interface for coordinating requests and routing them to supporting services that may change over time, thereby eliminating the need for consumers to track changes in implementation.

Data Processing and Visualization Services

Microservices make the high-performance capabilities of KX for ingesting, transforming, processing, enriching and visualizing data available to non-KX users.

- **Stream Processor:** A high-performance, scalable event stream processing engine providing easy access to complex analytics like joins, aggregations and windowing functionality for processing and enriching data.

- **Dashboards:** An interactive data visualization service that enables both non-technical and power users to query, transform, share and present live data insights.

Integration and Connectivity Services

Accessing KX functionality from other technologies is made easy with discovery services providing an inventory of what it available and OpenAPI libraries providing a standardized methodology for accessing them.

- **Service Discovery:** Delivers a cloud-native, scalable registry which stores, manages and distributes running services and their metadata for all other services within the microservices-driven environment.

- **OpenAPI:** Provides OpenAPI specifications for all microservices and a library for generating server stubs to an OpenAPI specification, enabling third parties to invoke KX functionality from within their native code and vice versa for KX to access other technologies.