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Fundamentals for Apache Kafka®

Integrating Apache Kafka Into Your Environment



Session Schedule

- Session 1: Benefits of Stream Processing and Apache Kafka Use Cases
- Session 2: Apache Kafka Architecture & Fundamentals Explained
- Session 3: How Apache Kafka Works
- **Session 4: Integrating Apache Kafka into your Environment**

Learning Objectives



After this module you will be able to:



- Explain how the **Confluent REST Proxy** works
- Justify why **Confluent Schema Registry** is an essential piece of a streaming platform powered by Kafka
- Sketch where and how **Kafka Connect** is used in streaming ETL
- Name main features of **Kafka Streams**
- Elaborate on goals of **Confluent KSQL**

Development and Connectivity



How do I get streams of
data into and out of
Kafka?



Kafka Connect

Import and Export Data In & Out of Kafka



Fault Tolerant



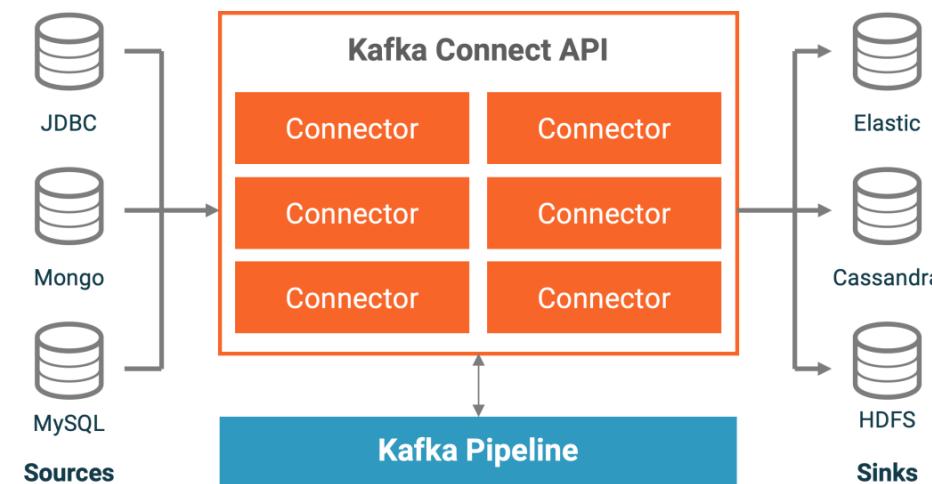
Manage hundreds of data sources and sinks



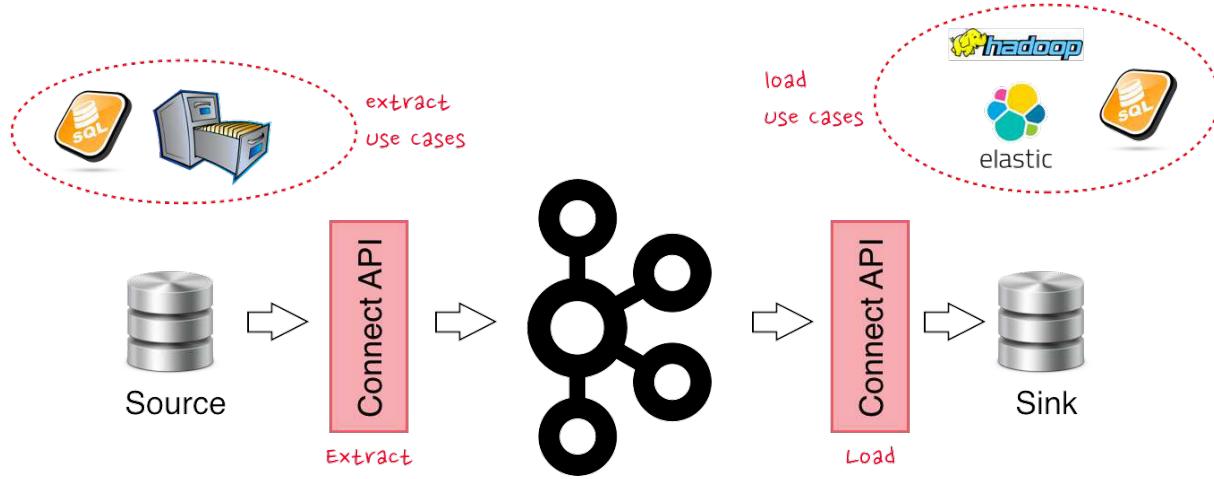
Preserves data schema



Integrated within Confluent Control Center



Kafka Connect



- Framework for Streaming Data between Kafka and other Systems
- Open Source
- Simple, Scalable, and Reliable

