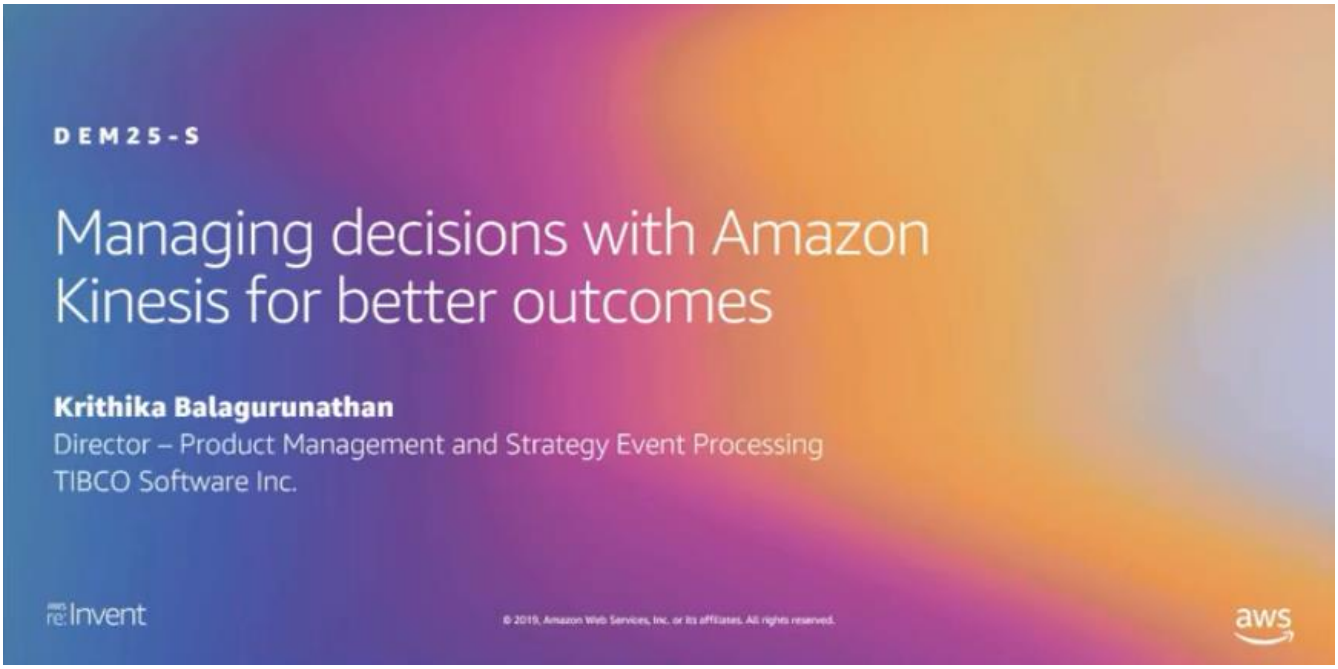


Systems like Apache Kafka, Amazon Kinesis, and Amazon MSK are great for the ingestion, delivery, and real-time analysis of streaming data. Adding a rules engine that detects patterns of events occurring in many systems enables organizations to support a much wider set of use cases. Rules engines also abstract the complexity of defining rules, empowering business users to leverage context alongside their expertise to define the next best action. In this session, learn how to combine the power of Apache Kafka, Amazon Kinesis, or Amazon MSK with business rules engines to automate sophisticated decision-making and actions. This presentation is brought to you by TIBCO Software, an APN Partner.

With traditional data processing, responses are delivered after the fact

Data is collected and stored

Data is placed in a persistent data store (Relational DB, NoSQL, or Hadoop environment)

Analytical processes are executed

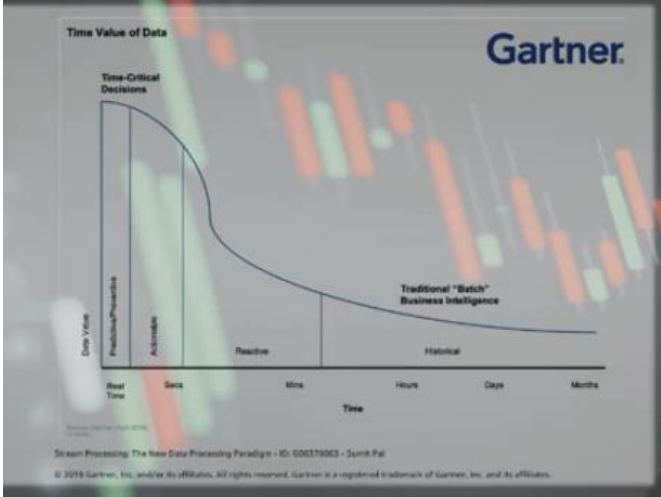
Analysis is performed on the stored data to detect opportunities or threats

Actions are identified

Once actions are identified, they are delivered and executed across various business channels

You cannot make today's decisions based on yesterday's information!

