What does SAS® Event Stream Processing do?
SAS Event Stream Processing analyzes and understands streaming data as it is being generated, detecting patterns of interest as they occur, and provides the necessary instructions to know the correct actions to take, what alerts to issue and what portions of data should be retained for further investigation.

Why is SAS® Event Stream Processing important?
This technology gives you the power to derive value from fast-moving big data as it streams in from operational transactions, sensors, devices, transmissions, etc., before it is even stored. It can analyze millions of events per second, helping you decide what’s important, what can be ignored and what should be stored.

For whom is SAS® Event Stream Processing designed?
As a configurable and embeddable engine, SAS Event Stream Processing is designed for application developers, IT engineers and system engineers. A web-based interface makes it easier to manipulate data and build models, while a dashboard delivers information visually to decision makers and business analysts.

SAS® Event Stream Processing
Act on big data while it’s in motion to know the real-time pulse of your business

Benefits
- **Get instant information, take immediate action.** Streaming data from operations, transactions, sensors and devices is more valuable when you capture key insights from it in real time. Regardless of data type (or source), SAS brings the immediate value of streaming analytics to a host of applications, including customer experience, asset performance, fraud, compliance, security, etc.
- **Scale to handle large amounts of data.** Faster, better and more powerful stream processing ensures low latency, high-volume throughput of hundreds of millions of events per second. Continuous queries run faster in the flexible threaded processing model, which natively supports updates, deletions and insertions while data is in motion.
- **Make sounds decisions based on sound analyses.** Having accurate data at your disposal means you’re always prepared to take the right action. Event stream processing from SAS provides in-stream data quality as well as prebuilt analytic expressions and pattern-matching algorithms for data that drives smart business decisions.
- **Take full control and adapt to changes quickly.** No matter how fast your data moves, or how much data you have, or how many data sources you’re pulling from, it’s all stream-lined and under your control from a single, intuitive interface. You can define patterns and address scenarios from any aspect of your business, giving you the power to stay agile and tackle issues as they arise.

Staying competitive in a big data world means working fast and making decisions even faster. You need to assess continuously changing conditions, monitor for events of interest as they happen and produce the intelligence needed to take action immediately. With event stream processing, the data doesn’t stop. Continuous queries constantly analyze live data to detect patterns of interest so you can respond in real time.

SAS Event Stream Processing helps you understand events while they are in motion (known as event streams). Instead of the traditional “stream, score and store” model, queries are stored and data is streamed through them. Data is analyzed continually as it’s received, updating the situational intelligence as new events take place. Value, which otherwise would be lost through information lag, is captured immediately. The solution is designed for optimal performance with a flexible processing model that provides submillisecond response for high-volume throughput.
Overview

SAS Event Stream Processing handles large volumes of streaming data quickly – millions of events per second – helping you understand events in motion, even as these events are generated. No stream of data is too big or too fast. The solution is designed for exceptional processing speeds, bound only by the limitations of the hardware environment.

Incoming data is read through adapters and connectors, which are part of a publish-and-subscribe architecture. Event data is read from a specified source and published into a defined window of an event stream processor. A point-and-click interface provides easy access to the windows and connectors, making it simple to define very complex, continuous queries through which the data will stream. Streaming data is examined for patterns and can be intelligently filtered to retain anomalies that demand deeper investigation. Or, if no relevancy is detected, the data can be discarded instead of being stored. Downstream applications can subscribe to receive the streaming analysis results.

Consume and connect streaming data

Is your data center prepared to handle the rapid growth projected for the Internet of Things data? Many are not. Even data streams generated from current web transactions, sensor devices and operational systems can be a challenge to consolidate and fully exploit. SAS Event Stream Processing provides the power to consume a wide and mixed array of data streams, and easily integrates the results into existing systems and applications. An extensive suite of source adapters and connectors enables you to manipulate live data streams to detect, filter, aggregate, correlate and delineate patterns of interest. Actions are applied to both structured and unstructured text data, and the effort to connect to other systems is efficient and cost-effective. Your organization can consume the data sources it needs today with the capacity to extend for tomorrow.

