Hortonworks Streaming Analytics Manager 3

Building a SAM Application

Date of Publish: 2018-11-15

https://docs.hortonworks.com/

Contents

Building an Application

Prerequisites

- You have integrated SAM
- You have set up appropriate environments and service pools

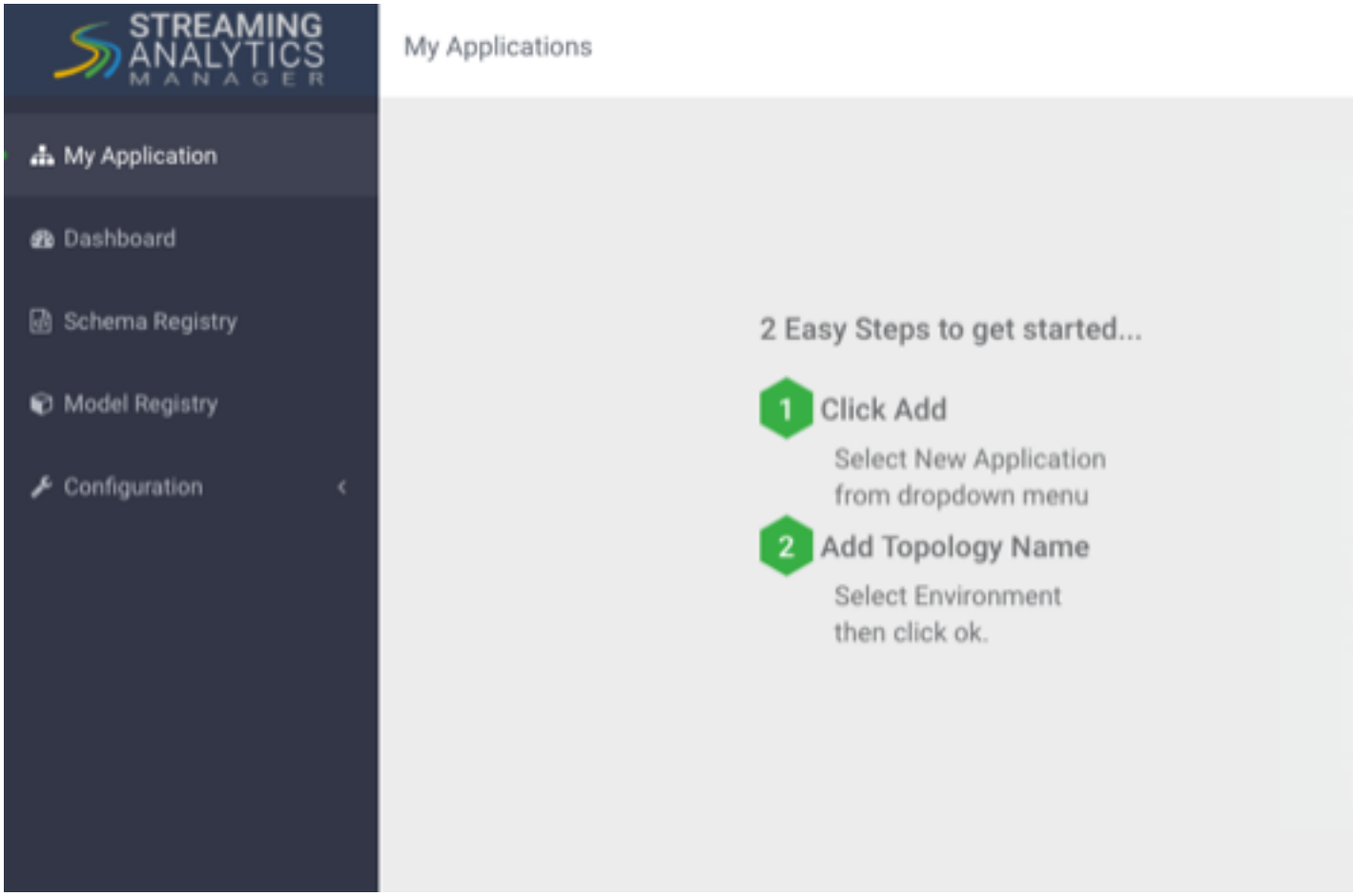
Launch the Stream Builder UI

Procedure

1. In Ambari, select **Streaming Analytics Manager** from the left-hand **Services** pane.
2. Under **Quick Links**, select **SAM UI**.

Results

The SAM Stream Builder UI displays. You can return at any time by clicking **My Applications** from the left-hand menu.