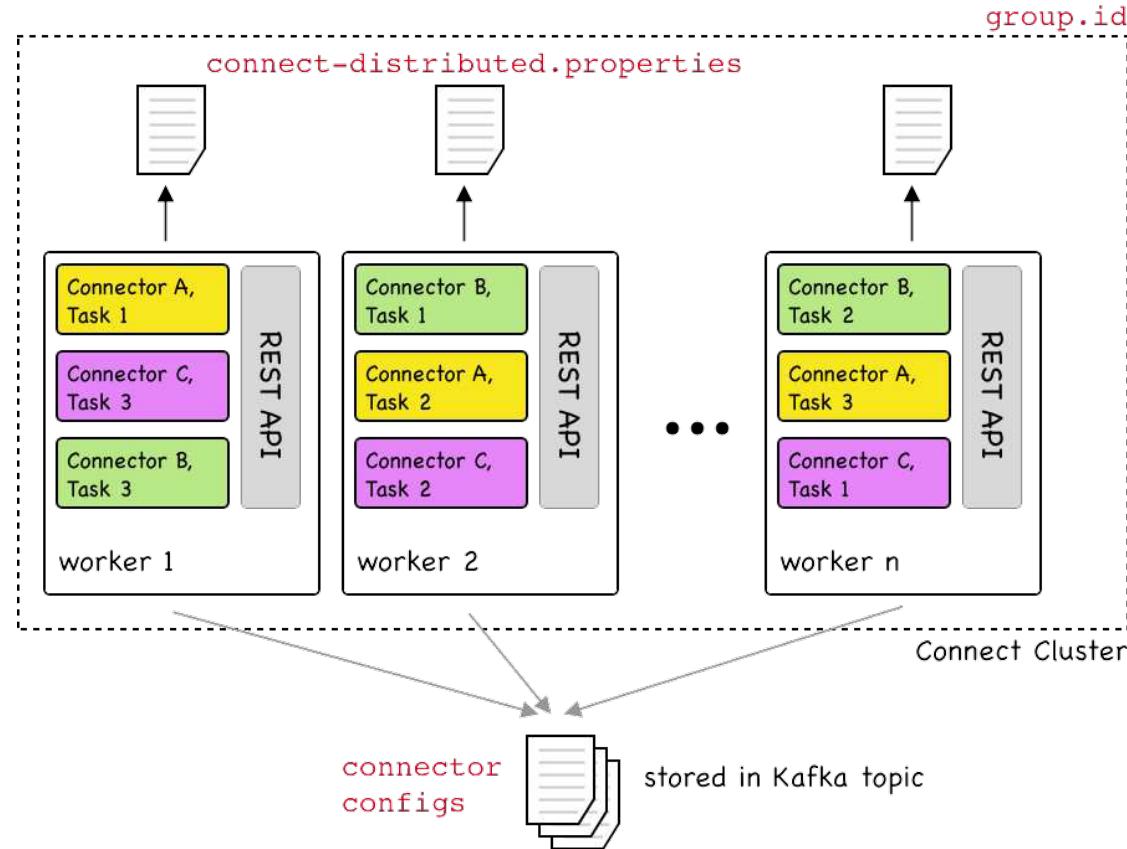
Kafka Connect



Connectors: Connect Kafka Easily with Data Sources and Sinks



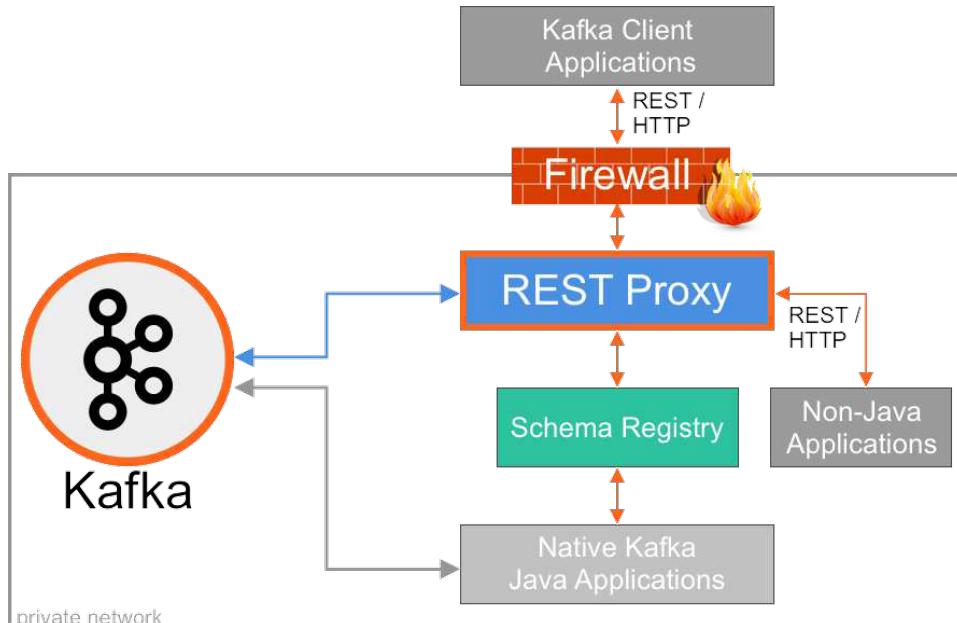
Kafka Connect





Confluent REST Proxy