Decisions are more valuable immediately after an event occurs



As time passes, **events tend to lose their value**

Opportunity to predict a failure is missed

Customer is no longer interacting with your organization

Real-time capability is needed to maximize event value

The way applications are built needs to change

From Deterministic

- Everything was a deterministic set of rules
- Predetermined procedural logic (If, Else)

To Smart

- Software needs to become both predictive and prescriptive
- Understand context and respond accordingly

Machine learning is an answer, but not the only answer

Event Stream Processing

- Sometimes the real-time processing of events is sufficient for your problem!
- Simplifies definition of the decisions
  - Declarative rules
  - Median, mean, time-weighted averages, variability/robustness

Machine Learning

- Classify large quantities data, such as images, text, etc.
- Broad set of patterns needs to be detected
- Sufficient data must be available

Project Flogo

Project Flogo

flogo.io

Open-Source Ecosystem for Event-Driven Applications

10–50x lighter than Java, .NET, or Node.js

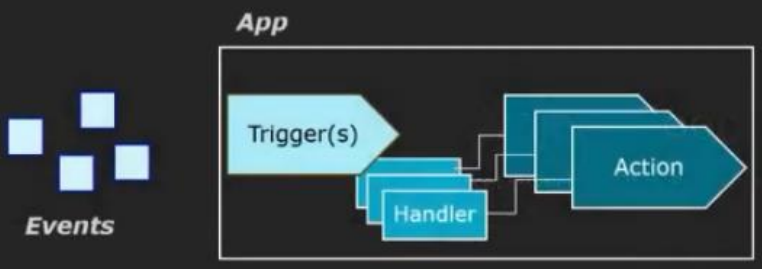
100% open-source stack for all things event-driven

Common core for all event-driven capabilities

Deploy as serverless functions, containers, or to IoT edge devices

Machine learning

Flogo constructions: Triggers, handlers & actions



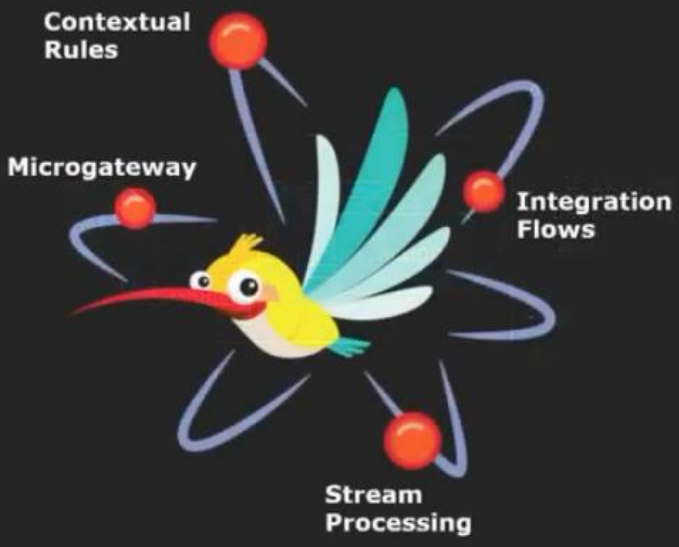
App = *Trigger(s) + Actions (Activities)*

Triggers
- Receive data from external sources
- Are managed by a configurable threading model
- Have a common interface enabling anyone to build a Flogo trigger

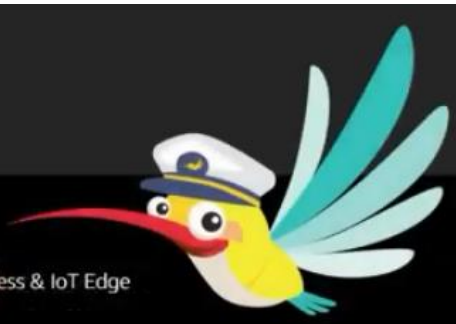
Handlers
- Dispatch events consumed by triggers

Actions
- Process events in a manner suitable with the implementation
- Have a common interface enabling unique event processing capabilities

The Project Flogo ecosystem



Flogo Core



Event-Driven Application Kernel for Serverless & IoT Edge

Powerful event-driven programming model based on **triggers** and **actions**

Internal channel for action chaining; bundle all application needs into a single bin

