SAP Solution Brief
SAP HANA Platform | SAP HANA Streaming Analytics

Turn High-Volume, High-Velocity Streams of Data into Actions

SAP Run Simple

Harness the power of high-velocity, high-volume data

Millions of connected things are generating a surge of data that businesses can harness to gain insight and take action. But with data arriving as individual events at high speeds – as many as hundreds of thousands or millions of events per second – the potential of this data can go unrealized. Businesses need a way to **collect, analyze, and act on data as it is generated**.

As the number of sensors and Internet-of-Things devices expands and the flow of live event information from mobile and online applications increases exponentially, organizations must move beyond simply understanding the status of an event. They need to understand how that event falls within the context of a business process such as manufacturing assembly, supply chain with inventory and logistics components, or even the wider concept of a smart city. But how?

The answer is the SAP HANA® streaming analytics option. With it, your organization can capture and analyze event information from multiple streaming sources, provide subsecond response, and aggregate events for long-term storage. You can monitor the incoming event stream from your internal environment or external sources to identify trends, patterns, and correlations in near-real time. With this information, you can push notifications to the proper stakeholders for resolution or initiate automated actions when response latency is at a premium.

Process live event streams

SAP HANA streaming analytics is an extremely scalable complex event processor for the SAP HANA platform that securely collects data from thousands of devices – not after the fact but as fast as devices send it. As important, it enables you to actively monitor and understand this data to reveal opportunities and risks.

With SAP HANA streaming analytics, you can examine incoming events in the context of other events. An event could be something as simple as a smart meter reading or the temperature measurement coming from a sensor in a machine, or as

complex as a train arriving at a station. In many cases, a single event may not contain much information, but when it is combined with other events, you may be able to observe a trend or pattern that is very meaningful.

Integrated machine learning capabilities in SAP HANA streaming analytics allow you to incorporate live input data into prediction algorithms rather than polling an external data source periodically. This capability helps you to anticipate situations and automate responses so you can instantly adapt to changing conditions and behaviors.

Process live event streams

Analyze data in motion

Act in real time
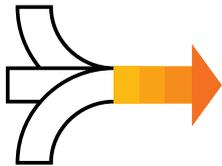
Designed for **speed and scalability**, SAP HANA streaming analytics allows you to analyze and act on data as fast as it arrives.

Analyze data in motion

Running as a separate process within the SAP HANA platform, SAP HANA streaming analytics receives and processes events as they stream in. Incoming data can be filtered, normalized, and enriched to provide greater value and context, enabling the application of complex business rules.

The outputs of a streaming analytics project are actions as simple as real-time alerts and updates to dashboards, or as complex as initiating an emergency response or updating a continuous manufacturing process. Outputs can also be logged to data stores, for example, when storing high-value records in SAP HANA and sending lower-value audit trail records to the SAP HANA dynamic tiering option, SAP® IQ software, or Apache Hadoop database software. (See the **figure** on the next page.)
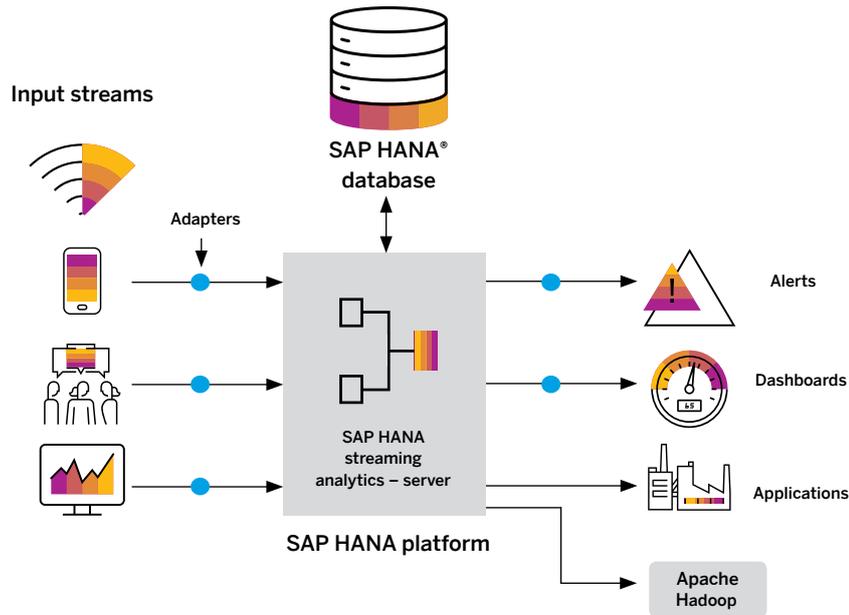
As SAP HANA streaming analytics is collecting and storing data, it also actively monitors the data to watch for trends, patterns, and correlations. This is its real value – active monitoring that enables a rapid response to what's happening.

