

TIBCO and the New Era of Kafka Enterprise Analytics

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Developers love Kafka because it's an easy way to integrate software systems with real-time data. But while Kafka provides a lot of value to developers, business users are blind to any insights that might be found flowing through it. Until now.

Recent analytics technology innovations make it easy to explore what's happening inside your Kafka infrastructure, by making Kafka topics native for self-service business intelligence. Better yet, it can now take just a few minutes to connect Kafka to a real-time, visual analytics tool. And better yet still, the insights you can uncover are real time.



Here's how business intelligence and advanced analytics tools can work seamlessly with your Kafka infrastructure.

Introducing Streaming Business Intelligence for Kafka

To business users, Kafka can seem like a cable TV station you haven't subscribed to because, unless you're a developer, insights are hidden within Kafka messages. Streaming Business Intelligence, or Streaming BI, is a new class of technology that connects Kafka topics directly to TIBCO Spotfire software for a visual exploration experience that's alive, with charts, analysis, and aggregations all updating continuously as messages flow through your Kafka fabric.

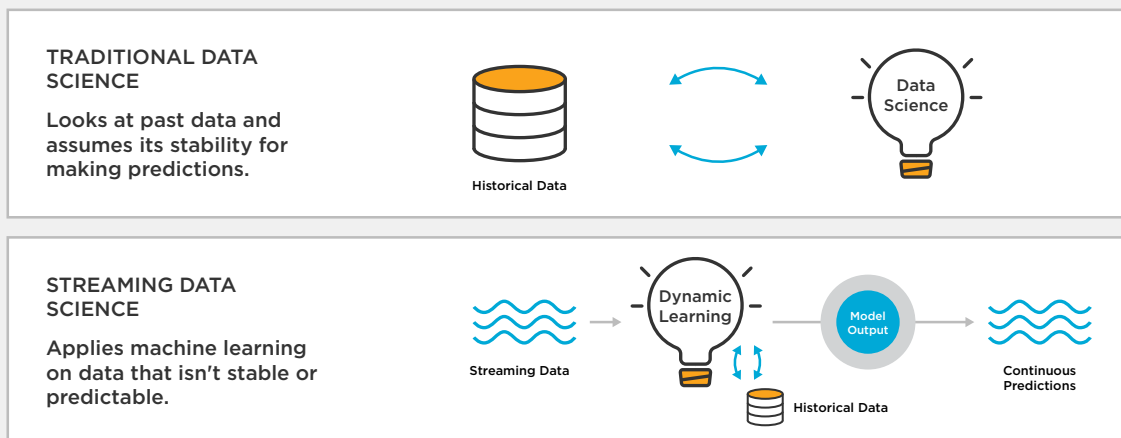
Here's how it works. You connect to new TIBCO Spotfire Data Streams software with a graphical wizard tool, and choose the topics you want exposed as streaming tables. It takes just a few minutes to set up. Then, a business analyst and Spotfire user can open a streaming table like any database table, except the contents become live (continuously update) in the visualizations created: bar charts, bubble charts, sparklines adjust with each new event placed on Kafka that matches the query. For examples of streaming BI in action, check out this video showing [streaming BI analyzing streaming webcam video with Tensorflow](#), [streaming BI analyzing streaming IoT sensor data from connected drilling equipment](#), and [streaming public transportation data for smart city applications](#).

Each visualization submits continuous queries to the streaming engine, which is like a database but designed for streaming Kafka data. The questions are retained and continuously evaluated against every message on Kafka as they arrive. When the matching result set for the visualization changes, the new data is pushed to the BI tool, and everything is updated in real time. Alerts fire. Colors change. Analysts can decide to examine whatever slice of time they wish: the last 30 seconds, 30 minutes, and/or 30 days. The power is in their hands. With streaming business intelligence, continuous insight on Kafka topics is placed at the fingertips of any business analyst, with no programming, no hacking KSQL, and without weeks, months, or years of custom dashboard creation from IT.

Streaming Data Science and Kafka

This same technology powers [streaming data science](#). Traditional data science operates on historical data. This works well for applications involving conditions that essentially stay the same — where the same patterns, anomalies, and mechanisms observed in the past will continue into the future. But this traditional approach to predictive analytics is really looking at the past, rather than the future. By using real-time data from Kafka, data scientists can do more.

