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API Management for sustainable EDA

DEEP WITHIN THE EVENT-NATIVE GRAVITEE.IO API MANAGEMENT PLATFORM

15/12/2022

Dorian BLANC

Senior Solution Engineer
+33 7 85 68 06 76
dorian.blanc@graviteesource.com

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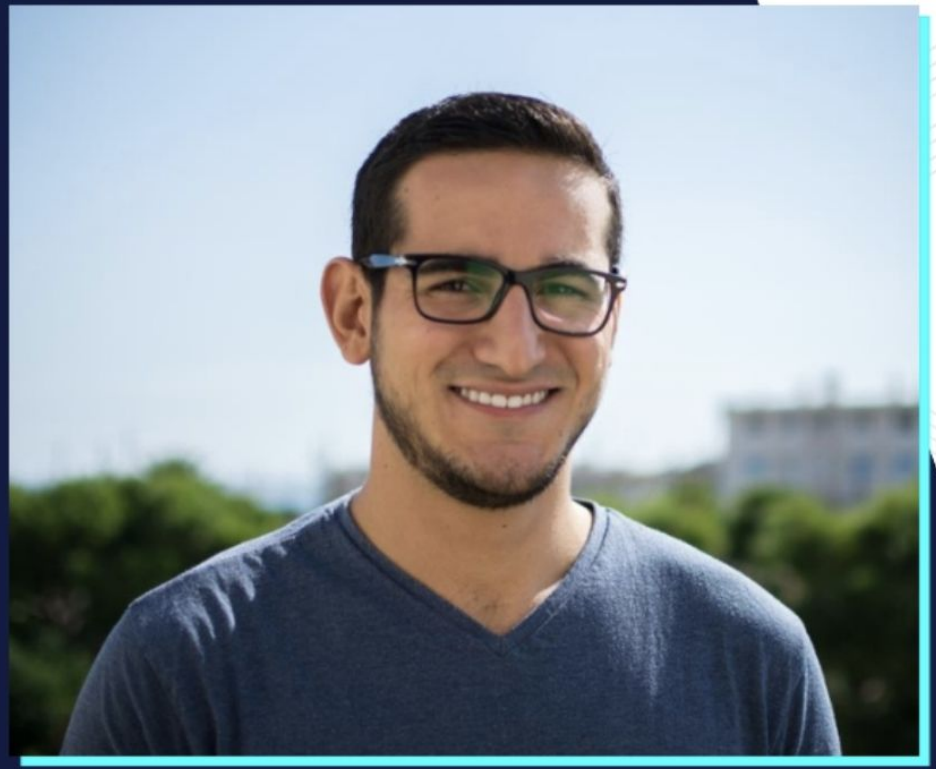


apidays PARIS

Dorian Blanc

Solution Engineer & Technical APIm Consultant, Gravitee.io

API Management for Sustainable EDA with Gravitee

STAGE 9
DECEMBER 15 - 11:40AM CEST

Effortlessly control the API ecosystem

with

gravitee.io

The most **complete** and **downloaded** Open Source API management platform on the market.

Key Metrics

Created 7 years ago.
Used by **major brands** in Fortune 500, Nasdaq and French, UK and Danish governments.

350,000+
global downloads per month

163%
YoY growth

Customers in **23 countries**

100+ staff globally spread

$11m + $30m
Series A & B

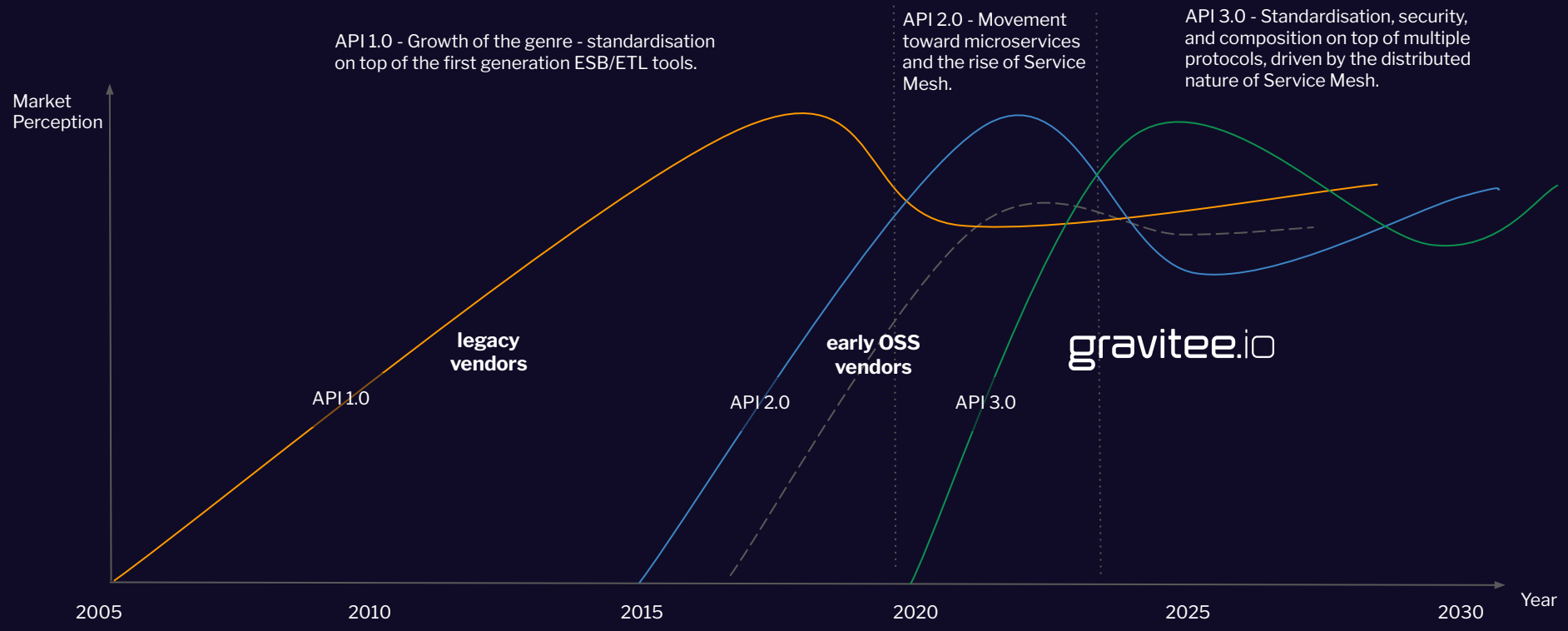
Agenda

- Evolution of APIs and API management platforms
- Why asynchronous and real-time APIs ?
  → Heterogeneous & distributed ecosystems
- Gravitee.io Event Native API Management
- Lab 👩‍🎤👨‍🎤 : Pixel War (aka r/Place)

1.