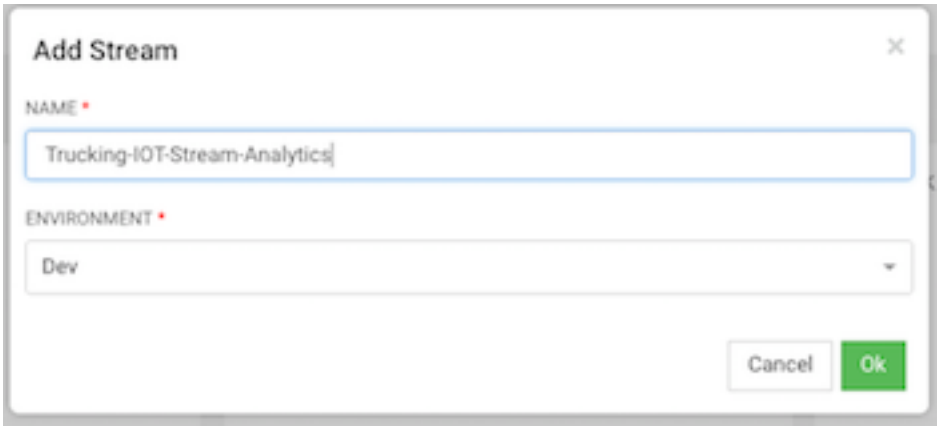
Add a New Stream Application

Procedure

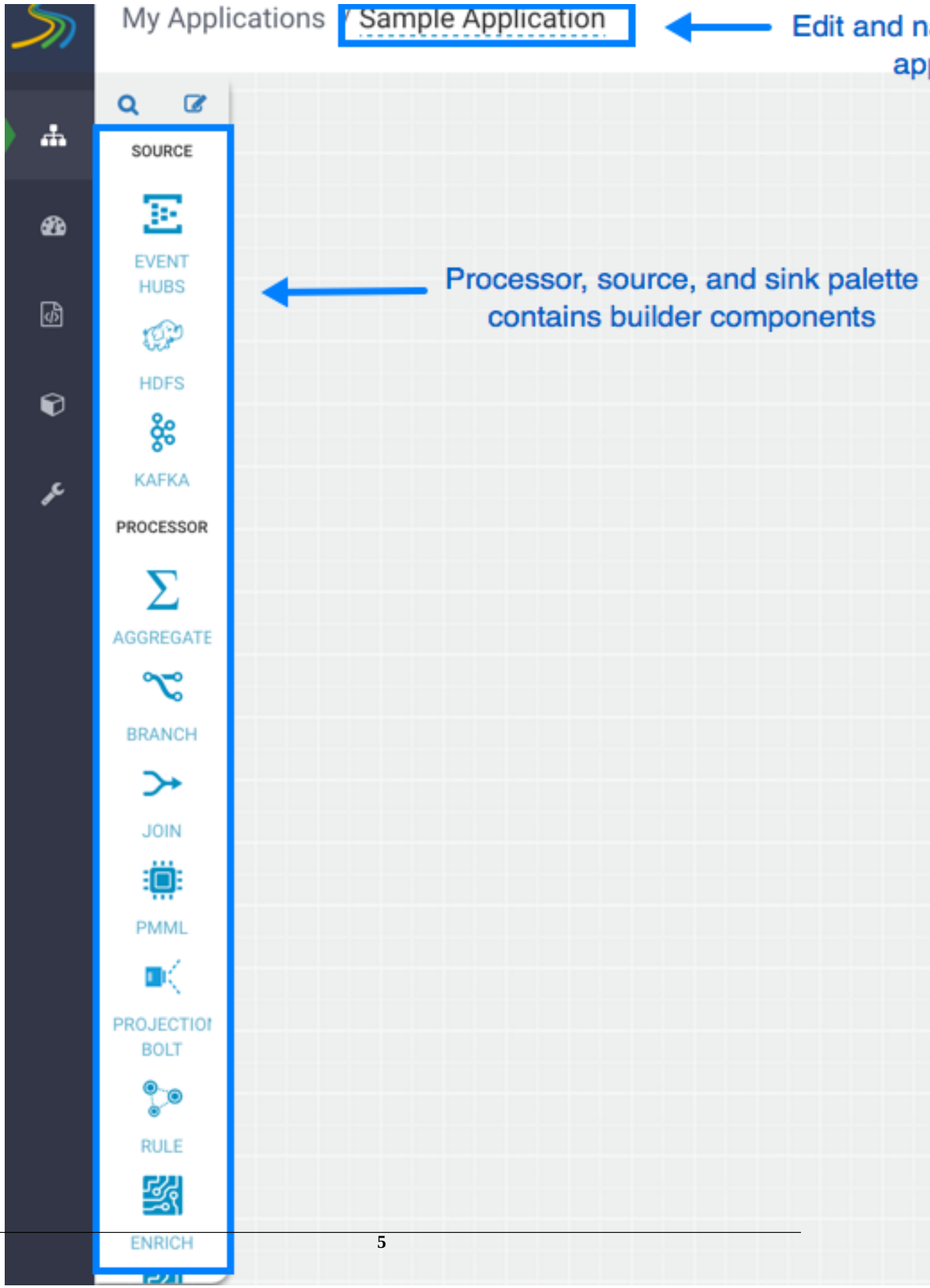
1. Specify the name of the stream application and the environment you want to use.

   Note:

   The name of the stream app should not have any spaces.

2. SAM displays the Stream Builder canvas. Builder components on the canvas palette are the building blocks you use to build stream apps. Refer to the *HDF Overview* for information about each component building block.


My Applications
Sample Application
Edit and n
ap
SOURCE
EVENT HUBS
HDFS
KAFKA
PROCESSOR
AGGREGATE
BRANCH
JOIN
PMML
PROJECTIOI
BOLT
RULE
ENRICH
Processor, source, and sink palette contains builder components

Add a Source

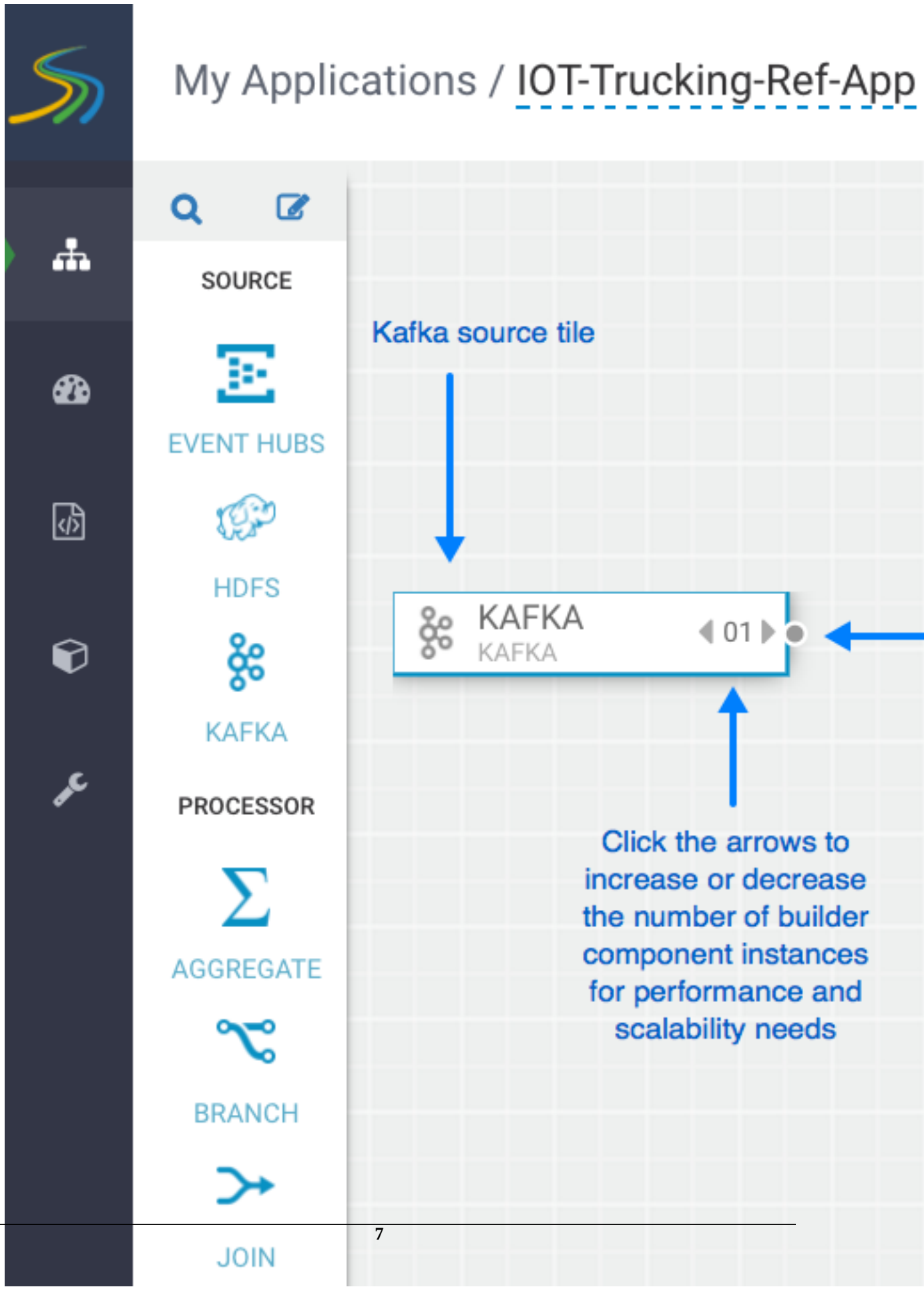
As described in the *HDF Overview*, Stream Builder offers four types of builder components: sources, processors, sinks, and custom components. Start building your application by adding a source.