Talk to non-native Kafka Apps and outside the Firewall



Provides a **RESTful interface** to a Kafka cluster



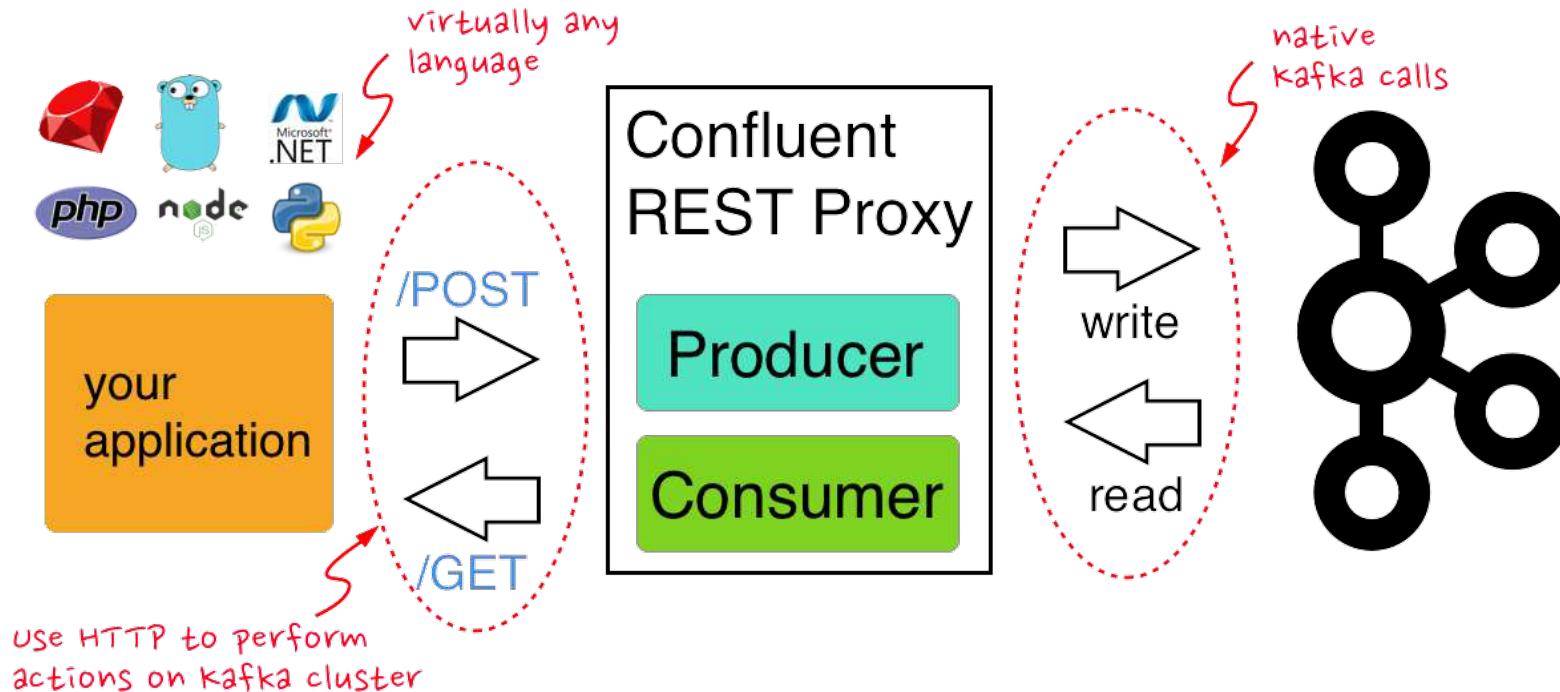
Simplifies message creation and consumption