Evolution of APIs & API management platforms

API 3.0 - Next Generation API Platform



Evolution of APIs

API 1.0

Standard / Legacy APIs

Emergence of the API-First development, focus on the consumer, guarantee of a good API design.

- Expose APIs for
  - Internal purpose
  - Partners
  - Publicly
- Leverage the power of HTTP
  - Previously used as a channel to communicate
  - Now at the heart of APIs
- Rest APIs
- API Management / API Gateways are coming!

Evolution of APIs

Micro-service architecture

Adoption of micro-services to gain in agility and increase pace of innovation, **creates new challenges** (explosion of #APIs, adoption of new protocol such as gRPC, service-mesh, ...).

- New architectural / design pattern (~2011)
- Avoid monolith / SOA approach
- Loose coupling between services
- Each service has its own lifecycle
- Manage east-west traffic
- Introduction of Service Mesh
  - Some overlaps with API Gateway

Evolution of APIs

Event Driven Architecture

Explosion of data requires **adoption of real time streaming capabilities** to keep up with the need for fast decision making and real time user experience (Confluent Kafka)

IoT

Proliferation of devices and emergence of a new generation of mobile network (5g) **creates opportunities for disruptive business models** (requires specific IoT protocol such as MQTT).

- New technologies
- Scalability
- High throughput
- Real-time streaming

2.

Why asynchronous and real-time APIs ?
→ Heterogeneous & distributed ecosystems

Modern (cloud) applications

Distributed, heterogeneous and interactive

A common mistake is to think of applications just in terms of the backend infrastructure. Today's applications are distributed both geographically and in terms of where compute is run. The distinction between client and server is increasingly disappearing.

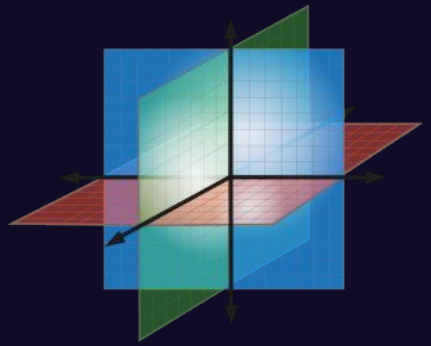
Modern (cloud) applications

Increasing number of clients types, platforms, languages ,...

Mobiles phones, Browsers, Servers,
Smart Homes, Building, Factories, Cities (IoT),
Gaming consoles, ...

Modern (cloud) applications

A 3 axis challenge

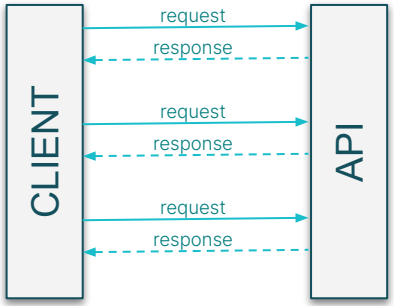


- **Deployment topologies**
- **Platforms / Frameworks**
- **Protocols / Interaction models**

Change in communication paradigm

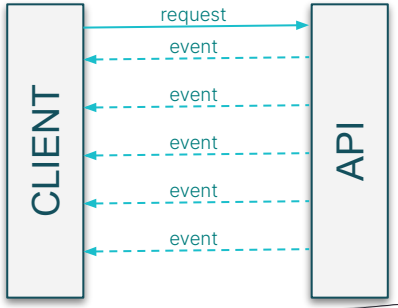
Traditional APIs (request/response)

- Synchronous
- Stateless
- Point-to-point communication
- Conversational
- OpenAPI spec
- JSON / XML data format
- e.g. HTTP, SOAP, GraphQL

