SAS® Event Stream Processing 4.1 and 4.2: What's New

What's New in SAS Event Stream Processing 4.2

Overview

SAS Event Stream Processing Release 4.2 provides the following enhancements:

- enhancements to compatibility with the SAS Viya platform
- enhancements to the adapter manager
- new authentication capabilities
- additions to connectors and adapters
- enhancements to Streamviewer
- miscellaneous enhancements

Enhancements to Compatibility with SAS Viya

The LoadStreams CAS action set is now available for SAS Cloud Analytics Server. This action set, which interfaces directly to SAS Event Stream Processing, enables a CAS server to extract data from an event into an in-memory CAS table for analysis. A metadata query is supported that returns a table that contains data about projects, continuous queries, and windows.

For more information, see the *SAS Cloud Analytic Services: System Programming Guide*.

Enhancements to Adapter Manager

Authentication through SASLogon for SAS Event Stream Processing in Viya is now available. Within the adapter manager configuration file, the `<esp-engine>` element now accepts an additional property, `<auth-user>`, that specifies the SASLogon user name. Together with the **`.authinfo`** file, adapter manager can deploy projects and publish data to a remote server with SASLogon enforced. For more information, see "Using the Adapter Manager with SASLogon" in SAS Event Stream Processing: Advanced Topics.

Users can dynamically add an event stream processing server (with SASLogon enforced) to adapter manager's router using the REST API.

The raw source in adapter manager can now refer to a connector in a separate project.

New Authentication Capabilities

The following can now provide a user name and password to authenticate against a SASLogon service URL:

- publish/subscribe clients
- Camel clients
- XML clients
- adapters
- the adapter manager

HDFS adapter users can now authenticate against a Kerberized Hadoop grid using native Java Kerberos.

Authentication to Camel now includes the following:

- new parameter for OAuth authentication
- new parameter for SAS Logon authentication

For more information, see *SAS Event Stream Processing: Security*.

Additions to Connectors and Adapters

- There is a new optional `repeatcount` parameter for bounded file and socket connector and adapter publishers.
- The `rate` parameter is now supported by the file and socket connector publisher and adapter.
- There is a new optional `header` parameter for the file and socket subscriber that writes a comma-separated line of field names.
- All publisher connectors and adapters now write an information-level log message every five seconds. The message shows the current publishing rate in events per second
- The CAS adapter now support the extraction of the user password from an **`.authinfo`** or **`.netrc`** file.

For more information, see *SAS Event Stream Processing: Connectors and Adapters*.

Enhancements to Streamviewer

Streamviewer now provides a new chart type to display geographic charts. The window on which you build this chart must have fields that map to latitude and longitude.

For more information, see *SAS Event Stream Processing: Visualizing Event Streams with Streamviewer*.

Miscellaneous Enhancements

- This release adds Swagger support to the REST API for online documentation. The **`swagger.json`** file contains the REST API. You can send REST requests through the Swagger UI when you load the file.
- There now is a REST request to retrieve server health.
- You now can enable router statistic logging in the router configuration. If enabled, there are new REST requests to retrieve these statistics.
- The event stream processing server can now be configured to maintain a metering source window. This metering window tracks the number of events processed within a specified interval.
- There is a new Apache NiFi example in **`esp-examples/java/nifi/trades`** that does the following :

  - loads trade data from a CSV file
  - infers the AVRO schema from the file and passes it into PutESP
  - publishes the trade data into the broker surveillance model
  - subscribes to the brokerAlertsAggr window in the broker surveillance model and writes the events as JSON
- Multiple raw sources can now publish to the same window in an engine. The raw source name no longer has to be the same as the window name.
- Multiple project XML files are now supported. The adapter manager configuration file can refer to these multiple XML files.
- There now is a tool to convert XML models from the 3.2 XML schema to the 4.2 XML schema. For more information see, "Migrating XML Code across Product Releases" in SAS Event Stream Processing: XML Language Dictionary.

What's New in SAS Event Stream Processing 4.1

Overview

SAS Event Stream Processing Release 4.1 is the first release to provide compatibility with the SAS Viya platform. Even though it now uses the SAS Viya deployment tools and process, SAS Event Stream Processing is a stand-alone product that can coexist with either SAS Viya or with SAS 9.4.