Simplifies administrative actions



Confluent REST Proxy





Data Compatibility



How do I maintain my
data formats and
ensure compatibility?

The Challenge of Data Compatibility at Scale



■ Incompatibly formatted message



Many sources without a policy
causes mayhem in a
centralized data pipeline



Ensuring downstream systems
can **use the data is key** to an
operational stream pipeline

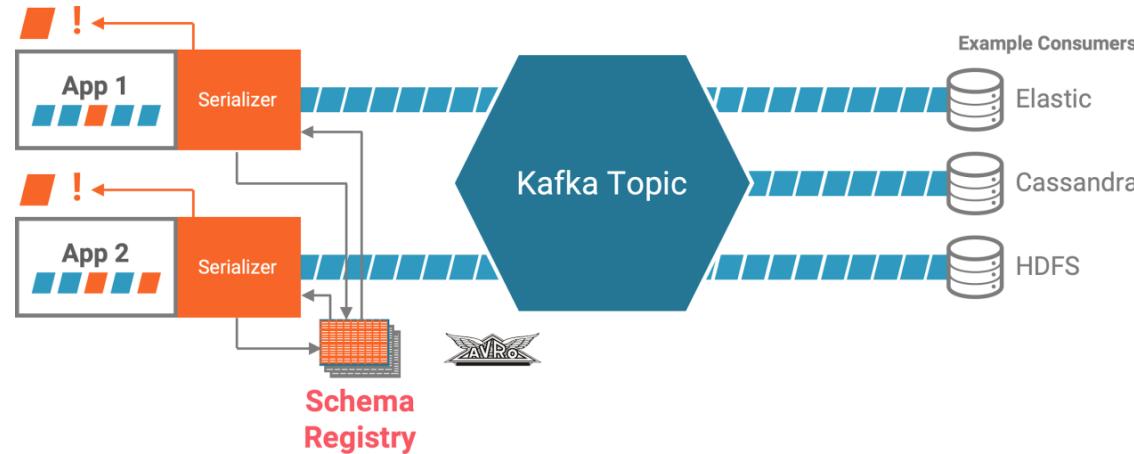


Even within a single
application, **different formats**
can be presented



Confluent Schema Registry

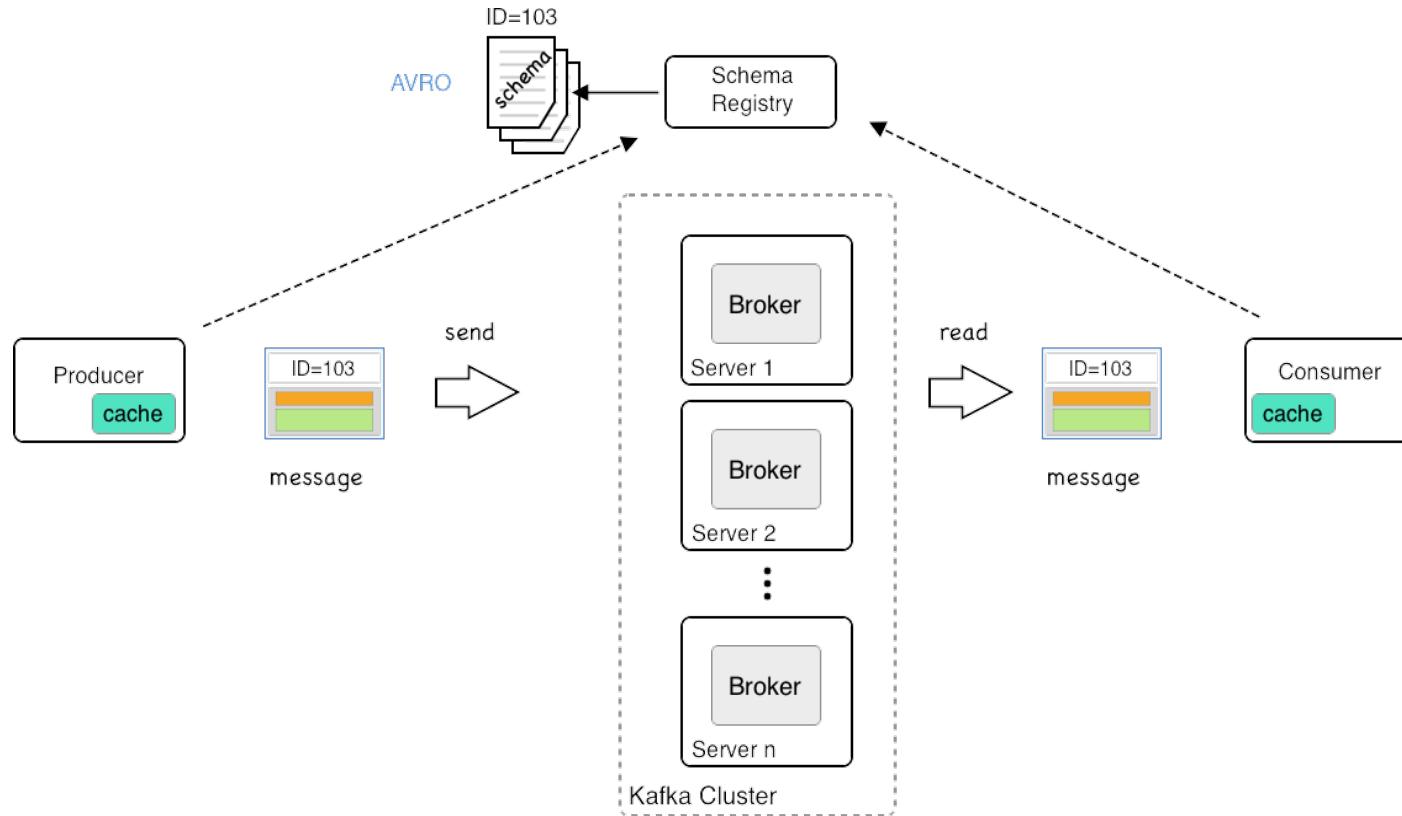
Make Data Backwards Compatible and Future-Proof