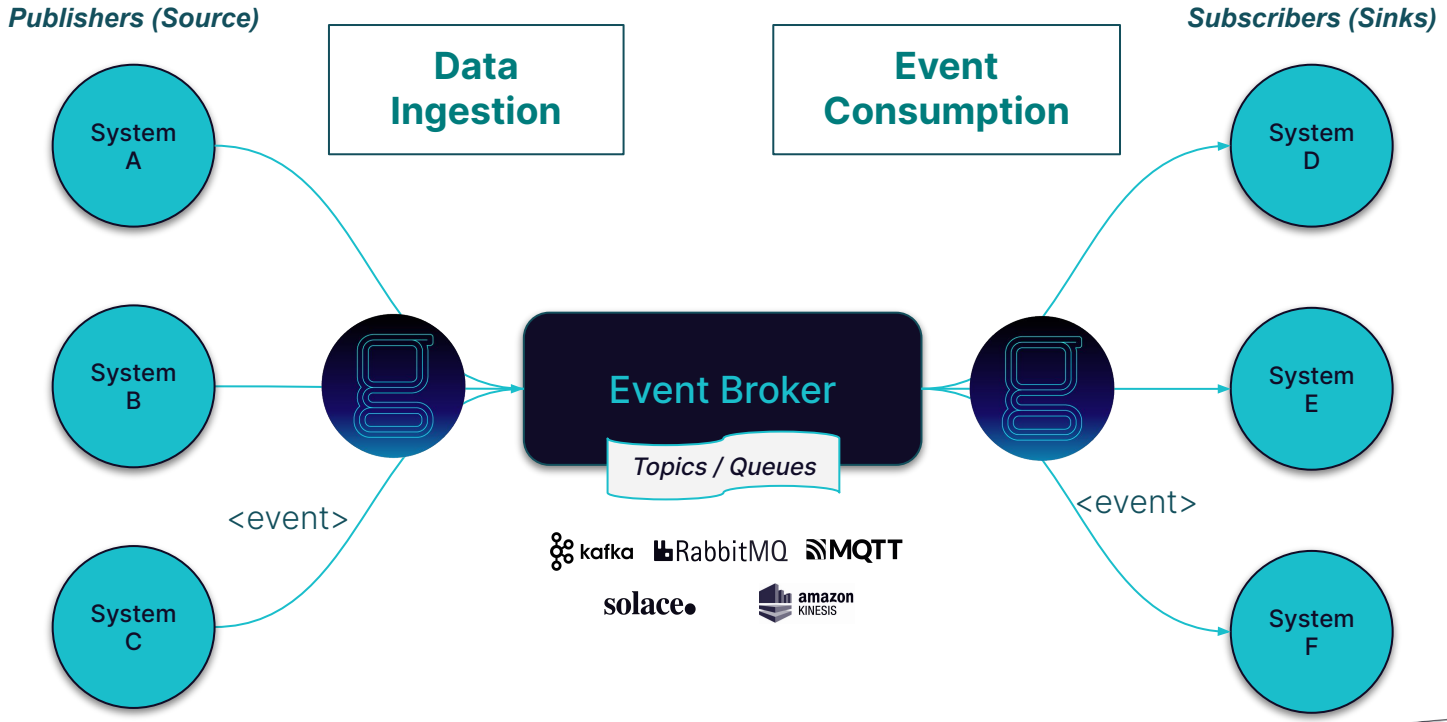


Event-Driven APIs

- Asynchronous
- Stateful
- Direct, fan-out communication (event broker)
- Pub/Sub model
- AsyncAPI spec
- Plain & Binary data format
- e.g. Websocket, SSE, Webhook, Kafka, AMQP, MQTT



APIm & EDA


Publishers (Source)
Data Ingestion
Event Consumption
Subscribers (Sinks)
System A
System B
System C
<event>
Event Broker
Topics / Queues
kafka
RabbitMQ
MQTT
solace
amazon KINESIS
<event>
System D
System E
System F

Current state of “async” APIs

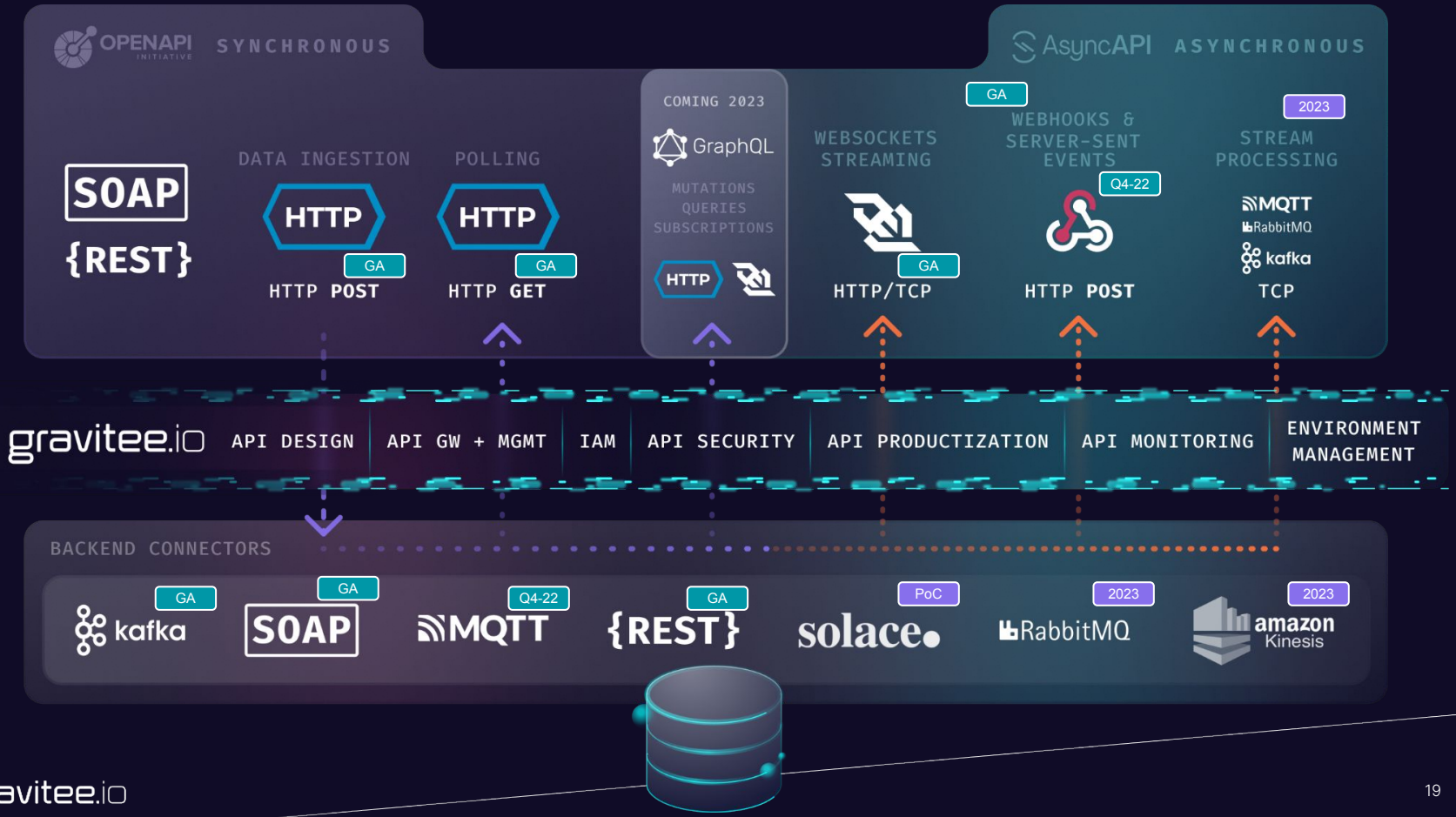
- AsyncAPI spec inspired by the well-known OpenAPI spec.
- Support “Asynchronous API” definition
- Large variety of bindings (Kafka, AMQP, MQTT, SNS, ...)

- Consumer must speak the same “language” as the binding
- What level of security (authentication / authorization) ?
- What about traffic monitoring ?

3.