In modern digitally connected situations, conditions change frequently, and Kafka is the technology equivalent of your body's nervous system that can sense and respond to changes in the world. Digital sensory inputs from real-time Kafka events can be used to continuously score data science models and update predictions. When you inject a model into the Kafka stream, predictions are adjusted as conditions change. Java, PMML, R, H2O, Tensorflow, and Python models can all be executed against sliding windows of Kafka messages.



The New Art of the Possible with Smarter Kafka Analytics

Streaming business intelligence and streaming data science make Kafka better and flips the traditional backwards-looking model of data processing on its head. In effect, business analysts can now query the future, because the analyst poses questions that look forward, not backwards.

Not sure where to start? Here's how to think about the new art of the possible. First, imagine the data you might have on Kafka that changes frequently: sales leads, transactions, connected vehicles, mobile apps, wearable devices, social media updates, customer calls, robotic device state changes, kiosk interactions, social media activity, website hits, customer orders, chat messages, supply chain updates and file exchanges.

Then, think of questions that start with "tell me when . . ." These are questions about the future: Tell me when a high-value customer walks into my store. Tell me when a piece of equipment shows signs of failure for more than 30 seconds. Tell me when a plane is about to land with a high-priority passenger aboard at risk of missing their connection.

New Use Cases for Smart Kafka Analytics

Continuous Intelligence with Kafka enables entirely new applications that leverage real-time data.

Bank risk officers can continually check for anomalies within trades, orders, market data, client activity, account activity, that indicate suspicious trading activity, profitable trading opportunities, and potential compliance violations.

Supply chain, logistics, and transportation firms can query the future of sensor data from connected vehicles, assets, and supply chain partners in real time, identifying the most impactful problems and opportunities to help analysts optimize future logistical challenges.

Smart City analysts can monitor Kafka data from GPS, traffic sensors, buses and trains to help predict and react to dangerous conditions before they cause harm or surprise, and to delight citizens with exceptional service.

Energy companies can analyze sensor data from industrial equipment to spot and prevent production issues before they happen. An oil and gas customer says that these systems lead to billions of dollars in savings.

These questions can trigger math, rules, or a machine learning model, and can be answered millions or billions of times a day. And, when answered, your BI tool will call you; you don't have to sit around and wait. Most companies don't bother asking "tell me when" questions because, well, their tools couldn't answer them. Now they can.

Why Not Use KSQL or a Database for Kafka?

Streaming analytics tools provide a graphical domain-specific logic expression designed for subject matter experts that complements the open source coding regimen of Kafka developers. So, the two environments are complementary.

KSQL allows developers to query Kafka data, but not in a real-time, continuous, forward-looking way. BI tools don't support KSQL, so they're not self-service, and require developers to implement custom apps. So, using KSQL for analytics is like buying a hammer and expecting to get a house as a result—there's a lot more to it. Or, your IT team could store Kafka messages into a database using SQL. But once again, this is expensive, slow, and custom.

Streaming BI instantly makes Kafka useful by providing insight without coding. No need to build a house—you just move in! Connect Kafka to your BI tool with the click of a button and prepare to experience a continuously live, immersive BI experience. And, if you want to aggregate data differently, create automated actions on streaming data, you can do it via a set of graphical citizen developer tools, on top of Kafka.

Fusing Continuous Intelligence and History

There's just one more thing. For the first time, streaming business intelligence helps you combine real-time insight with historical insight, which lets analysts compare real-time conditions to what has already happened. This is analytics nirvana.

For example, airline operations might use Kafka to capture data about frequent flyers as they check in for flights. They can analyze their current situation with their flight history, preferences, propensity to purchase upgrades, and loyalty information. By combining real-time awareness with historical insights, smarter decisions can be made in the moment based on real-time Kafka data and historical data stores.

Continuous Intelligence turns Kafka data processing on its head

Streaming business intelligence, streaming analytics, and streaming data science turn how you think about Kafka upside down. Instead of only being used by developers, business users can now get self-service access to Kafka data. Instead of hand-writing every Kafka application, SMEs and business analysts can extend Kafka logic on their own, quickly. And instead of looking only at the past, business users can see what's happening now, and better anticipate what might happen in the future.



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