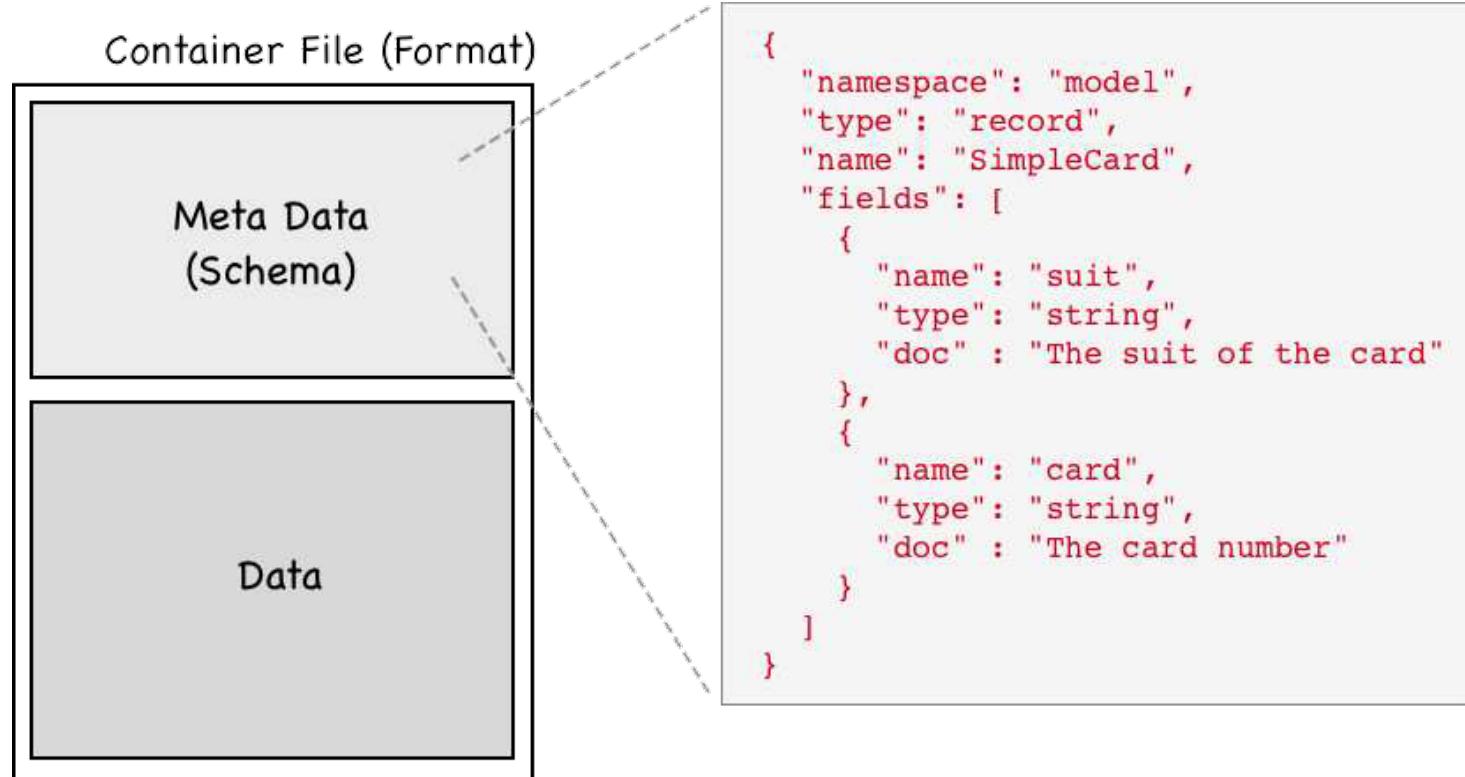
- **Define** the expected fields for each Kafka topic
- Automatically **handle** schema changes (e.g., new fields)
- **Prevent** backwards incompatible changes
- **Support** multi-data center environments



Confluent Schema Registry



AVRO

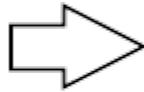


Schema Evolution



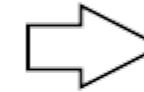
```
person: {  
    lastName: string,  
    firstName: string,  
    age: int,  
    gender: [male, female]  
}
```

V1



```
person: {  
    lastName: string,  
    firstName: string,  
    ssn: string,  
    age: int,  
    gender: [male, female]  
}
```

V2



```
person: {  
    lastName: string,  
    firstName: string,  
    ssn: string,  
    age: int,  
    gender: [male, female,  
           other]  
}
```

V3



Stream Processing



How do I build real-time applications?