Event Native API Management

Event-native API Management

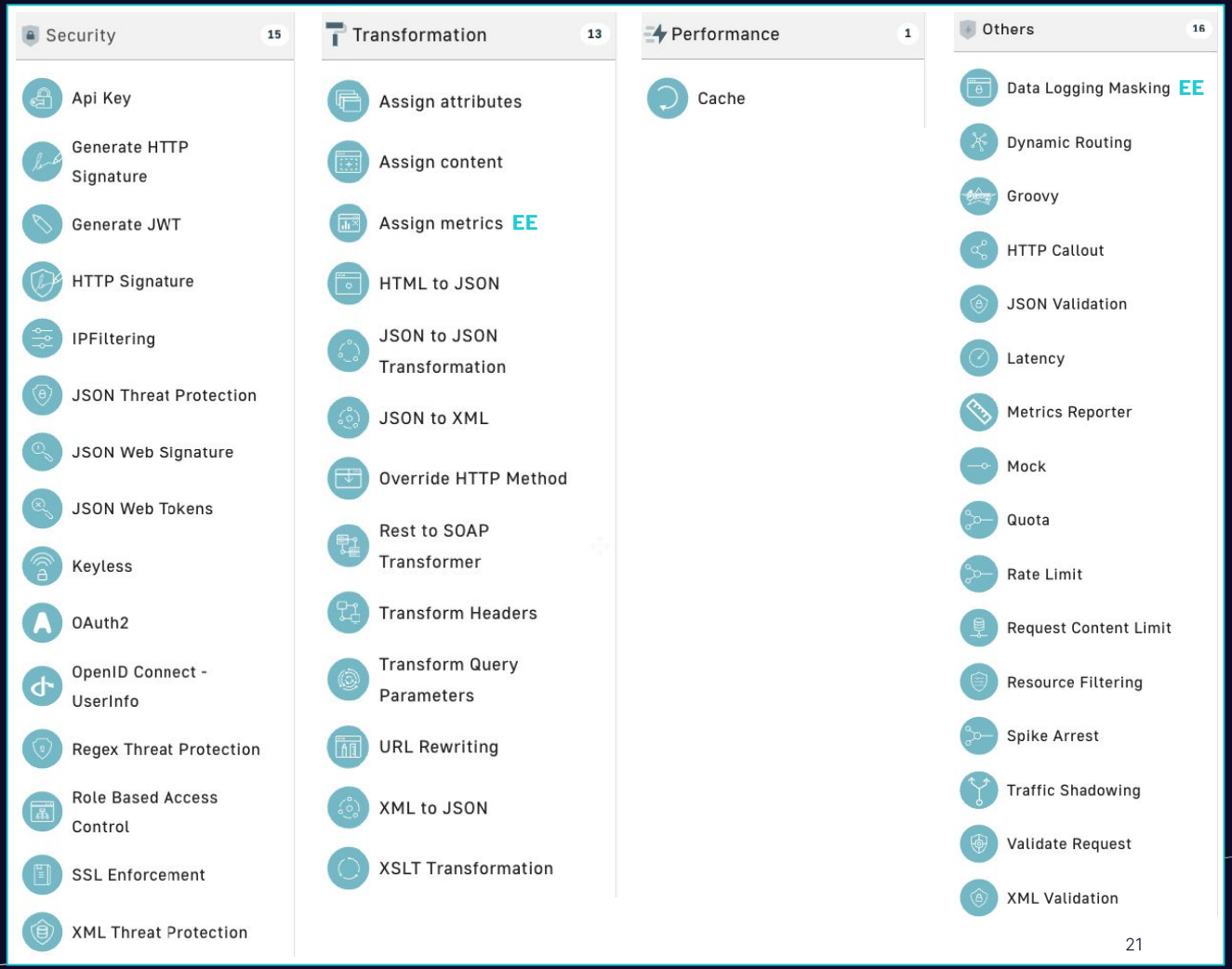


API Management Lifecycle

Complete lifecycle management is a key success factor for digital business enablement

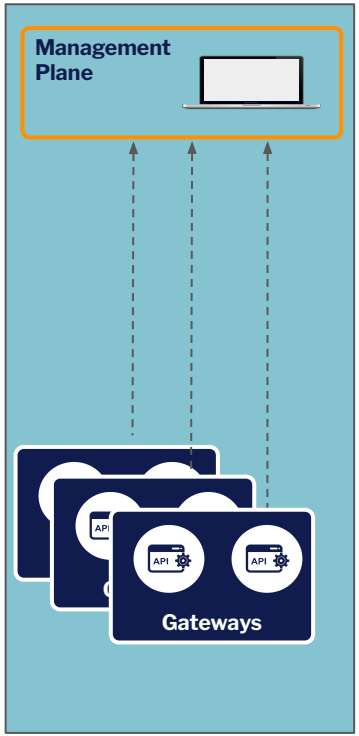
Gravitee.io platform provides all the necessary solutions for a complete API management lifecycle support.

Gravitee.io APIm Policies (45+)

