



Apache Pulsar with MQTT for Edge Computing

Timothy Spann | Developer Advocate



Tim Spann
Developer Advocate

DZone Zone Leader and Big Data
MVB Data DJay

- <https://www.datainmotion.dev/>
- <https://github.com/tspannhw/SpeakerProfile>
- <https://dev.to/tspannhw>
- <https://sessionize.com/tspann/>





FLIP Stack Weekly

This week in Apache Flink, Apache Pulsar, Apache NiFi, Apache Spark and open source friends.

<https://bit.ly/32dAJft>

Why Apache Pulsar?



Unified
Messaging
Platform



Guaranteed
Message
Delivery



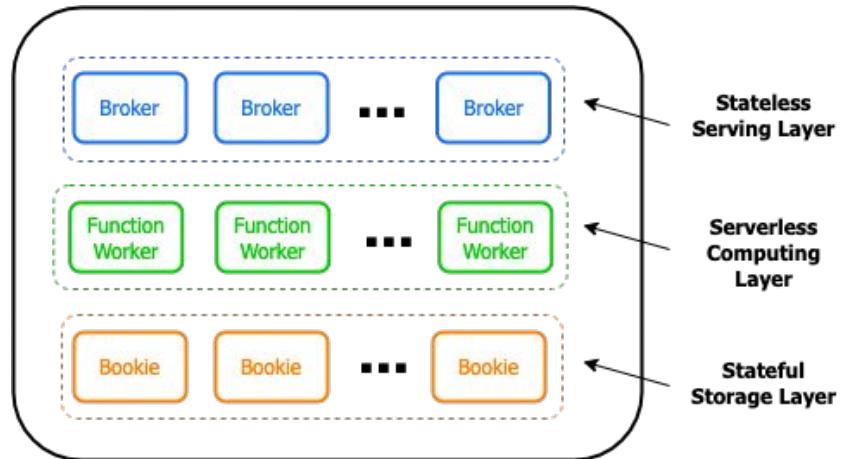
Resiliency



Infinite
Scalability

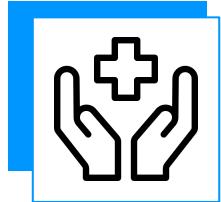
Apache Pulsar

- Serverless computing framework.
- Unbounded storage, multi-tiered architecture, and tiered-storage.
- Streaming & Pub/Sub messaging semantics.
- Multi-protocol support.