Before you begin

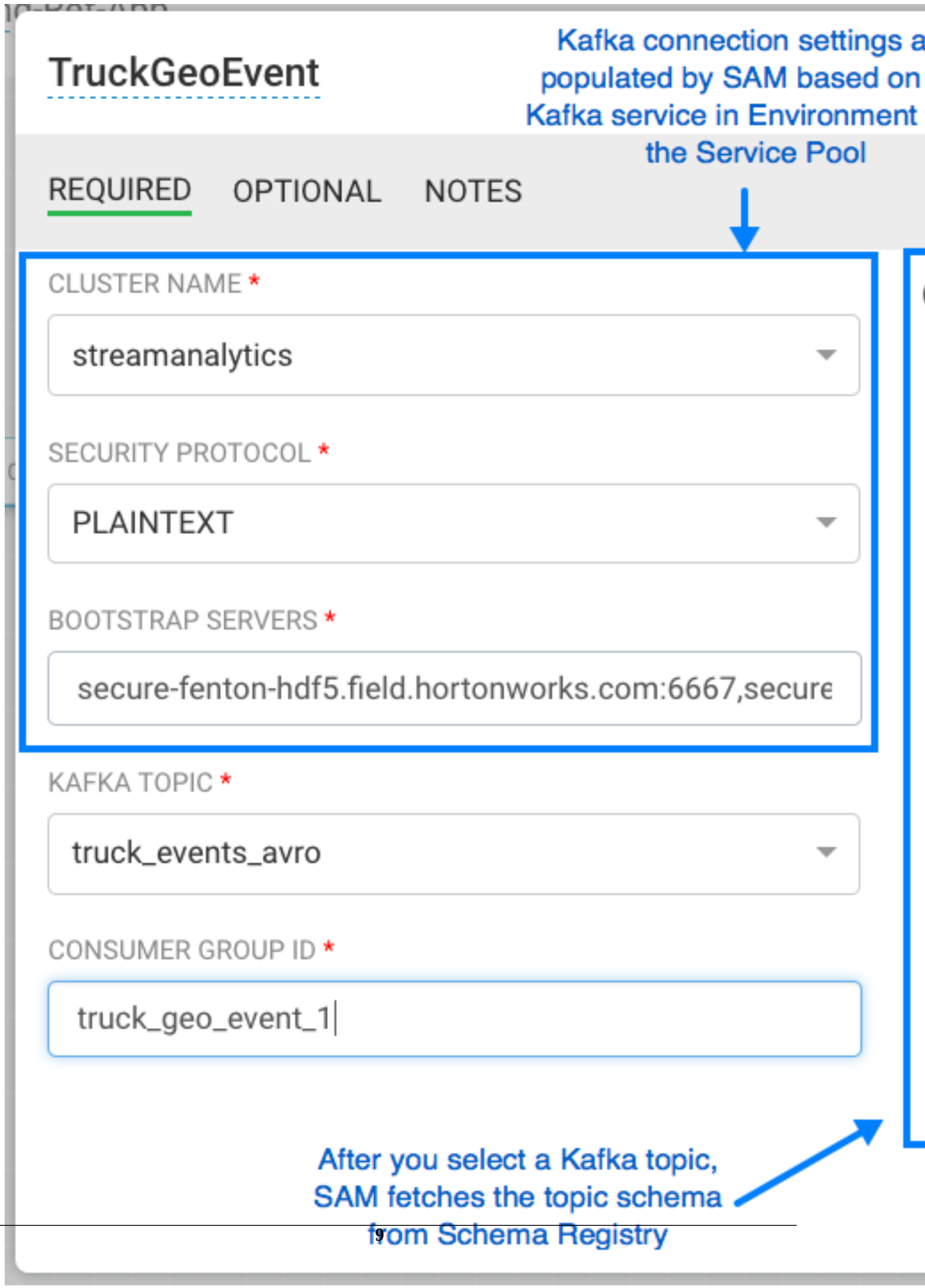
You have configured Schema Registry and integrated with SAM.

Procedure

1. Drag a source builder component, Kafka for example, onto the canvas. This creates a Kafka tile component:


My Applications / IOT-Trucking-Ref-App
SOURCE
EVENT HUBS
HDFS
KAFKA
PROCESSOR
AGGREGATE
BRANCH
JOIN
Kafka source tile
KAFKA
KAFKA
01
Click the arrows to increase or decrease the number of builder component instances for performance and scalability needs

2. Double-click the tile to begin configuring Kafka. After you specify a Kafka topic name, SAM communicates with Schema Registry and displays the schema:


TruckGeoEvent
Kafka connection settings a
populated by SAM based on
Kafka service in Environment
the Service Pool
REQUIRED
OPTIONAL
NOTES
CLUSTER NAME *
streamanalytics
SECURITY PROTOCOL *
PLAINTEXT
BOOTSTRAP SERVERS *
secure-fenton-hdf5.field.hortonworks.com:6667,secure
KAFKA TOPIC *
truck_events_avro
CONSUMER GROUP ID *
truck_geo_event_1
After you select a Kafka topic,
SAM fetches the topic schema
from Schema Registry

3. Add the additional components you want to use to develop your stream app.

Results

When you have added and correctly configured your stream app components, the component tile displays a green dot on the left. You cannot connect a source to different processors or sinks until it is correctly configured.

Connect Components

Once you have added and configured your source, add additional processors and sinks to the canvas. To pass a stream of events from one component to the next, create a connection between the two components. In addition to defining data flow, connections allow you to pass a schema from one component to another.

Before you begin

You have added and configured at least one source.