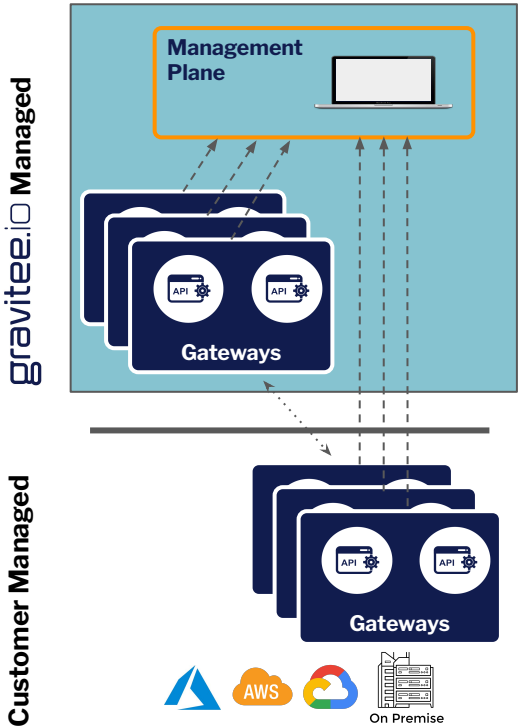


Flexible Deployment Models

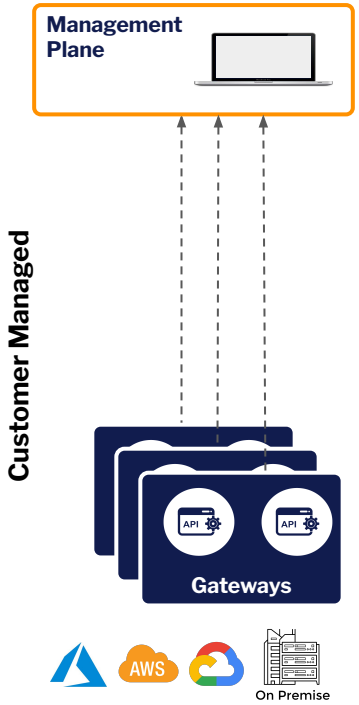
SaaS



Hybrid



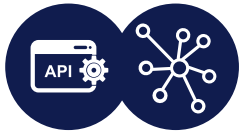
On-Prem / Private Cloud



https://www.gravitee.io/downloads

Deployment Technologies

A wide range for all contexts



API Management

Access Management

Amazon AWS

Docker

Kubernetes

Zip

RedHat

Alert Engine

Docker

Kubernetes

Zip

Cockpit

API Designer

SaaS Only

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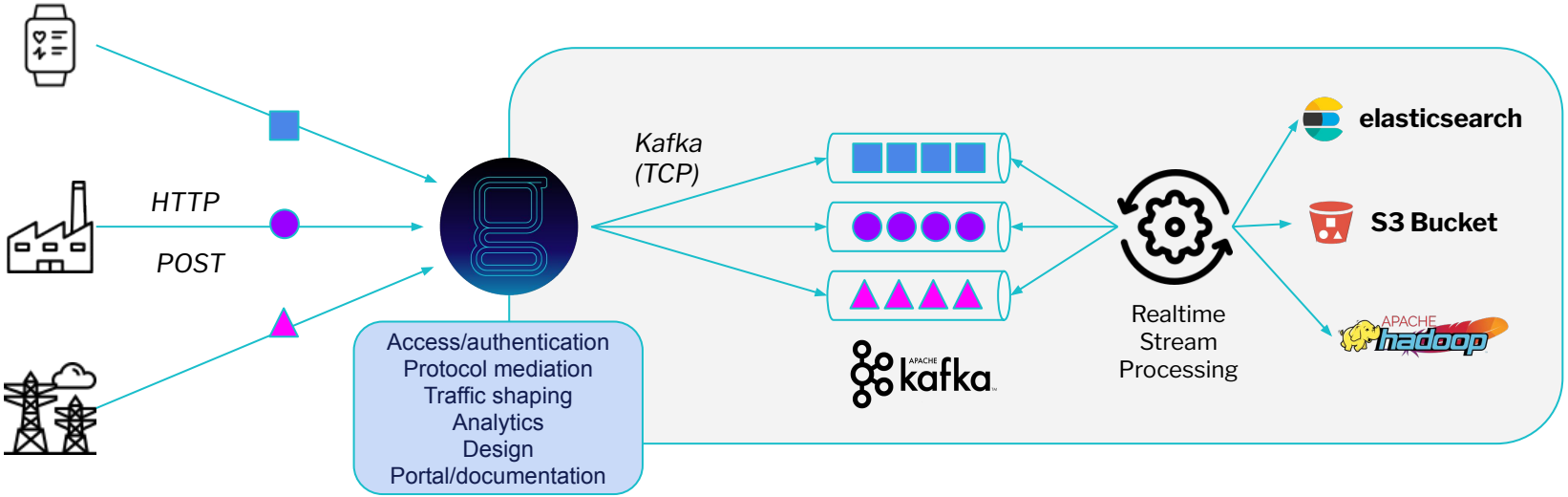
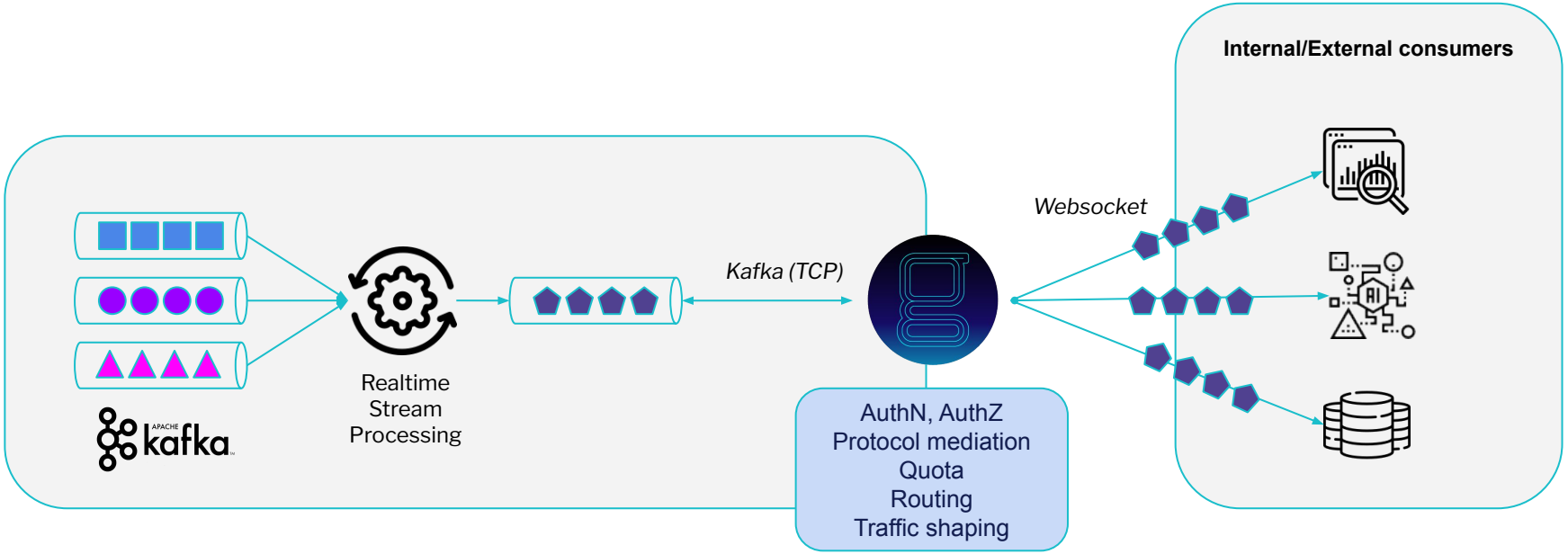
Stay in control of your *sync* and *async* APIs

- Centralized access to heterogeneous sources of data
- Manage the consumers (with subscriptions, authentication, rate-limit, filtering, ...)
- Secure access to APIs by relying on standards (OAuth2, JWT, MTLS, ...)
- Benefit from OpenAPI & AsyncAPI to describe your APIs
- Consumers know how-to do standard API calls (ie. over HTTP)
- Monitor the access to the data (metrics, analytics, ...)