Adaptable, visual in-stream analytics

SAS Event Stream Processing provides a highly visual, interactive interface for building modular, continuous queries that use SAS advanced analytic algorithms and rules to pinpoint event relevance. System engineers and application developers have point-and-click access to the palette of windows and connectors, making it easy to design complex streaming analytical models. An interactive test mode lets users evaluate logic and validate results before deployment. Events can be shared across projects and historic activity can be retained and compared to current events – all from the visual drag-and-drop environment. This means data in motion can be easily defined, updated and revised to address new and quickly emerging events.

Advanced pattern-matching

Processing within streams has never been easier. SAS Event Stream Processing provides parsing, filters, joins, field calculations and pattern-matching functions available right out of the box. This includes functions specifically designed for routine data management tasks, like transformations, normalization, matching, identification and more. Similarly, prebuilt aggregate functions can be edited along with definition of custom functions to further increase flexibility to handle specific event assessments. Unstructured text processing functions provide natural language processing (NLP) extractions of concepts, entities and facts, as
well as classification of text and sentiment identification. Complex pattern matching is enabled for even the most sophisticated event stream analysis, with multiple events that can be examined within a single query. This unique pattern-matching facility allows you to define sequential or time-based (temporal) events within any project.

Visual monitoring of event streams
Understanding conditions and situational status is critical. Streaming visualization, alerts and notifications provide immediate understanding and instructions for how to react to what's happening now. You can continuously monitor event stream activity with a browser-based stream viewer. This configurable dashboard allows you to easily and quickly discern what is within acceptable thresholds and what is trending outside of desired norms. The technology also issues alerts and notifications as part of pattern detection. When you need to understand live conditions, streaming visualization gives you an immediate and easily recognizable picture of real-time events.

Optimized processing that scales
With event stream processing, systems need to be online, all the time. Native failover and other fault-tolerance functions help ensure continuous processing. And event stream processing must be very fast, which demands optimal performance. Low latency and high-volume processing of millions of events per second, with submillisecond response times, give SAS Event Stream Processing the power to outperform other stream processing engines. The distributed in-memory grid processing linearly scales as your data grows, helping optimize your hardware investments.

Flexible threaded processing model
For additional performance gains, take advantage of highly modular, continuous queries that support customizable, project-based threading to process alternate scenarios differently. Production performance can be set differently from testing performance, and you can slow performance to gain in-depth evaluation when testing scenarios. A mixed-processing mode
Key Features (continued)

**In-memory distributed and optimized processing that scales**
- High-volume processing of millions of events per second. Low latency response times (millisecond, submillisecond).
- All retained and aggregated data is kept in memory in indexed stores, with indices to each event field. Joins are permitted between primary and secondary indices.
- Uses a pipeline processing architecture and a flexible threaded processing model, taking full advantage of distributed grid architectures.
- Events are published as event blocks for improved performance.
- Includes configurable, flexible thread-pool sizing for refining and customizing processing speeds.
- Easily configure different levels of determinism and set different rates for development, test and production execution without modifying the processor structure.
- Caching store available if data sizes exceed available distributed memory and associated performance is within tolerance levels.
- Includes native failover and other fault-tolerance functions to ensure successful event stream processing activity.
- Full and open access to all event metadata.

**Enterprise administration and management**
Centralized administration and management of event stream processing activities are key to enforcing IT command and control of project handling, processing optimization and maintenance. The solution provides transparent governance that aligns to business requirements. A caching store is also available if data sizes exceed the available memory.

**Complement other SAS® solutions with streaming analytics**
SAS Event Stream Processing extends other SAS solutions such as SAS Customer Intelligence, SAS Asset Performance Analytics, SAS Security Intelligence and more. These domain-specific applications can identify patterns of interest to SAS Event Stream Processing for continuous monitoring. Anomalies can be flagged in stream and sent to SAS solutions for in-depth identification, in turn defining new patterns of interest to monitor. This multistage analytics ensures constant monitoring of defined patterns that are directly integrated with a continuous analytical cycle for new pattern discovery and innovation.

To learn more about SAS Event Stream Processing system requirements and see other related material, please visit: sas.com/eventstream.