Common contribution model enabling you to leverage 100s of activities & triggers

Simple interface to extend event processing capabilities

Flogo Streams

Stream Pipeline for Edge & Cloud-Native

Lightweight stream process for edge devices

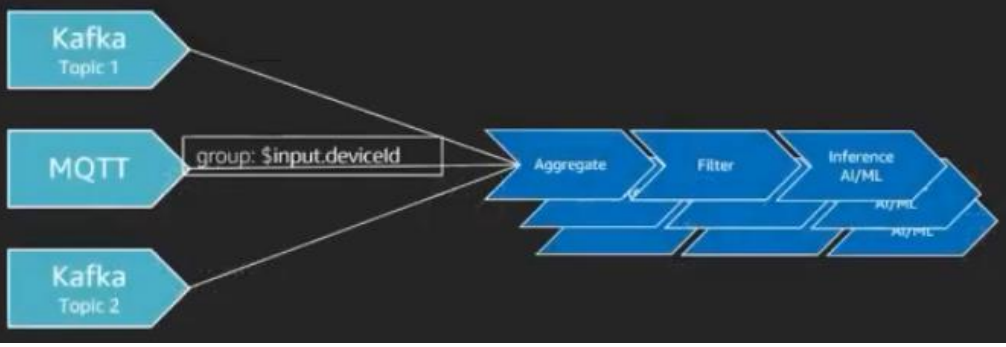
f(x) Aggregation capabilities

Join streams from multiple event sources

Filter out the noise

Grouping & joining events across triggers

- With Flogo Streams, you can group and join events across multiple streams of data
- Joins occur against pipeline input/output



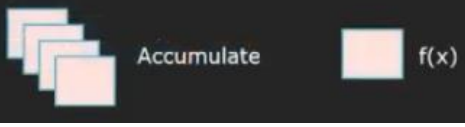
Aggregation

Operations

- Tumbling
- Time Tumbling
- Sliding
- Time Sliding

Functions

- avg, sum, min, max, count, accumulate




Flogo Rules
Real-Time Contextual Decisioning
Real-time decisions to determine next best action/outcome and experience
Open source/core complete with extensions, APIs, and interfaces
Declarative rules/rapid application development
Stateful/contextual reasoning across time and space


Native Machine Learning
Embed Machine Learning into Your Real-Time Applications
Execute TensorFlow models
100% open source with zero lock-in

Real-time data transformations for ML should be easy

- 80%* of data science is data cleaning—production has to replicate this
- Data scientists and developers receive different starting data
- Developers aren't trained for feature creation
- Tools for pre/post-processing data in production unaddressed

*Commonly used made-up number

CatalystML

Real-time data transformations for machine learning

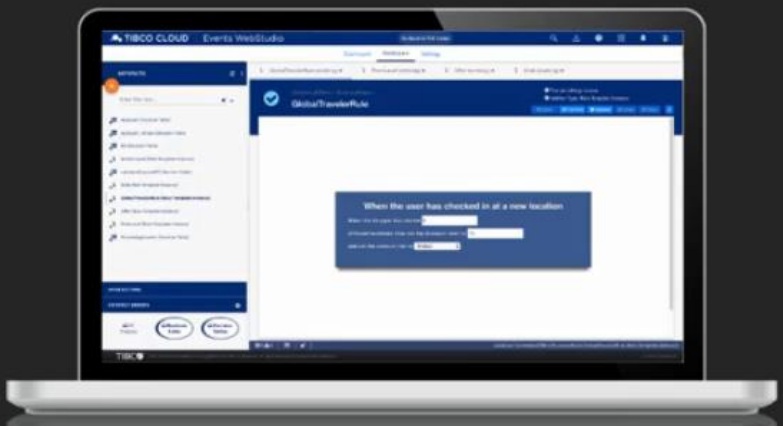
More than 85 mathematical transformations

Language agnostic

Support for 1:1 mapping into ML models

These capabilities are also available on AWS

TIBCO Cloud Events:
Reduce decision latency by turning streaming data into actions to mitigate risk and improve customer experiences or business operation