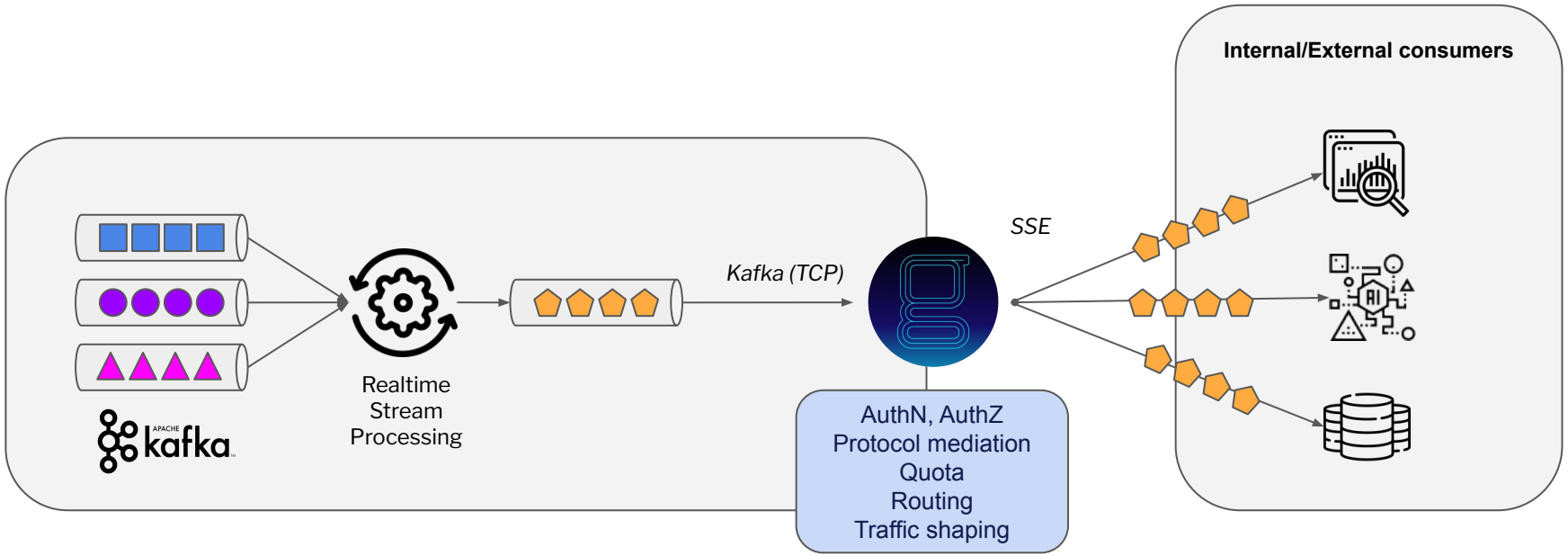
Use case - Data ingestion



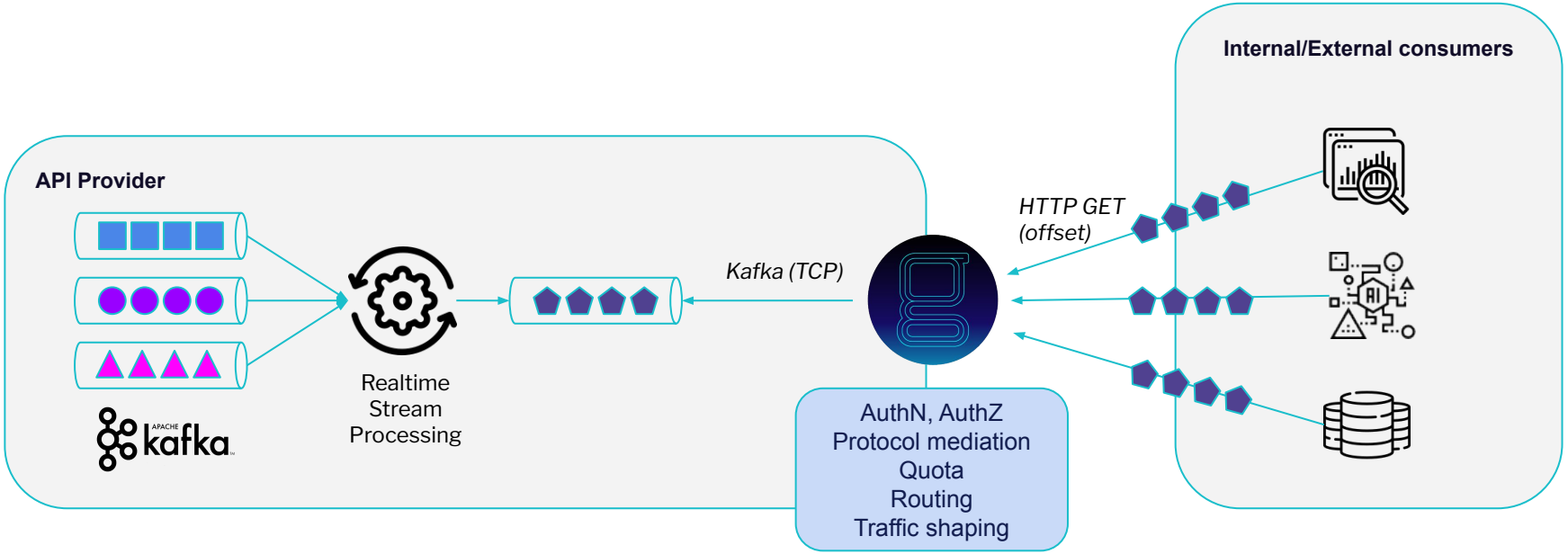
Use Case - Event Consumption (Streaming)