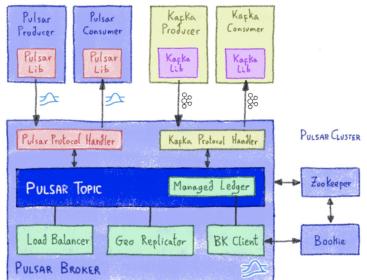
A Unified Messaging Platform





Connectivity

hub.streamnative.io

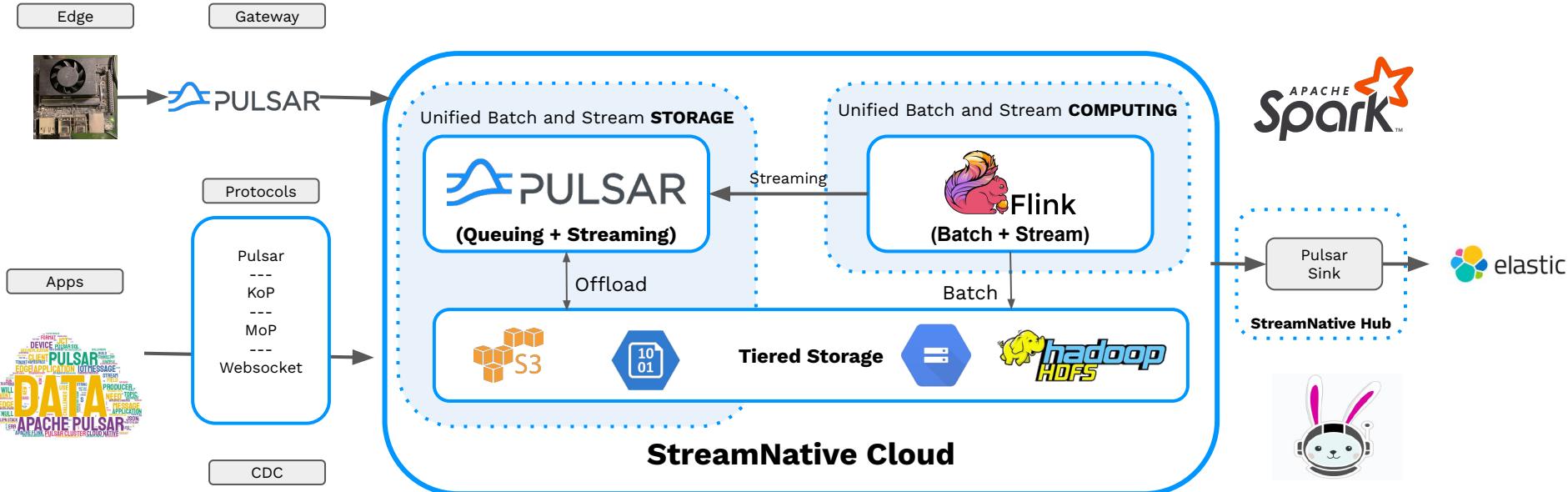


- **Functions** - Lightweight Stream Processing (Java, Python, Go)
- **Connectors** - Sources & Sinks (Cassandra, Kafka, ...)
- **Protocol Handlers** - AoP (AMQP), KoP (Kafka), MoP (MQTT)
- **Processing Engines** - Flink, Spark, Presto/Trino via Pulsar SQL
- **Data Offloaders** - Tiered Storage - (S3)

Streaming FLiPS Apps

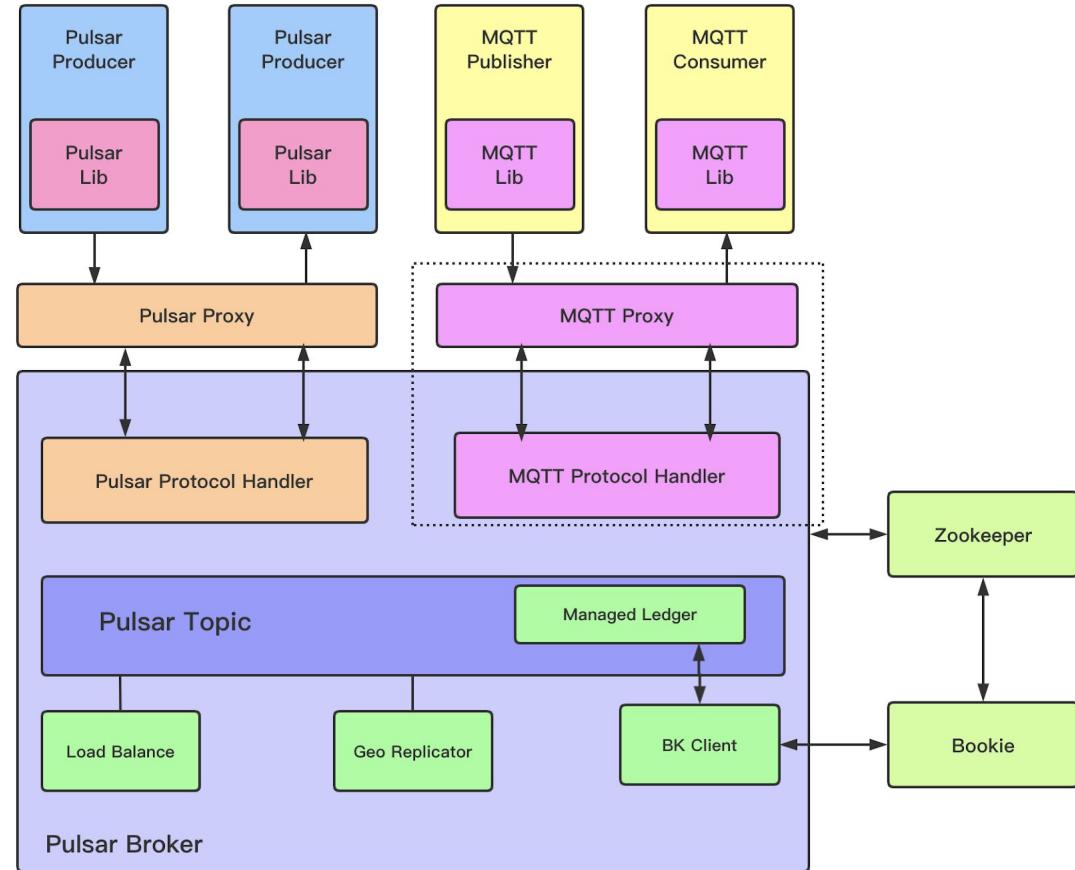
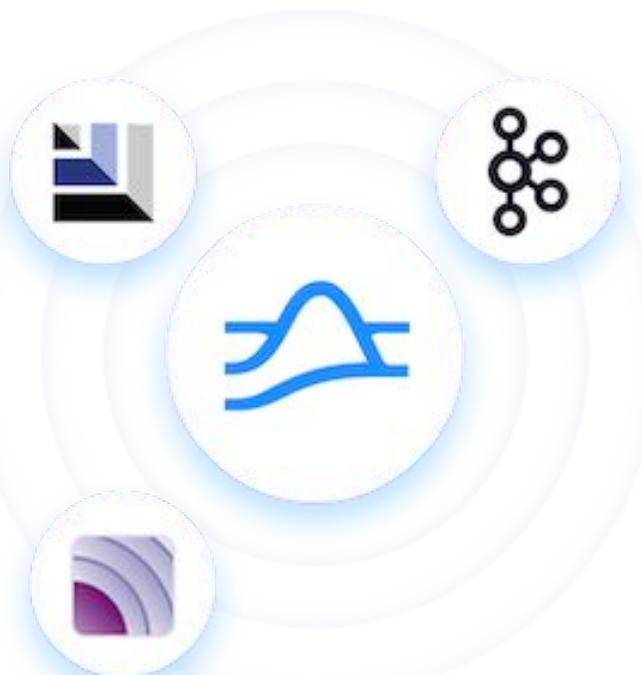
<-> Events <->  **PULSAR** <-> Events