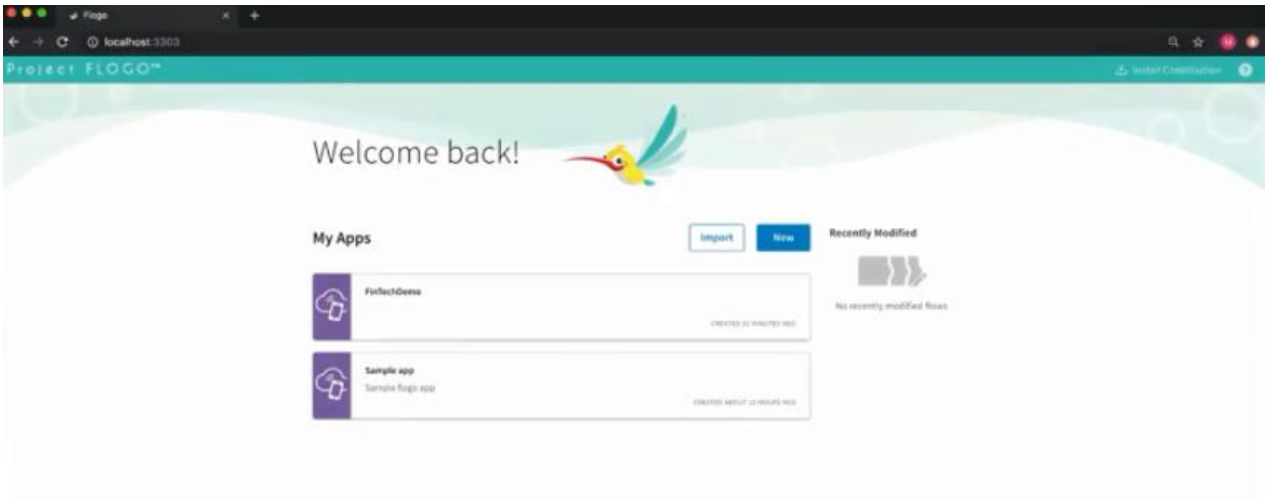


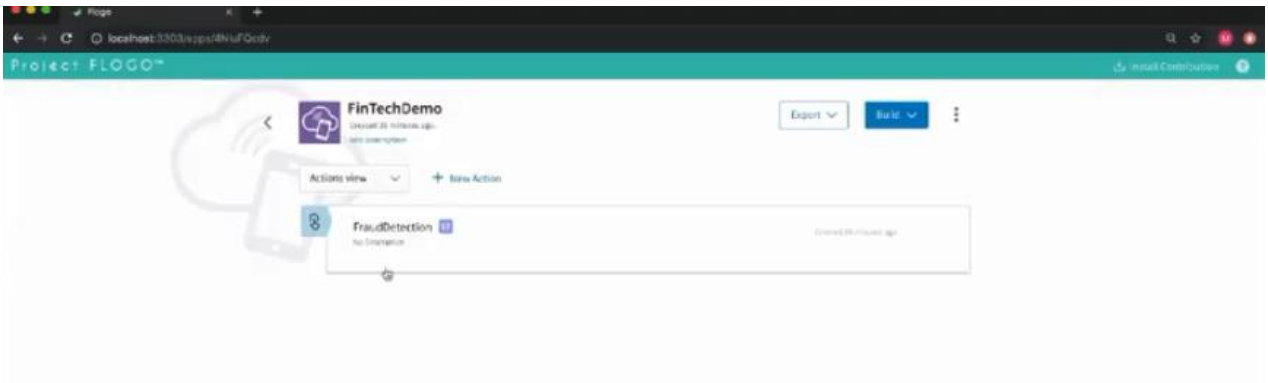
Web-based rules authoring to empower the business user

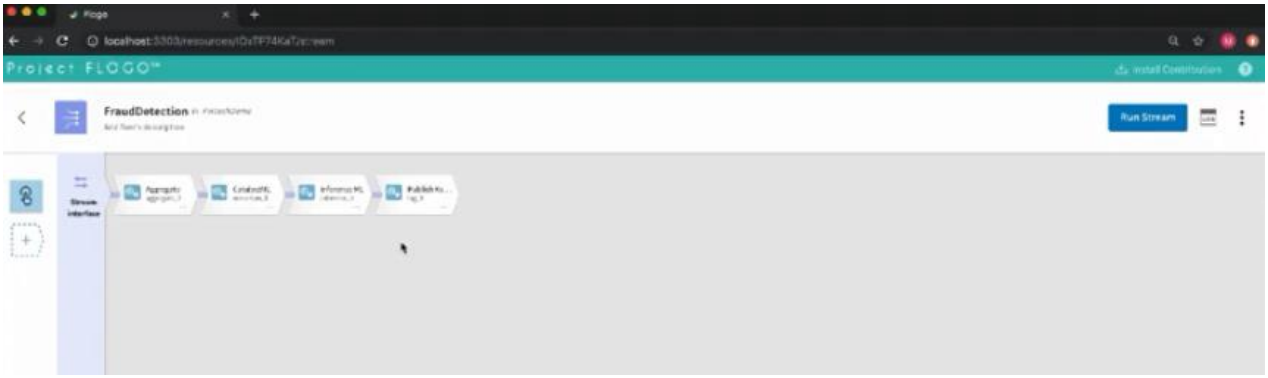
Declarative rules simplify business logic