SAS Event Stream Processing 4.1 provides the following new features and enhancements:

- new adapter manager
- enhancements to SAS Event Stream Processing Studio
- new connectors and adapters
- enhancements to connectors and adapters
- new event generator
- new router
- Cloud enablement
- enhanced Streamviewer
- new Python publish/subscribe API
- new Apache NiFi ESP processor
- enhancements to windows
- product is now internationalized
- disk footprint reduction
- support for upgrades
- changed XML elements
- changed function

New Adapter Manager

SAS Event Stream Processing now provides an Adapter Manager for adapter orchestration and grid publishing. It enables you to map sources from edge devices to event stream processing engines that are provisioned within the cloud. It enables you to deploy SAS Event Stream Processing as a service in a PaaS platform such as Cloud Foundry.

For more information, see "Running the Adapter Manager" in SAS Event Stream Processing: Advanced Topics.

Enhancements to SAS Event Stream Processing Studio

Ability to Create Learning Models in SAS Event Stream Processing Studio

You now can use SAS Event Stream Processing Studio to create scoring and learning procedural windows for various learning algorithms. For this release, the k-means clustering algorithm and the DBScan density-based clustering approach are available. For an example, see "Example: Creating a Procedural Model with Scoring and Training" in SAS Event Stream Processing: Using SAS Event Stream Processing Studio.

Ability to Write a Project's MAS Event Stream Input Handler Logic to a File

You now can use SAS Event Stream Processing Studio to write a projects Micro Analytics Service (MAS) event stream input handler logic to a file. Then you can use the XML client to dynamically submit the changed event stream input handler logic to a running project.

New Connectors and Adapters

- BoardReader — for more information, see "Using the BoardReader Publisher Adapters" in SAS Event Stream Processing: Connectors and Adapters.
- Cassandra — for more information, see "Using the Cassandra Adapter" in SAS Event Stream Processing: Connectors and Adapters.
- Kafka — for more information, see "Using the Kafka Connector for Kafka 0.9 and MapR Streams" in SAS Event Stream Processing: Connectors and Adapters and "Using the Kafka Adapter for Kafka 0.9 and MapR Streams" in SAS Event Stream Processing: Connectors and Adapters.
- MQTT — for more information, see "Using the MQTT Connector" in SAS Event Stream Processing: Connectors and Adapters and "Using the MQTT Adapter" in SAS Event Stream Processing: Connectors and Adapters.
- SAS CAS Analytic Server — for more information see "Using the SAS CAS Analytic Server Adapter" in SAS Event Stream Processing: Connectors and Adapters.
- Twitter (firehose) — for more information, see "Using the Twitter Gnip Publisher Adapter" in SAS Event Stream Processing: Connectors and Adapters.

Enhancements to Connectors and Adapters

- file and socket publisher support for the ArcSight Common Event Format
- sniffer support for SSL/TLS Client Hello packets and HTTP on ports other than 80
- support for encrypted passwords in the following connectors and adapters:
  - Database
  - MQTT

  - Rabbit MQ
  - Solace Systems
  - Teradata Subscriber
  - Tervela Data Fabric
- support for encrypted passwords in these C and Java client transports:
  - Rabbit MQ
  - Solace Systems
  - Tervela Data Fabric
- REST adapter support to build a request from a single opaque field, parsing arrays in a response, and listing allowed HTTP status codes
- JSON and XML publisher support to add static fields to every event, and for ignoring fields that are missing in source window schema
- the ability to add opcode and flags to CSV in the following publisher connectors and adapters:
  - HDFS (Hadoop Distributed File System)
  - IBM WebSphere MQ
  - Java Message Service (JMS)
  - Kafka
  - MQTT
  - Tibco Rendezvous (RV)
- support for a project quiesce parameter in the following Java publisher adapters: Cassandra, SAS Data Set, HDAT, HDFS, and LASR
- the ability to publish an opaque string with a configurable Insert or Upsert opcode to the HDFS publisher adapter
- transition from DataFlux ODBC drivers to SAS ODBC drivers
- added failover support to include Kafka 0.9 message bus

For more information, see "SAS Event Stream Processing: Connectors and Adapters" in SAS Event Stream Processing: Connectors and Adapters.

New Event Generator

You now can use an event generator to generate event streams and publish into an event stream processing model. Event generators can be created, destroyed, started, and stopped through the SAS Event Stream Processing HTTP interface. For more information, see "Using Event Generators" in SAS Event Stream Processing: Using the XML Layer.