Procedure

1. Click the green dot to the left of your source component.

2. Drag your cursor to the component tile to which you want to connect.

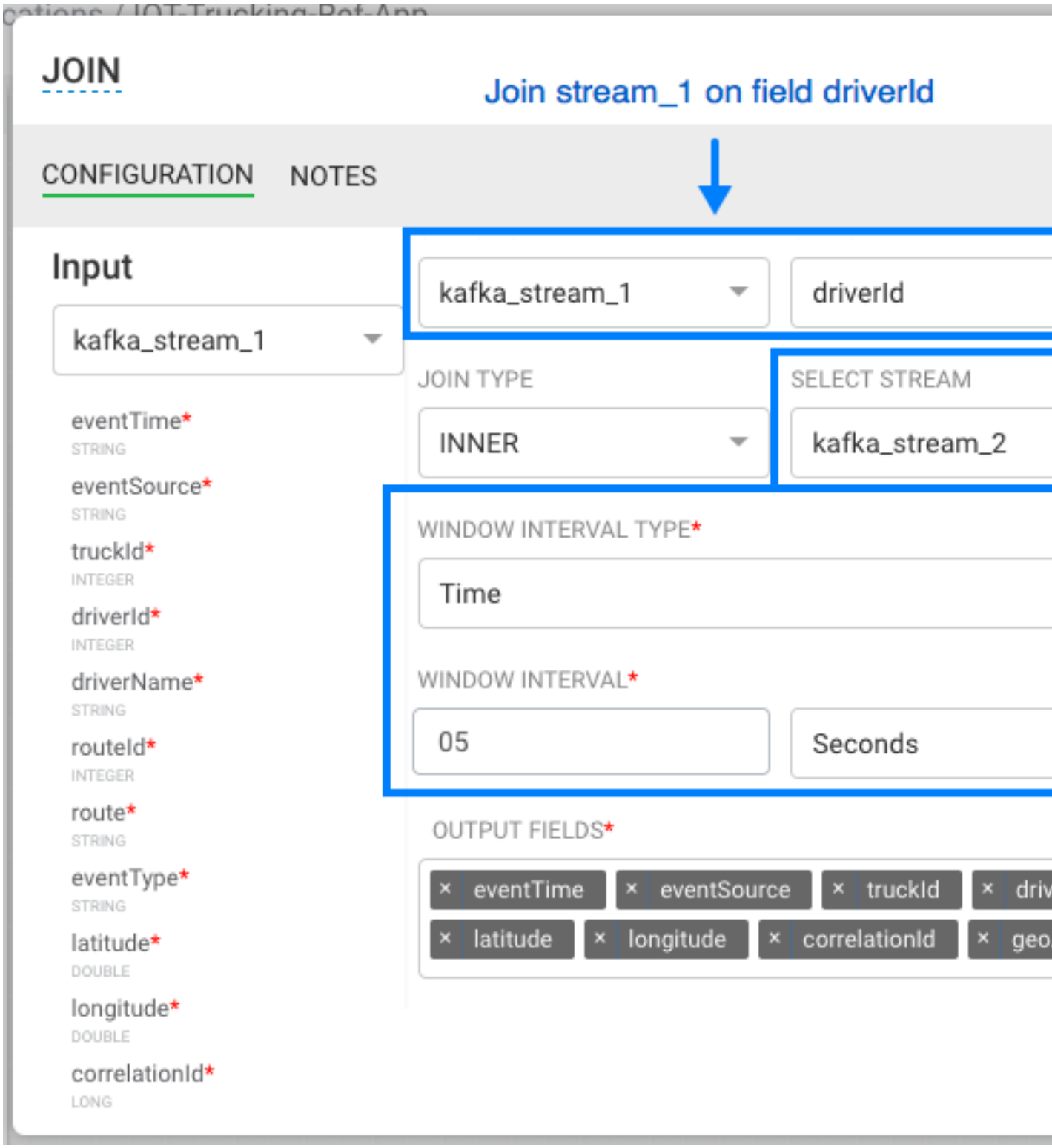
Join Multiple Streams

Joining multiple streams is an important SAM capability. You accomplish this by adding the Join processor to your stream application.

Procedure

1. Drag a Join processor onto your canvas and connect it to a source.
2. Double click the Join tile to open the **Configuration** dialog.
3. Configure the Join processors according to your streaming application requirements.