Event consumption - Streaming



Use Case - Event Consumption (HTTP Polling)



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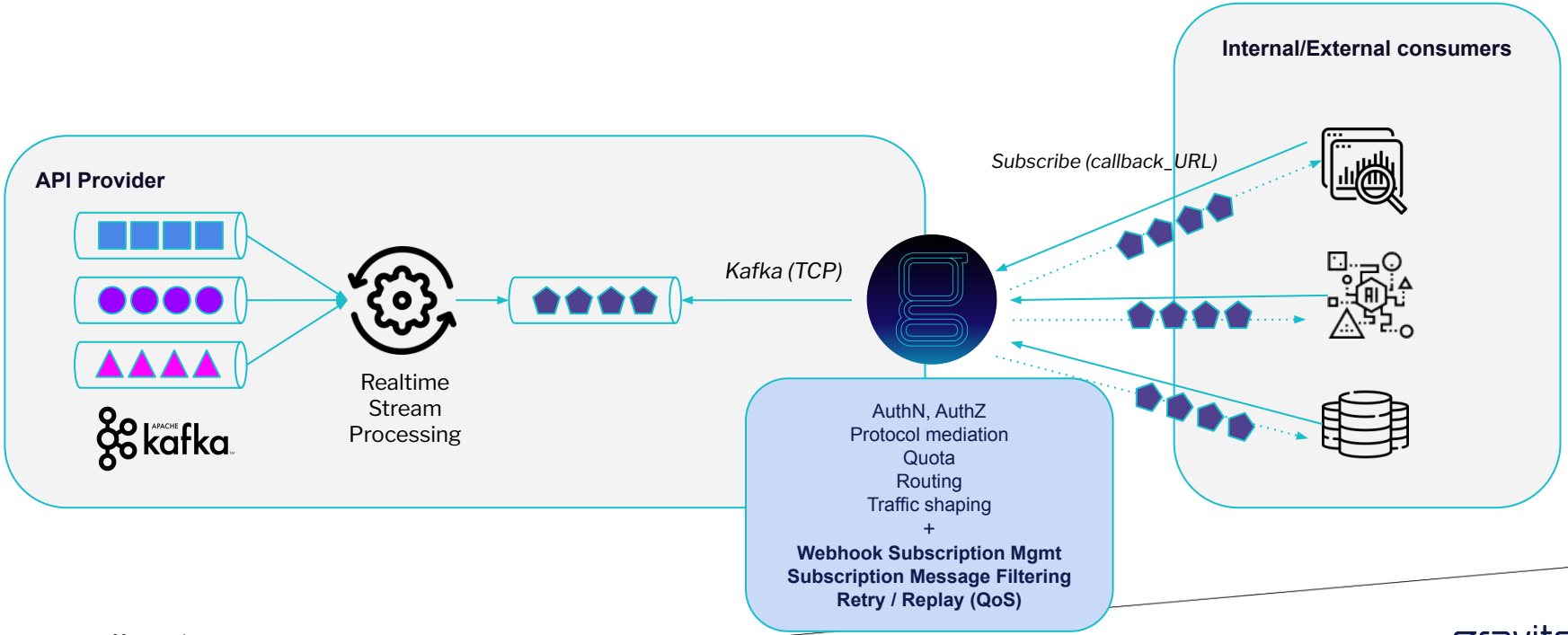
Use Case - Event Consumption (Webhook)



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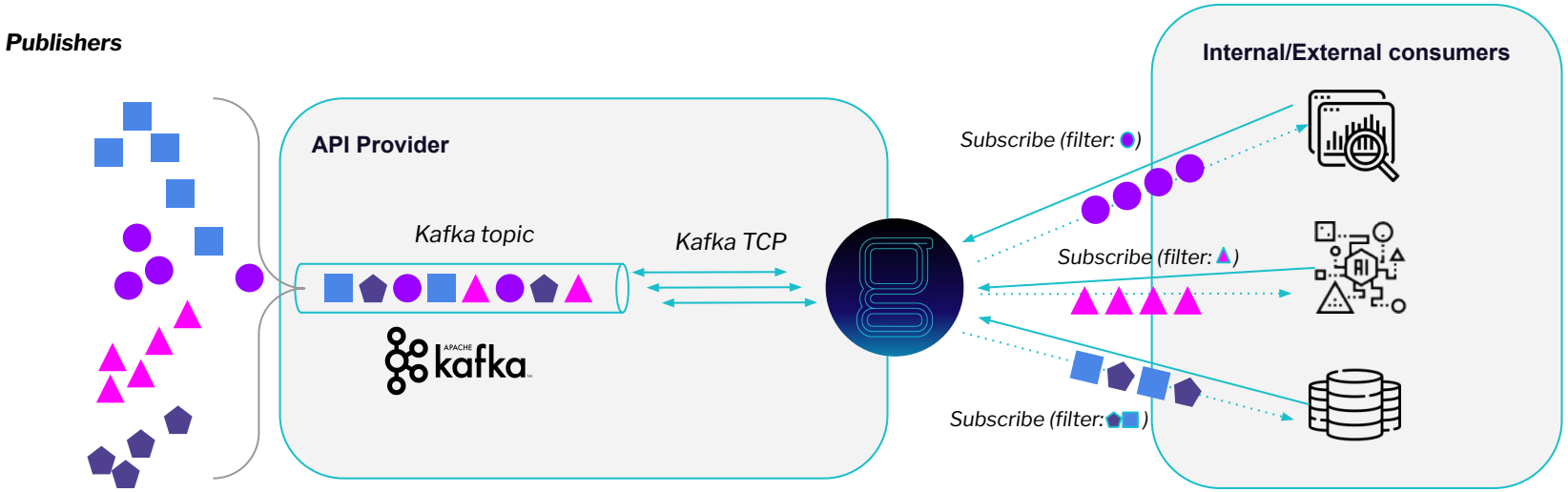
Use Case - Subscription Message Filtering