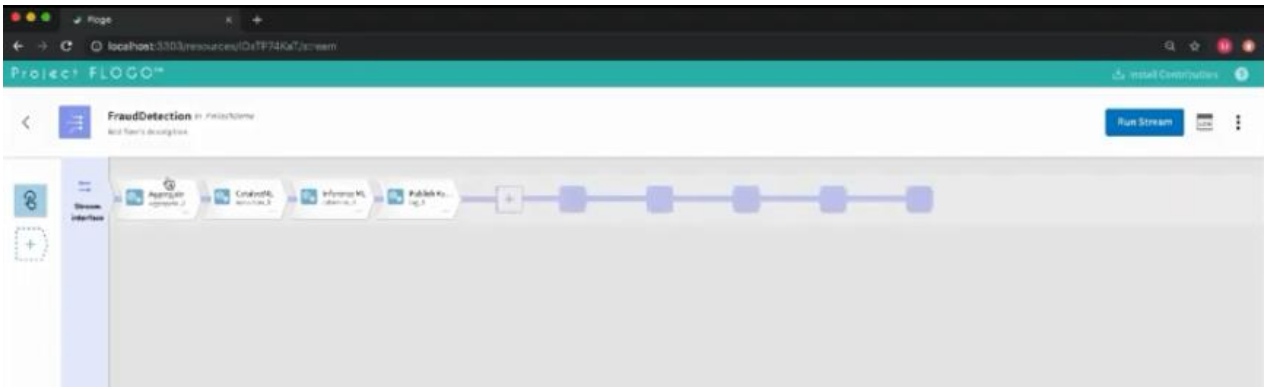
Brings real-time decisions to TIBCO Cloud