With SAP HANA streaming analytics, you can analyze events in the context of other events and historical data, apply predictive analytics to anticipate what's coming, and apply rules to determine what action to take. For example, the system can alert a group or person to take action, or it can initiate an automatic response to urgent threats, such as shutting off equipment.

Process live event streams

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Input streams

SAP HANA® database

Adapters

SAP HANA streaming analytics – server

SAP HANA platform

Alerts

Dashboards

Applications

Apache Hadoop

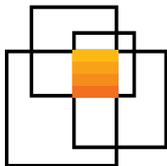Process live event streams

Analyze data in motion

Act in real time

Figure: Addition of real-time streaming analytics to the SAP HANA platform

Act in real time

SAP HANA streaming analytics amplifies the power of SAP HANA by enabling event-driven action. The streaming analytics server processes millions of requests per second, while context filters aggregate data to catch what's important in real time so you can act on new information.

You can define continuous queries that are updated constantly as new events arrive and publish outputs based on these events. The streaming analytics server continuously updates information in SAP HANA to help ensure that your people and your business applications are accessing the most current information.

Streaming analytics is particularly useful in applications where there is fast-moving data and value to be gained from processing it in real time. (See the **table** on the next page.) This includes applications where businesses need to perform one or more of the following functions:
• Situation detection
• Continuous computation
• Application integration with intelligent event handling
• Collection, filtering, and archiving of persistent data

Process live event streams

Analyze data in motion

Act in real time

Process millions of requests per second to catch what's important in real time for **immediate insight and action**.

Scenarios where SAP HANA® streaming analytics can add value

Situation detection

- Watch for trends or patterns
- Spot significant changes
- Monitor correlations
- Compare current values to historical norms
- Apply predictive models to anticipate what's coming

Alerts

- Alert a supervisor when a machine needs adjustment before quality is affected
- Alert IT staff as soon as a security threat is detected

Automated responses

- Adjust prices automatically based on market conditions
- Dispatch a technician for urgent preventive maintenance
- Tailor an offer to a user based on current activity
- Shut down a system to prevent damage

Operational dashboards

- Inform strategic and operational decisions through continuous computations of KPIs
- Stream summary data, updates, and alerts

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Realize the benefits of streaming analytics

With real-time analysis of business-critical data, SAP HANA streaming analytics enhances your ability to identify emerging opportunities and take action. In machine learning applications, it allows you to adapt to changing conditions in real time – for example, to manage operations maintenance and predict outcomes to minimize safety risks.

By generating insights from high-volume and high-velocity data, SAP HANA streaming analytics helps identify relationships among various business processes in real time to reveal patterns and trends. It provides a current view of situations so you can anticipate short-term demand changes, not just

react after the fact. These features combine to help you:
• Reduce operating expense by minimizing the impact of variability and negative events
• Lower regulatory risk and cost of compliance through increased visibility
• Lower cost to serve by increasing customer intimacy and responsiveness
• Better predict business and operational outcomes to take proactive or automated action
• Enhance innovation and the value of assets and intellectual property by leveraging insights from machine, behavior, and network data

Realize the benefits of streaming analytics

Summary
The SAP HANA® streaming analytics option adds high-speed event processing to the SAP HANA platform. It gives you the ability to collect, monitor, and understand live streams of data as it's generated to identify trends, patterns, and correlations and enable immediate insight and action. Integrated machine learning capabilities process input data through prediction algorithms so you can anticipate situations and instantly adapt to changing conditions.

Objectives
- Apply complex processing logic to generate predictions and alerts, enabling systems to act in real time
- Gain insight and identify relationships and patterns in live data

Solution
- Analysis of raw machine data for capturing useful insights
- Real-time alerts and automated responses based on predefined rules
- Integrated machine learning capabilities to enable predictive analysis
- SQL-based event processing language
- Custom operators and functions
- Fast, scalable data processing

Benefits
- Reduce operating expense by minimizing the impact of variability
- Better predict business and operational outcomes
- Enhance performance by leveraging insights from live data

Learn more
To find out more, explore our advanced **analytics solutions**.

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