New Router

The new router enables you to integrate multiple event stream processing engines with one another. Integrating multiple engines can be useful in a variety of circumstances. For more information, see "Using the Router" in SAS Event Stream Processing: Using the XML Layer.

Cloud Enablement

SAS Event Stream Processing is now cloud-ready. You can deploy it almost anywhere, from data centers to edge devices and from physical machines to clouds. You can implement engines and adapters on different virtual machines. For more information, see "Using SAS Event Stream Processing with a Cloud Infrastructure " in SAS Event Stream Processing: Advanced Topics.

Enhanced Streamviewer

You now can save and load subscriptions and SAS graphs and their customized settings in dashboards. These dashboards are stored in a configuration database. You can use one of several supported enterprise databases or the stand-alone, file-based RDBMS SQLite that is provided with the product. Graphs and tables have been visually enhanced. For more information, see "SAS Event Stream Processing: Visualizing Event Streams with Streamviewer" in SAS Event Stream Processing: Visualizing Event Streams with Streamviewer.

New Python Publish/Subscribe API

SAS Event Stream Processing 4.1 now provides a Python publish/subscribe API. It was developed and tested using Python 2.7.x. For more information, see "Using the Python Publish/Subscribe API" in SAS Event Stream Processing: Publish/Subscribe API.

New Apache NiFi ESP Processor

Apache NiFi is a system to automate the flow of data between systems. It also handles back pressure of data and pressure release. You now can set up an Apache NiFi instance to use with SAS Event Stream Processing. For more information, see "Setting Up Apache NiFi to Run with SAS Event Stream Processing" in SAS Event Stream Processing: Advanced Topics.

Enhancements to Windows

- SAS Micro Analytics Services (MAS) integration into SAS Event Stream Processing procedural windows to support Python and DS2 event stream input handlers.
- XML server REST API enhancements for dynamically changing the procedural window's MAS logic for a specified project.
- Source windows are now the only window type that can be declared as insert only. Event stream processing models automatically propagate this property through the data flow.

Product Is Internationalized

SAS Event Stream Processing was internationalized so that it can be ported to locales as required.

Disk Footprint Reduction

The disk space requirements for SAS Event Stream Processing has been reduced. It formerly required several gigabytes of storage; it now requires approximately 700 megabytes.

Support for Upgrades

The migration of models and data that you generated from a previous release of SAS Event Stream Processing is supported on a limited basis. If you plan to import files from SAS Event Stream Processing 3.2 or 4.1, be aware of the following issues:

- Multiple XML elements in SAS Event Stream Processing 4.x have changed since 3.2. You must replace the elements that differ. Opening a legacy project in SAS Event Stream Processing Studio does not automatically upgrade your XML code to a valid format.

  You can use the dfesp_xml_migrate script to migrate your XML code to the 4.x XML schema.
- Review your C++ code that was used with SAS Event Stream Processing 3.2. You must replace the registerMethod_ds2 function with the registerMethod_DS2TS function.
- The default date format of %Y-%m-%d %H:%M:%S for CSV timestamp and datetime fields is no longer valid. The new ESP_DATETIME fields contain a 64-bit integer that represents seconds since UNIX epoch. The new ESP_TIMESTAMP fields contain a 64-bit integer that represents microseconds since UNIX epoch.

  In addition, you can no longer specify an alternative date format when initializing a SAS Event Stream Processing engine. To pass CSV events using an alternative date format, that format must now be specified on the connector or adapter that is the source or sink of CSV data. All connectors and adapters that support CSV include an optional dateformat parameter for this purpose.

Changed XML Elements

Release 3.2 element	Release 4.1/4.2 element
`window-procedural/context-plugin`	`cxx_context_plugin`
`window-procedural/plugin`	`cxx_plugin`
`ds2-code`	`ds2-tableserver`
program code enclosed by a tag	`code` or `code-file`
`ds-code`	`ds-external`
`ds-file`	`code` or `code-file`
`dateformat` within an `engine`	removed
`left-fields`	`left-expr`
`right-fields`	`right-expr`

Changed Function

Review C++ code that you have used with SAS Event Stream Processing 3.2. You must replace the function `registerMethod_ds2` with the function `registerMethod_DS2TS`.

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