Example

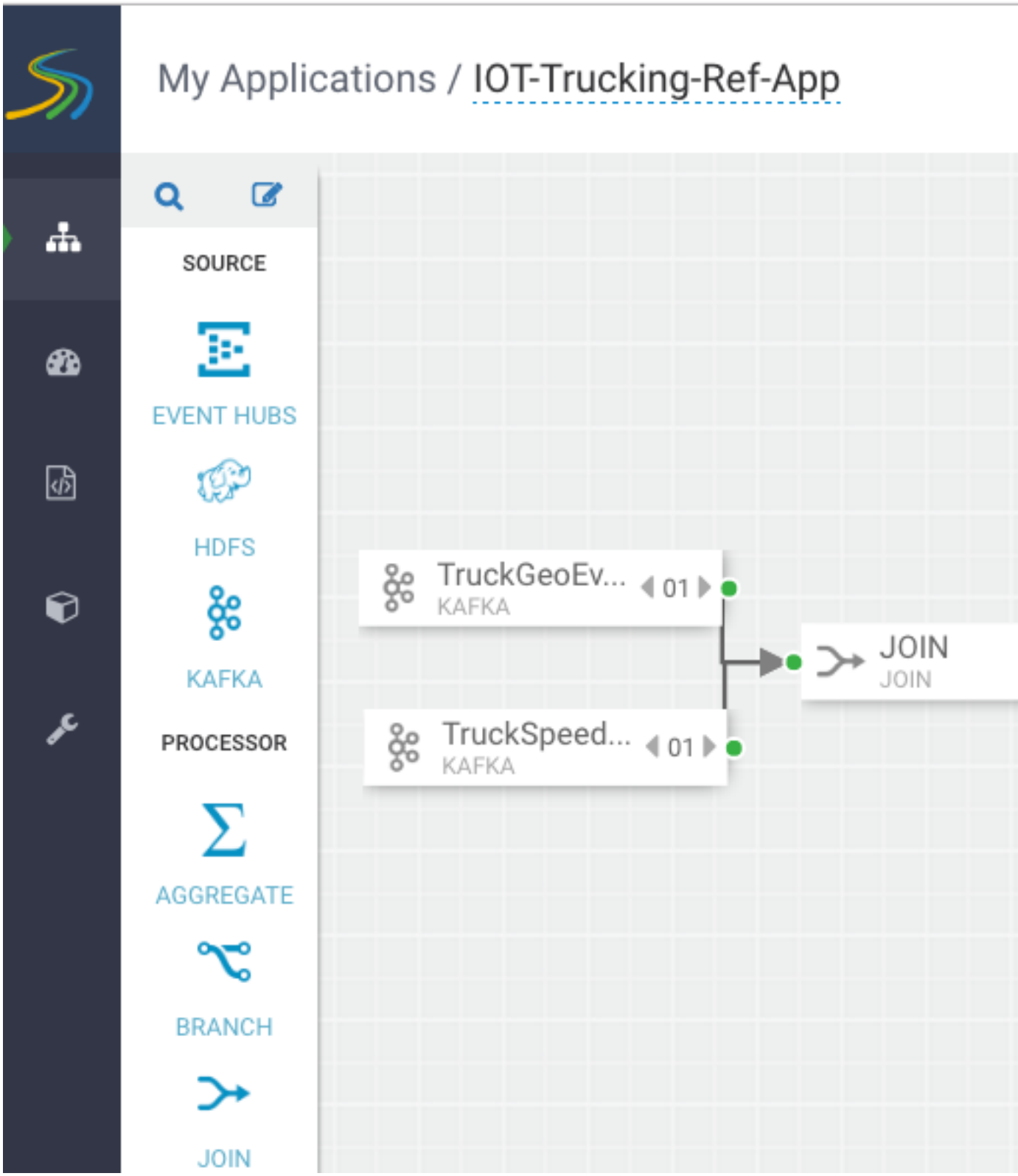


Filter Events in a Stream

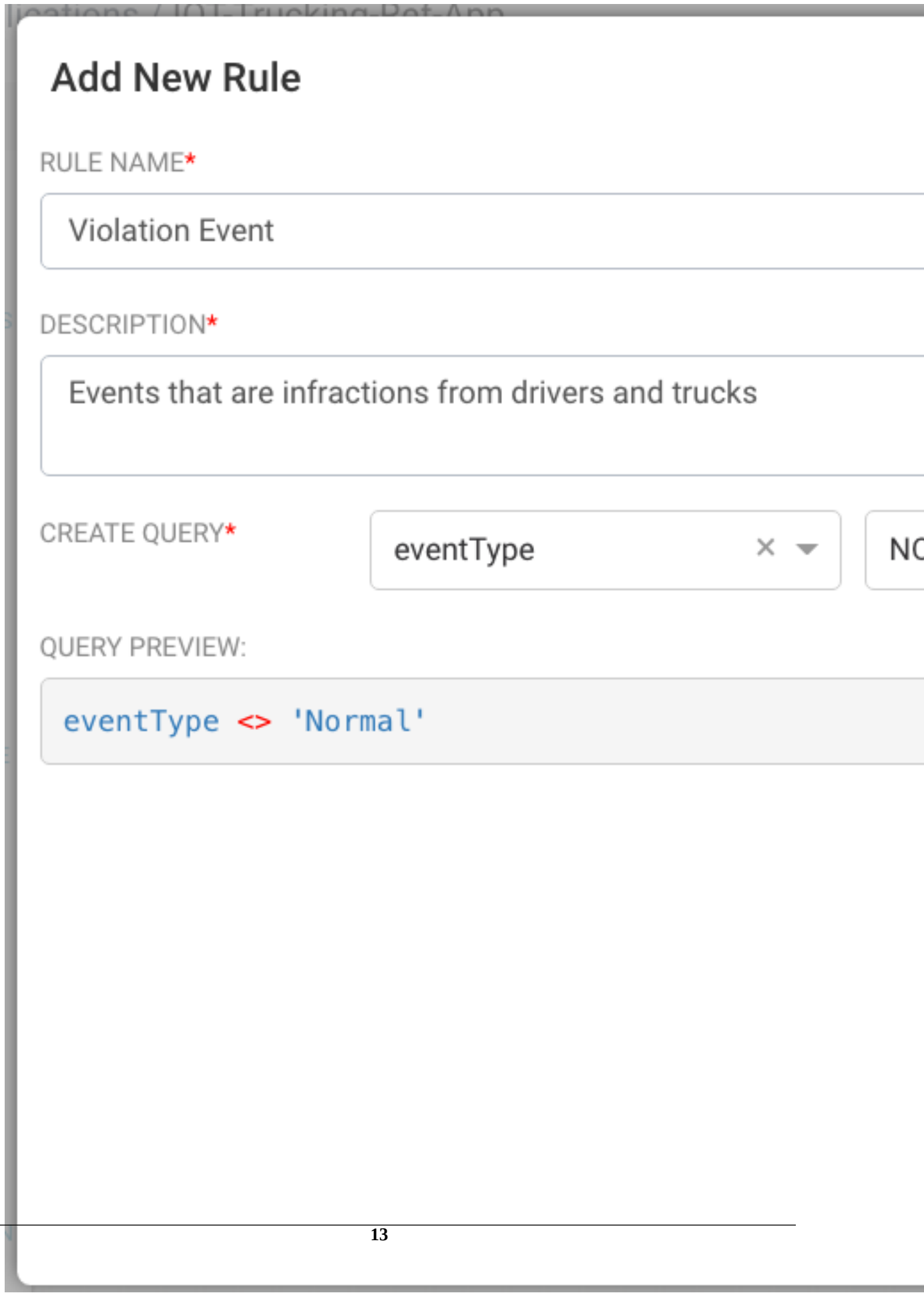
You can use SAM to filter events in the stream. You accomplish this by using Rule processor, which translates rules into SQL queries that operate on the stream of data.