 **Flink**



 **StreamNative**

MQTT on Pulsar (MoP)



Ingesting IoT Data via Java Pulsar

```
UUID uuidKey = UUID.randomUUID();
String pulsarKey = uuidKey.toString();
String OS = System.getProperty("os.name").toLowerCase();
String message = "" + jct.message;
IoTMessage iotMessage = parseMessage("") + jct.message);
String topic = DEFAULT_TOPIC;
if ( jct.topic != null && jct.topic.trim().length()>0) {
    topic = jct.topic.trim();
}
ProducerBuilder<IoTMessage> producerBuilder = client.newProducer(JSONSchema.of(IoTMessage.class))
    .topic(topic)
    .producerName("jetson")
    .sendTimeout(5, TimeUnit.SECONDS);

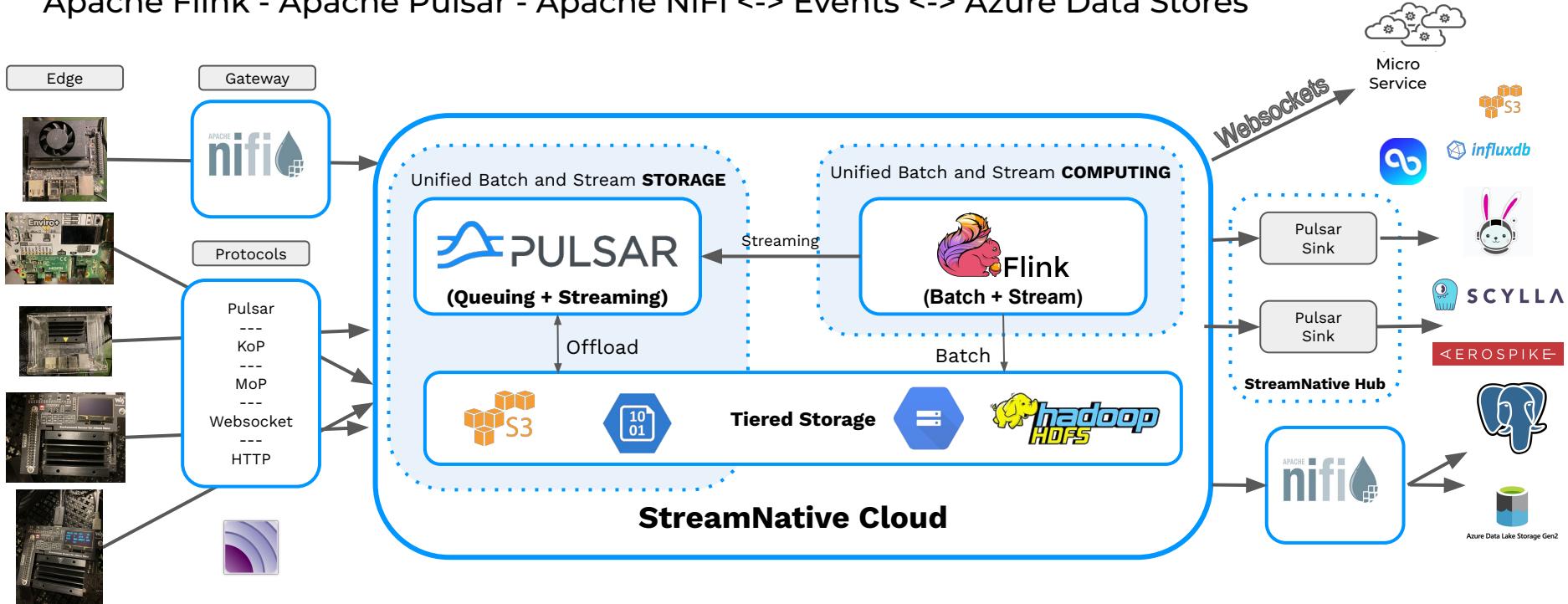
Producer<IoTMessage> producer = producerBuilder.create();

MessageId msgID = producer.newMessage()
    .key(iotMessage.getUuid())
    .value(iotMessage)
    .send();
```