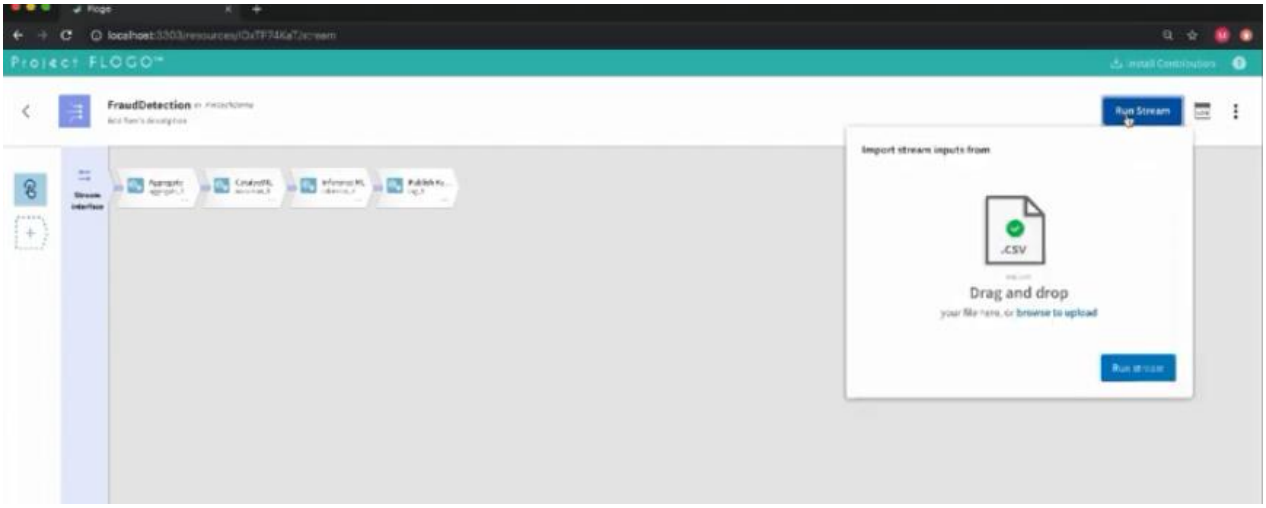
Video

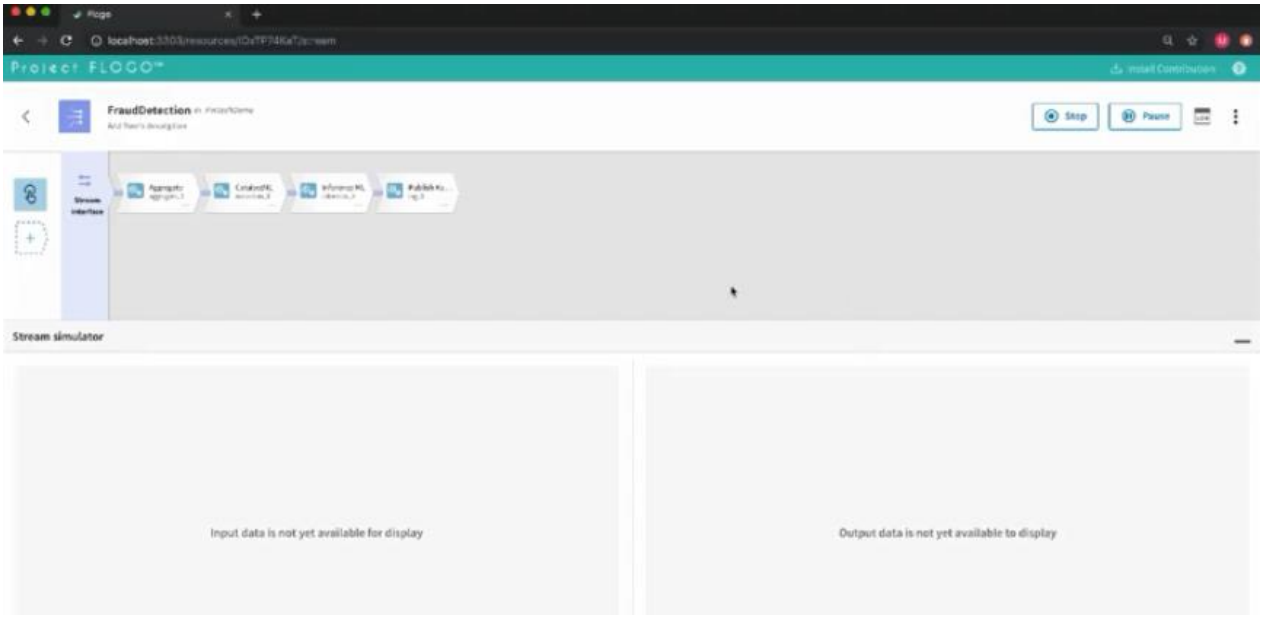

Project FLOGO™
Welcome back!
My Apps
Import
New
Recently Modified
FinTechDemo
Sample app