Procedure

1. Drag the Rule processor to the canvas and connect it to the Join processors.

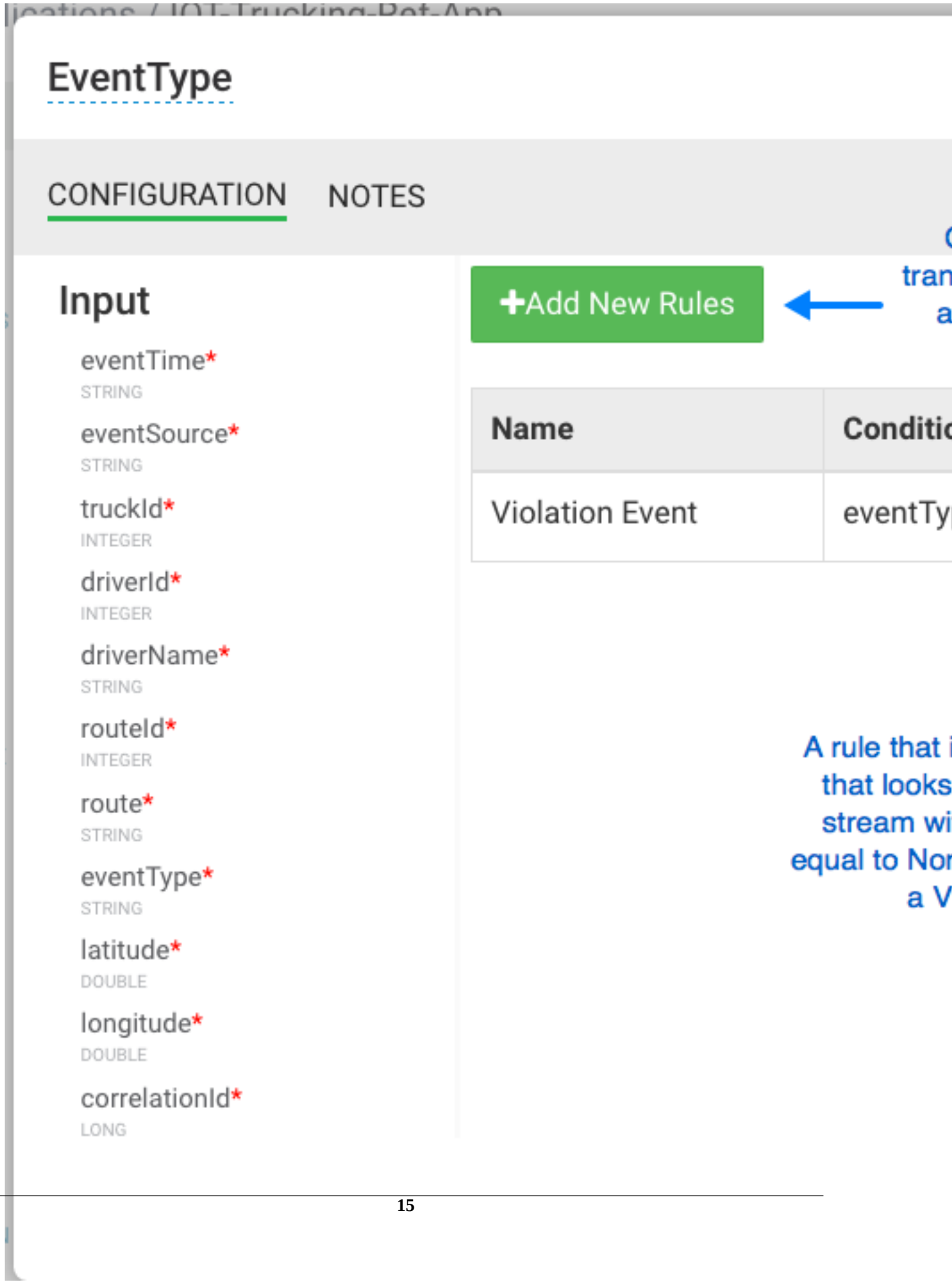


2. Double click the Rule processor, click the **+ Add New Rules** button, and create a new rule:


Add New Rule
RULE NAME*
Violation Event
DESCRIPTION*
Events that are infractions from drivers and trucks
CREATE QUERY*
eventType
QUERY PREVIEW:
eventType <> 'Normal'

3. Click **Ok** to save the new rule.

Example


EventType
CONFIGURATION
NOTES
Input
eventTime*
STRING
eventSource*
STRING
truckId*
INTEGER
driverId*
INTEGER
driverName*
STRING
routeId*
INTEGER
route*
STRING
eventType*
STRING
latitude*
DOUBLE
longitude*
DOUBLE
correlationId*
LONG
+Add New Rules
Name
Violation Event

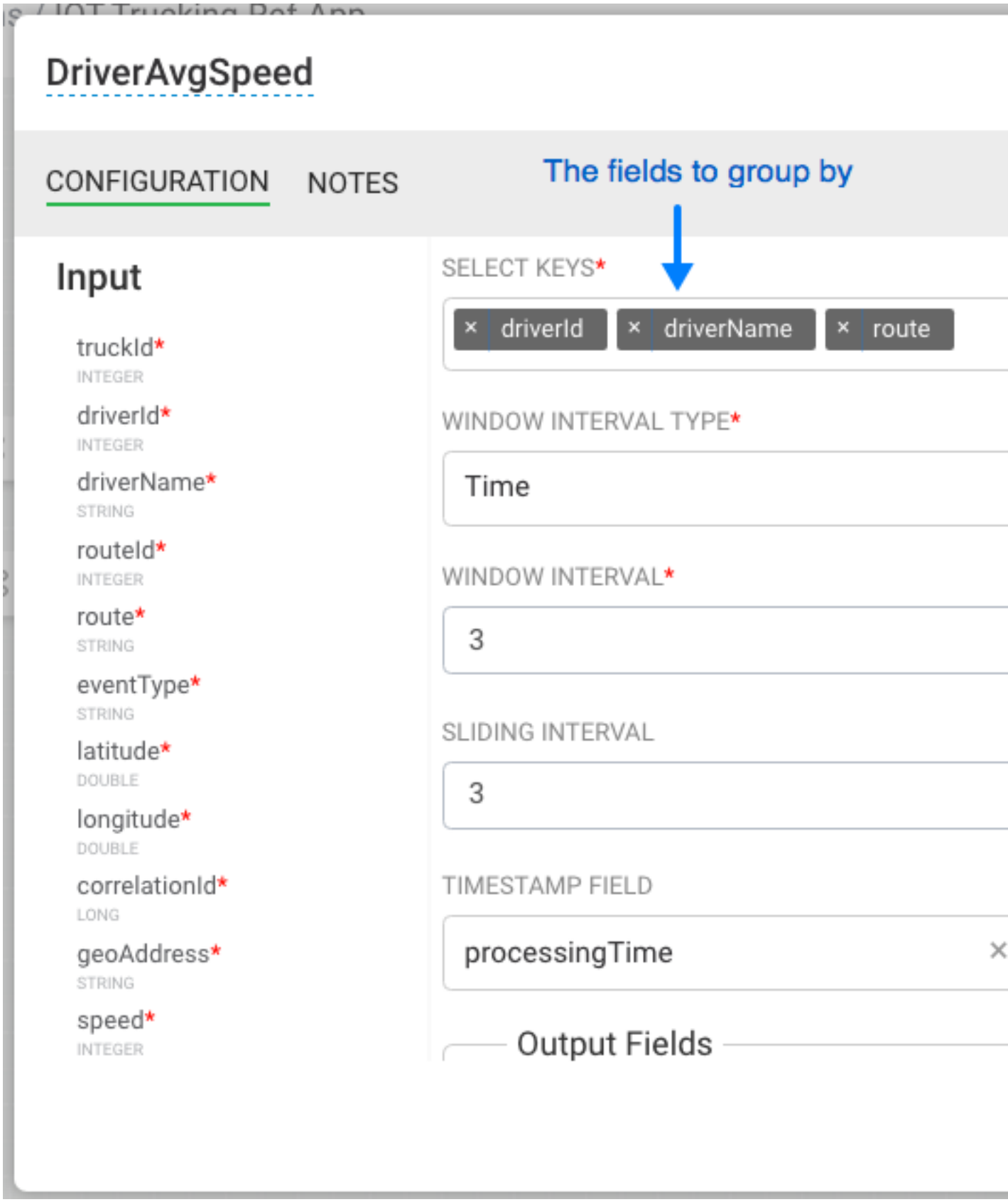
Use Aggregate Functions over Windows

Windowing is the ability to split an unbounded stream of data into finite sets based on specified criteria such as time or count, so that you can perform aggregate functions (such as sum or average) on the bounded set of events. In SAM, you accomplish this using the Aggregate processor. The Aggregate processor supports two window types, tumbling and sliding windows. You can create a window based on time or count.

Procedure

1. Drag the Aggregate processor to the canvas and connect it to the stream application you are building.
2. Double click the Aggregate tile to configure it according the your stream application requirements.