<https://github.com/tspannhw/StreamingAnalyticsUsingFlinkSQL/>

End-to-End Streaming FLiP(N) Apps

Apache Flink - Apache Pulsar - Apache NiFi <-> Events <-> Azure Data Stores



MQTT from Python

```
pip3 install paho-mqtt
```

```
import paho.mqtt.client as mqtt  
client = mqtt.Client("rpi4-iot")
```

```
row = {}  
row['gasKO'] = str(readings)  
json_string = json.dumps(row)  
json_string = json_string.strip()  
client.connect("pulsar-server.com", 1883, 180)  
client.publish("persistent://public/default/mqtt-2", payload=json_string,  
              qos=0, retain=True)
```



Using NVIDIA Jetson Devices With Pulsar

<https://dev.to/tspannhw/unboxing-the-most-amazing-edge-ai-device-part-1-of-3-nvidia-jetson-xavier-nx-595k>

<https://github.com/tspannhw/minifi-xaviernx/>

<https://github.com/tspannhw/minifi-jetson-nano>

<https://github.com/tspannhw/Flip-iot>

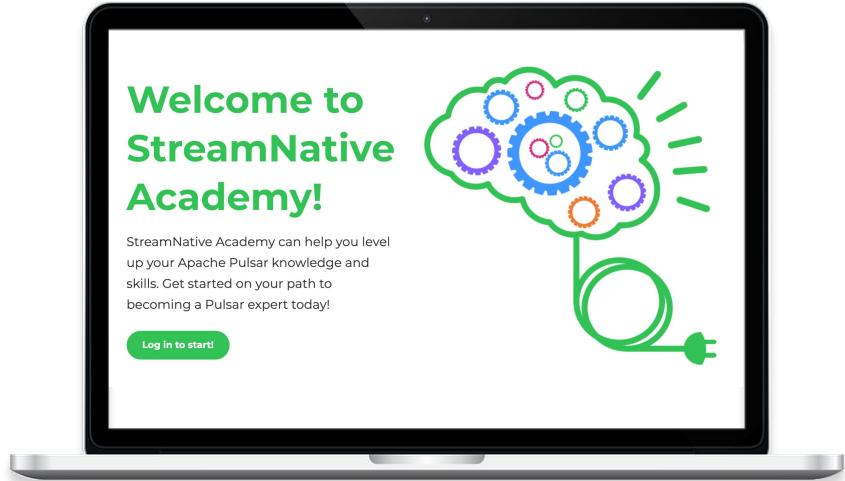
<https://www.datainmotion.dev/2020/10/flank-streaming-edgeai-on-new-nvidia.html>

<https://github.com/tspannhw/FLiP-Mobile/blob/30bcc1ec98fc31e039b51a06180d98545c1e0542/python3/enviro.py>



Now Available On-Demand Pulsar Training

Academy.StreamNative.io



Platform Engineer [Remote]

San Francisco

Platform Engineer (Flink/Spark) [Remote]

San Francisco

Product Engineer - Cloud [Remote]

San Francisco

Platform Engineer (Flink/Spark) [Remote]

San Francisco

Product Engineer - Cloud [Remote]

San Francisco

Sr. Product Manager [Remote]

San Francisco

We're Hiring

streamnative.io/careers/



StreamNative

Connect with the Community & Stay Up-To-Date

- Join the Pulsar Slack channel - Apache-Pulsar.slack.com
- Follow [@streamnativeio](https://twitter.com/streamnativeio) and [@apache_pulsar](https://twitter.com/apache_pulsar) on Twitter
- [Subscribe](#) to Monthly Pulsar Newsletter for major news, events, project updates, and resources in the Pulsar community

Let's Keep in Touch!



Timothy Spann
Developer Advocate



@PaaSDev



<https://www.linkedin.com/in/timothyspann>



<https://github.com/tspannhw>