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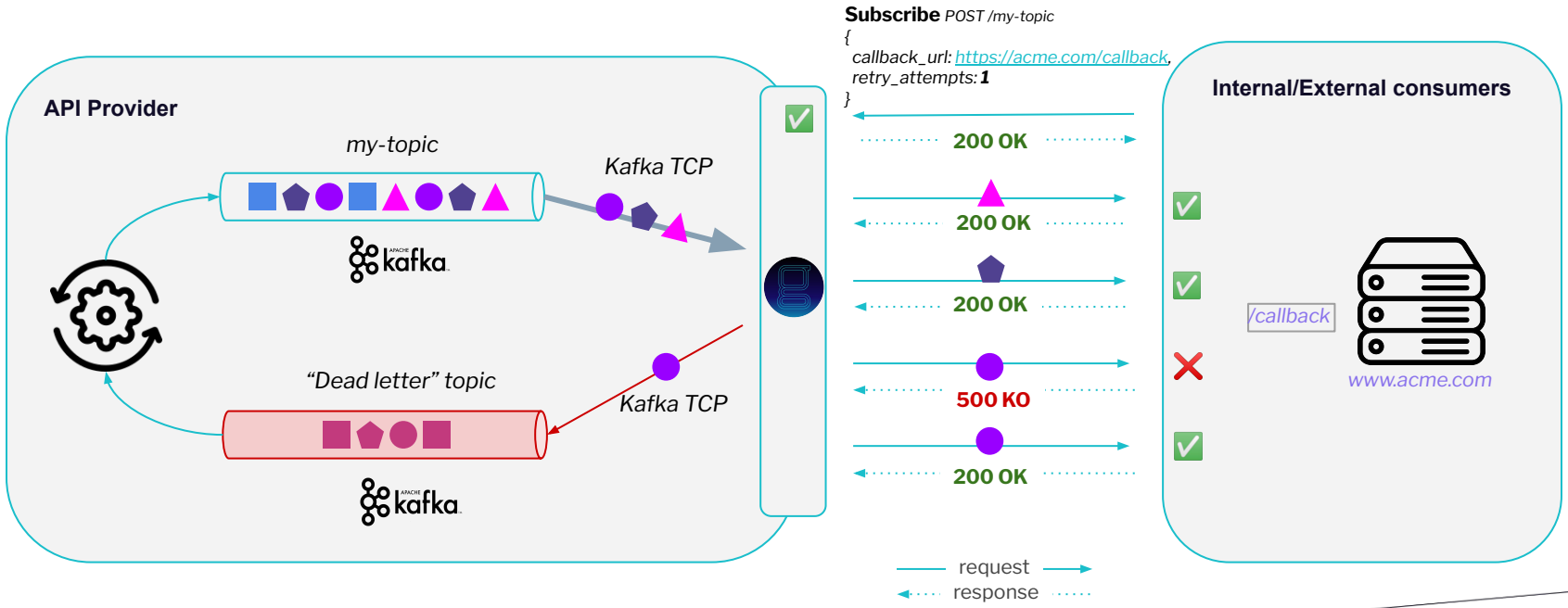
Use Case - Retry / Dead letter / Replay



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4.

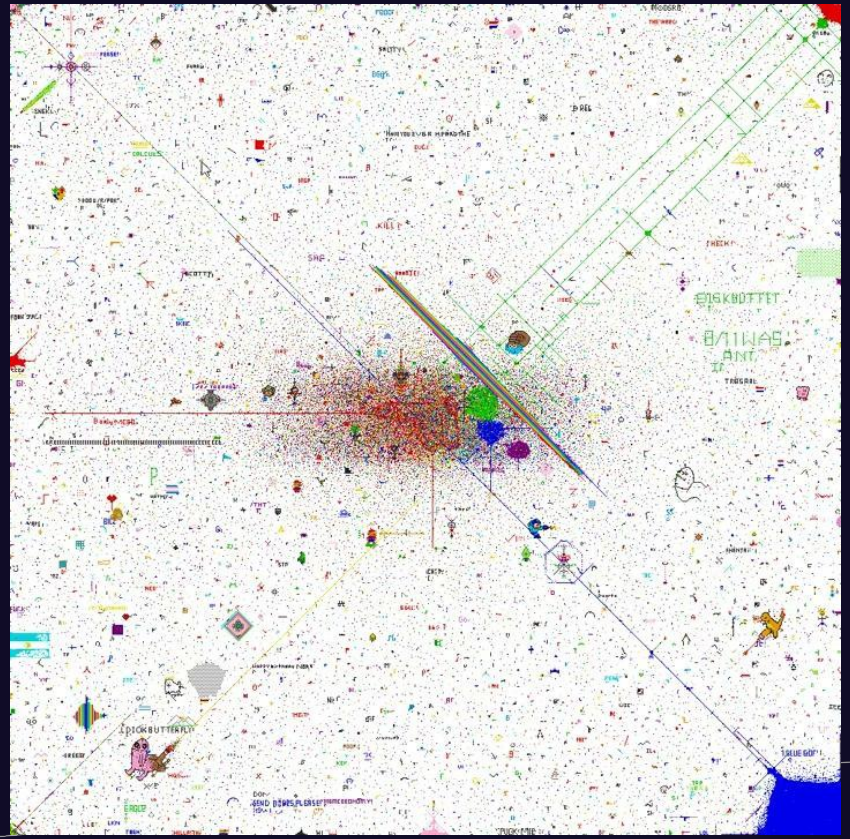
g/Place Lab 

g/Place (aka r/Place or Pixel War)

r/place was a **collaborative project and social experiment** hosted on the social networking site Reddit on April Fools' Day 2017 and repeated again on April Fools' Day 2022.

2022 edition insights :

- 1000×2000 and 2000×2000 pixels canvas
- 72 million pixels were placed
- Over 6 million users in 3 days
- A pace of +2.5 million pixels / hour (+2000 avg TPS)



g/Place (aka r/Place or Pixel War)

github.com/gravitee-io-labs/gravitee-gplace-apidays-2022

- You need :
  - A browser and Internet
  - Docker
  - Postman

3 simple steps :

1. Start the stack

   docker-compose -p gravitee-3-20-0-alpha-demo up -d

2. Import the postman collection and environment

3. Open g/Place (localhost:8123).

Thank **You**

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Dorian BLANC
Solution Engineer
+33 7 85 68 06 76
dorian.blanc@graviteesource.com