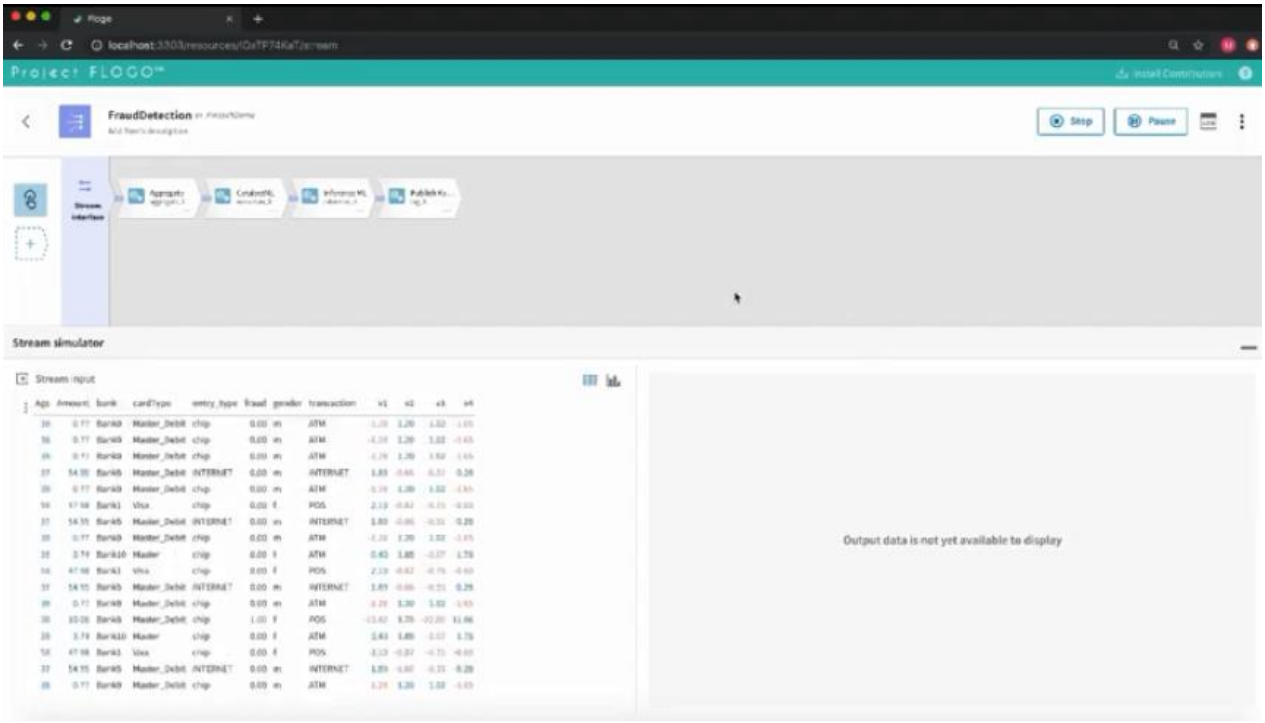

Project FLOGO™
FinTechDemo
Export
Build
Actions view
New Action
FraudDetection

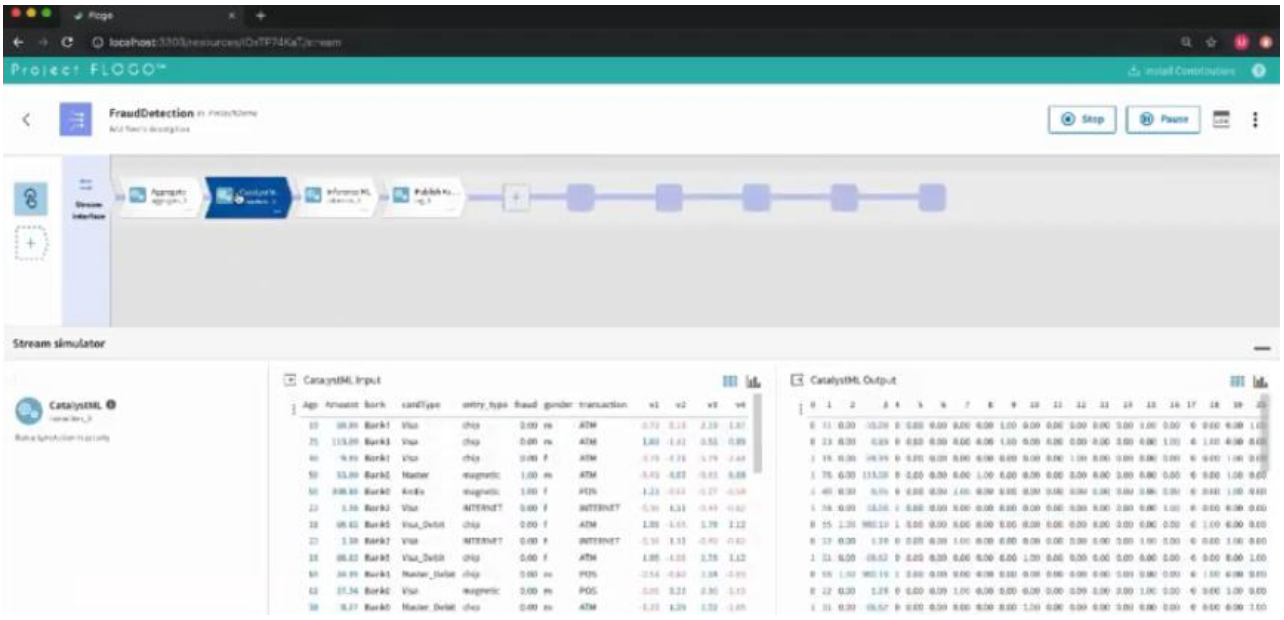

Project FLOGO™
FraudDetection
Run Stream

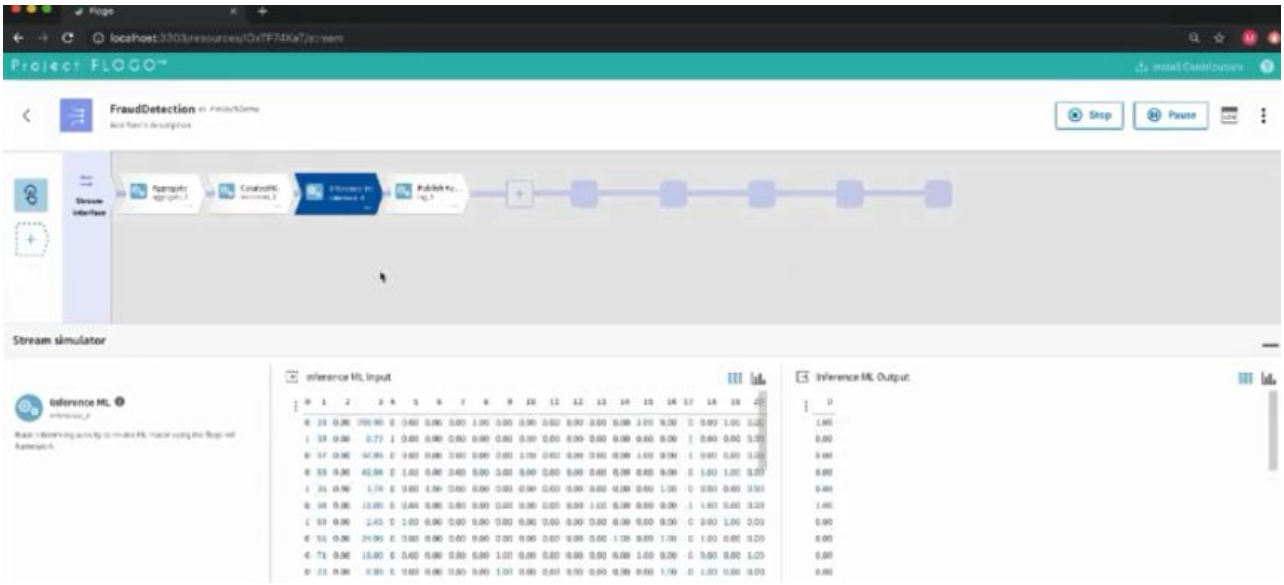

Project FLOGO™
FraudDetection
Run Stream

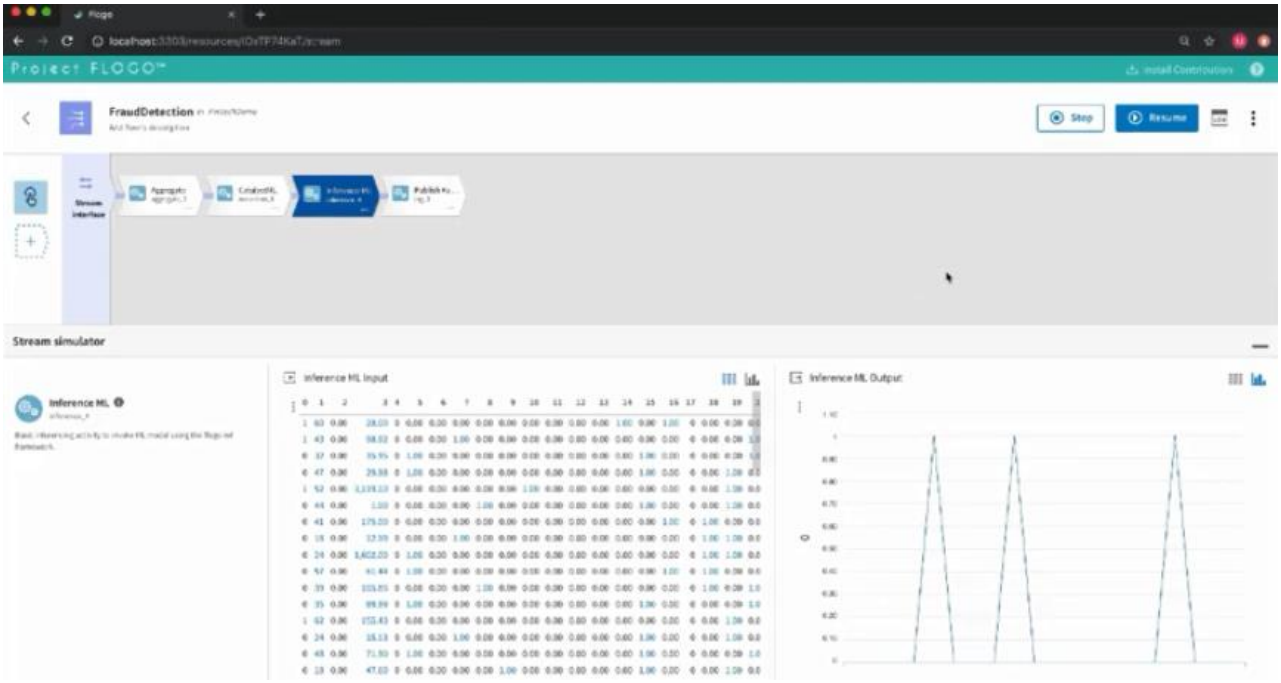

Project FLOGO™
FraudDetection
Run Stream
Import stream inputs from
.CSV
Drag and drop


Project FLOGO™
FraudDetection
Stop
Pause
Stream simulator
Input data is not yet available for display
Output data is not yet available to display


Project FLOGO™
FraudDetection
Stop
Pause
Stream simulator
Stream input
Output data is not yet available to display


Project FLOGO™
FraudDetection
Stop
Pause
Stream simulator
CatalystML
CatalystML Input
CatalystML Output


Project FLOGO™
FraudDetection
Stop
Pause
Stream simulator
Inference ML
Inference ML Input
Inference ML Output


Project FLOGO™
FraudDetection
Stop
Resume
Stream simulator
Inference ML
Inference ML Input
Inference ML Output

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