Example

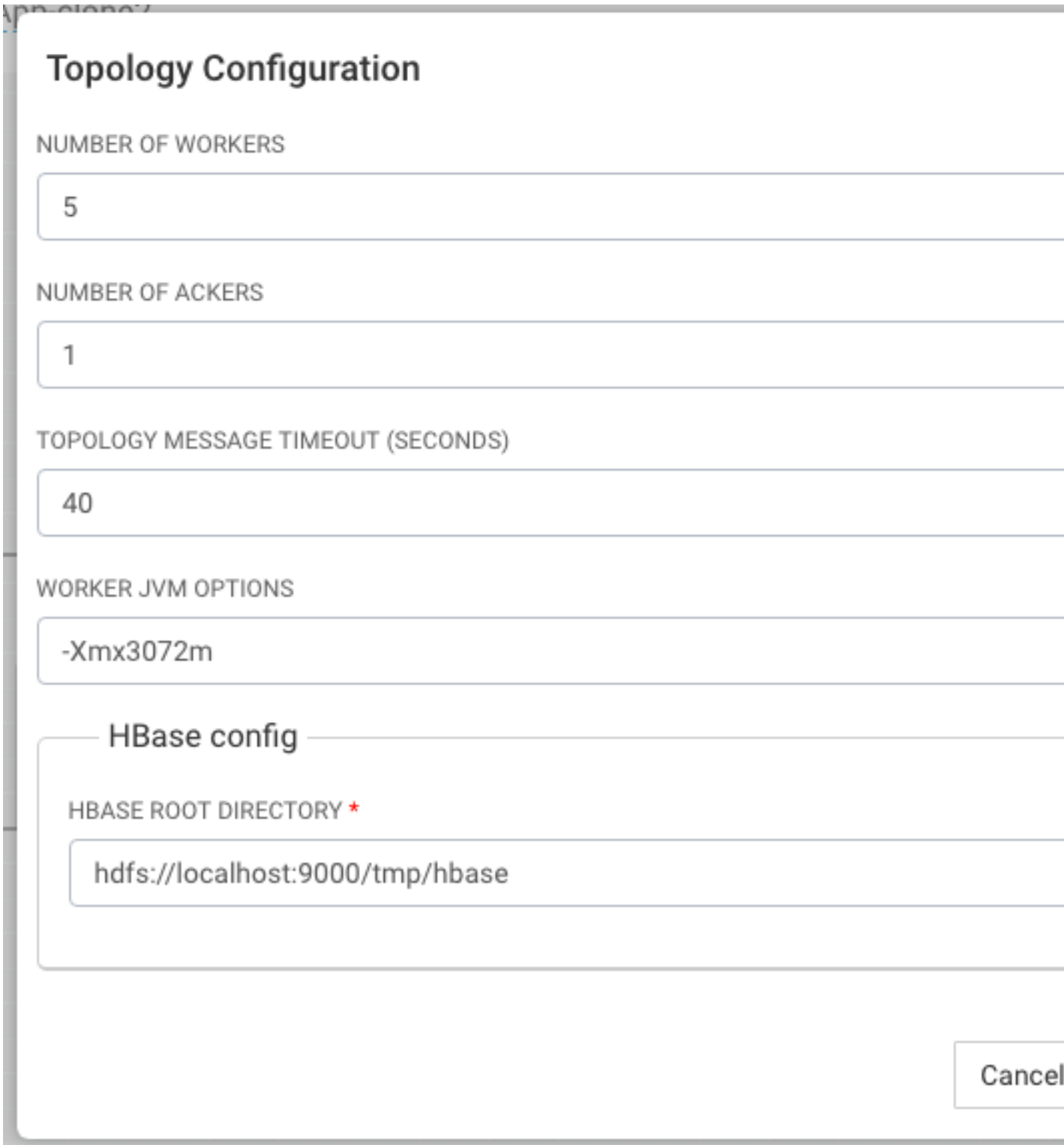

DriverAvgSpeed
CONFIGURATION
NOTES
The fields to group by
Input
truckId*
INTEGER
driverId*
INTEGER
driverName*
STRING
routeId*
INTEGER
route*
STRING
eventType*
STRING
latitude*
DOUBLE
longitude*
DOUBLE
correlationId*
LONG
geoAddress*
STRING
speed*
INTEGER
SELECT KEYS*
driverId
driverName
route
WINDOW INTERVAL TYPE*
Time
WINDOW INTERVAL*
3
SLIDING INTERVAL
3
TIMESTAMP FIELD
processingTime
Output Fields

Deploying a Stream App

Configure Deployment Settings

Before deploying the application, it is important to configure deployment settings such as JVM size, number of ackers, and number of workers.

Because this topology uses a number of joins and windows, you should increase the JVM heap size for the workers. Click the gear icon on the top right corner of the canvas, and increase the number of workers (e.g.: 5) and increase the JVM heap memory (-Xmx3072m).



Deploy the App

After the app's deployment settings has been configured, click the Deploy button on the lower right of the canvas. During the deployment process, Streaming Analytics Manager completes the following tasks:

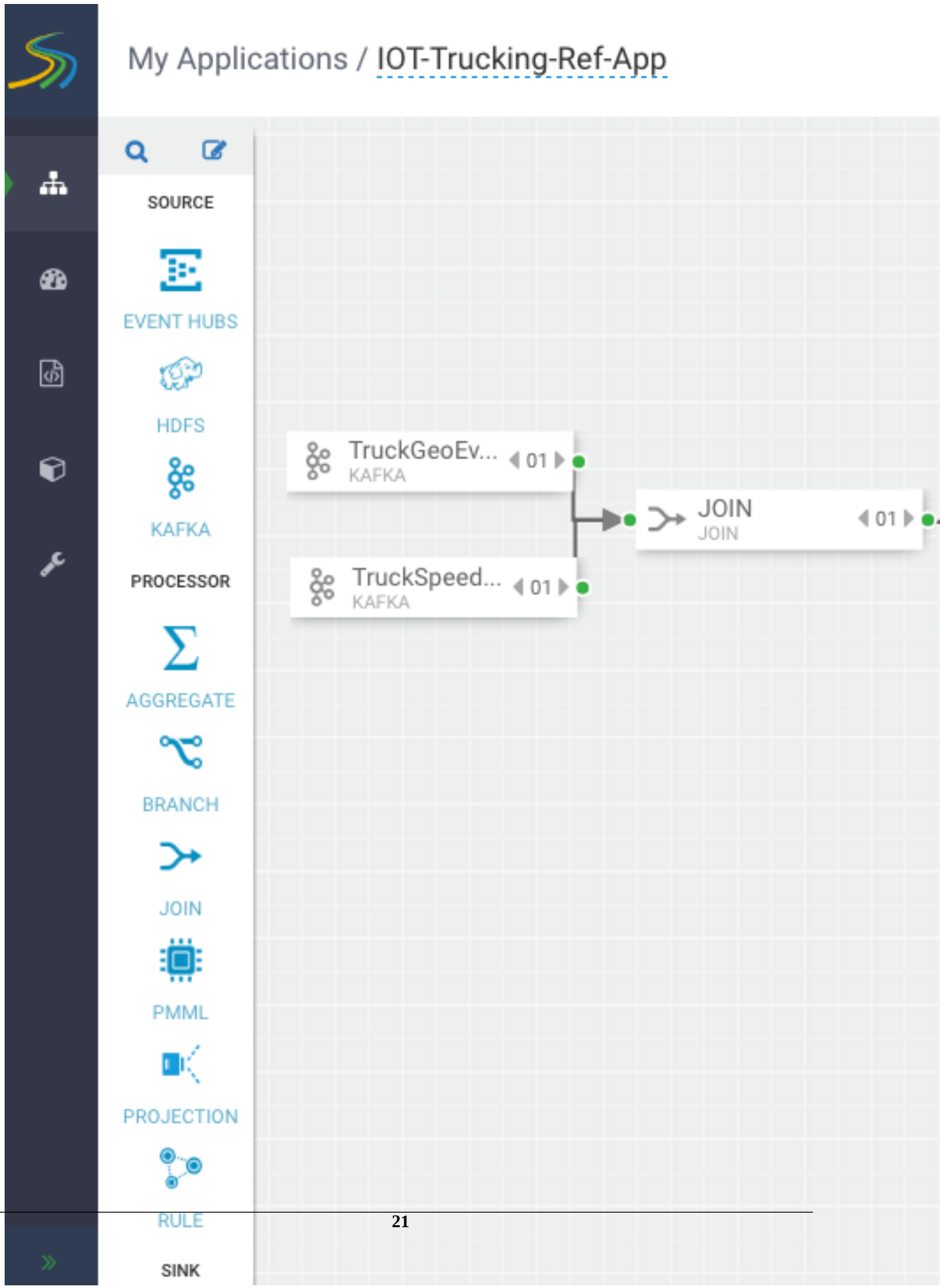
Procedure

1. Construct the configurations for the different big data services used in the stream app.

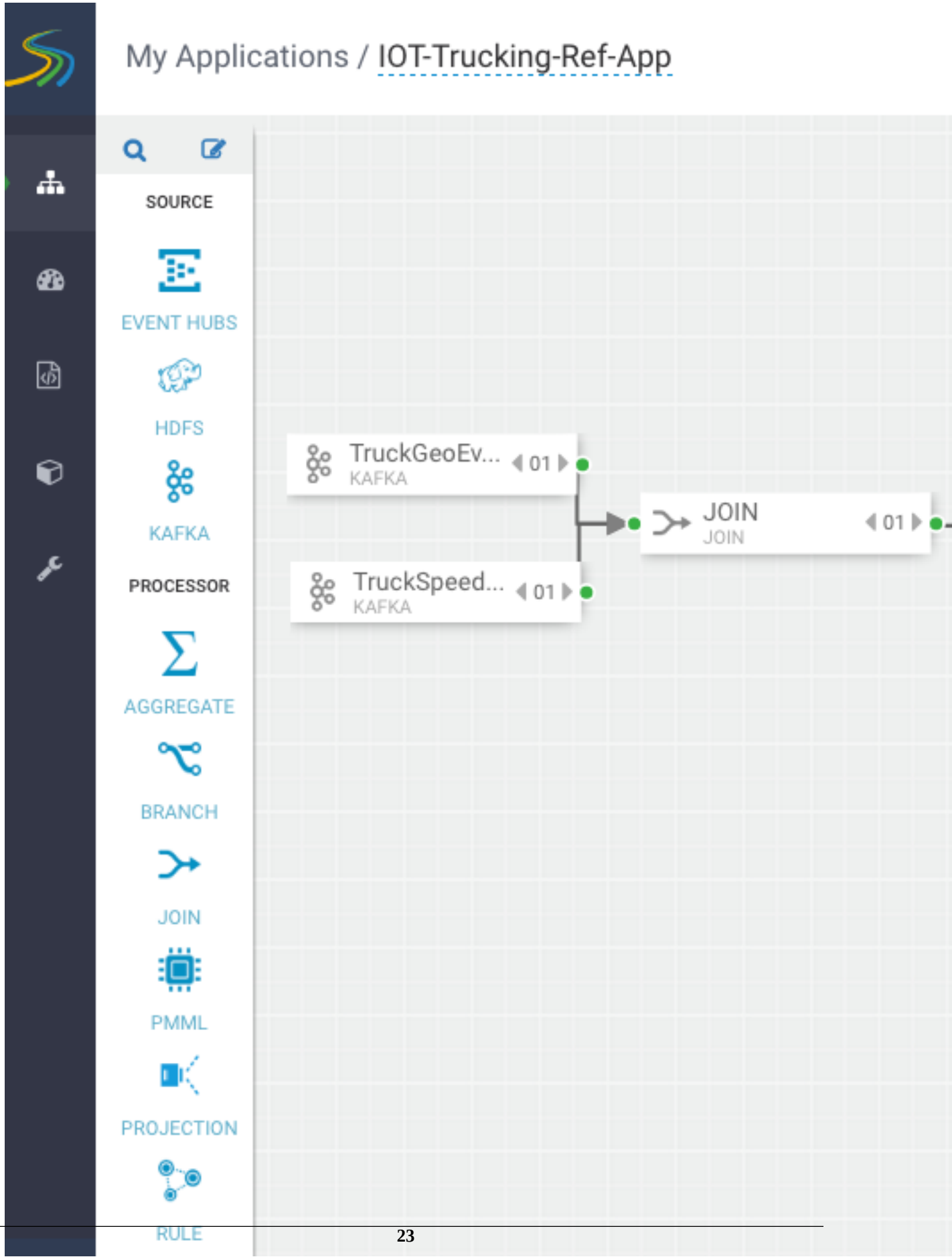
2. Create a deployable jar of the streaming app.
3. Upload and deploy the app jar to streaming engine server.

Results

The stream app is deployed to a Storm cluster based on the Storm Service defined in the Environment associated with the app.


My Applications / IOT-Trucking-Ref-App
SOURCE
EVENT HUBS
HDFS
KAFKA
PROCESSOR
AGGREGATE
BRANCH
JOIN
PMML
PROJECTION
RULE
SINK
TruckGeoEv...
KAFKA
01
TruckSpeed...
KAFKA
01
JOIN
JOIN
01

After the application has been deployed successfully, Streaming Analytics Manager notifies you and updates the status to Active, as shown in the following diagram.


My Applications / IOT-Trucking-Ref-App
SOURCE
EVENT HUBS
HDFS
KAFKA
PROCESSOR
AGGREGATE
BRANCH
JOIN
PMML
PROJECTION
RULE
TruckGeoEv...
KAFKA
01
TruckSpeed...
KAFKA
01
JOIN
JOIN
01