Kafka Streams

Transform Data with Real-Time Applications



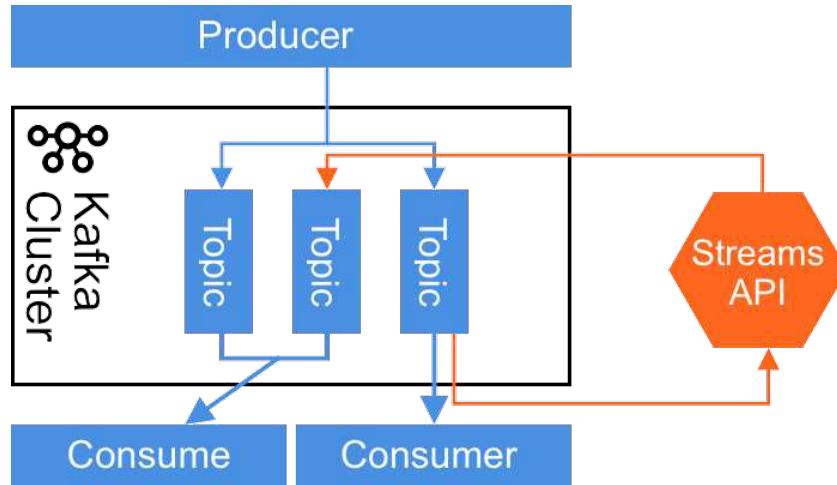
Overview

- Write standard Java applications
- No separate processing cluster required
- Exactly-once processing semantics
- Elastic, highly scalable, fault-tolerant
- Fully integrated with Kafka security



Example Use Cases

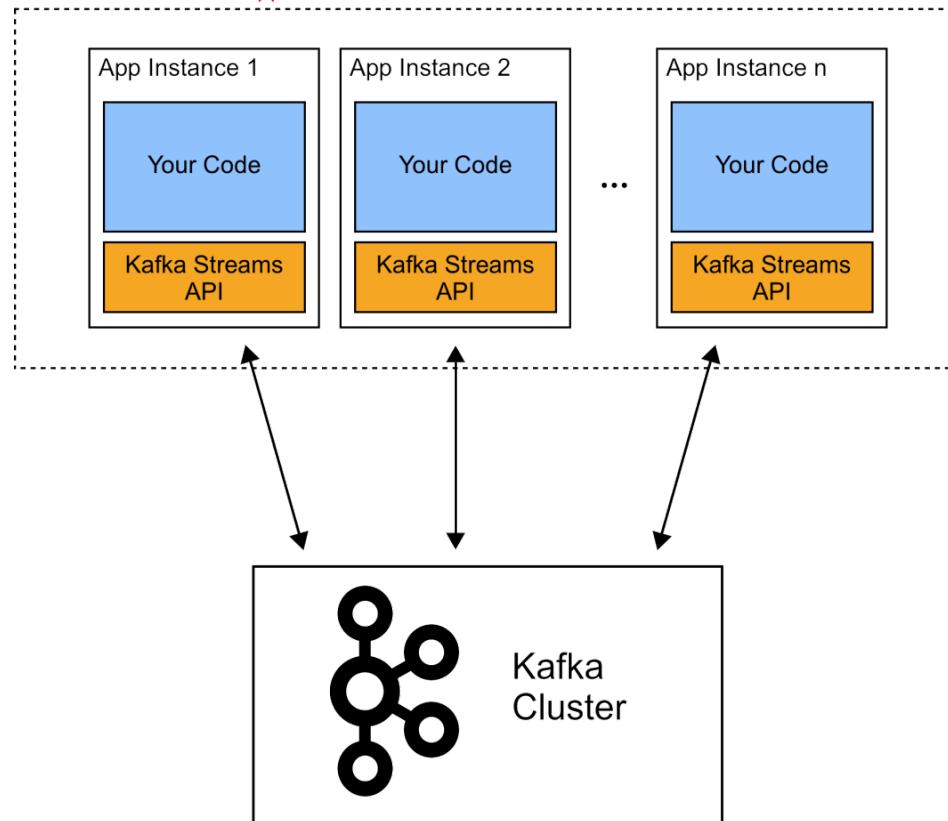
- Microservices
- Continuous queries
- Continuous transformations



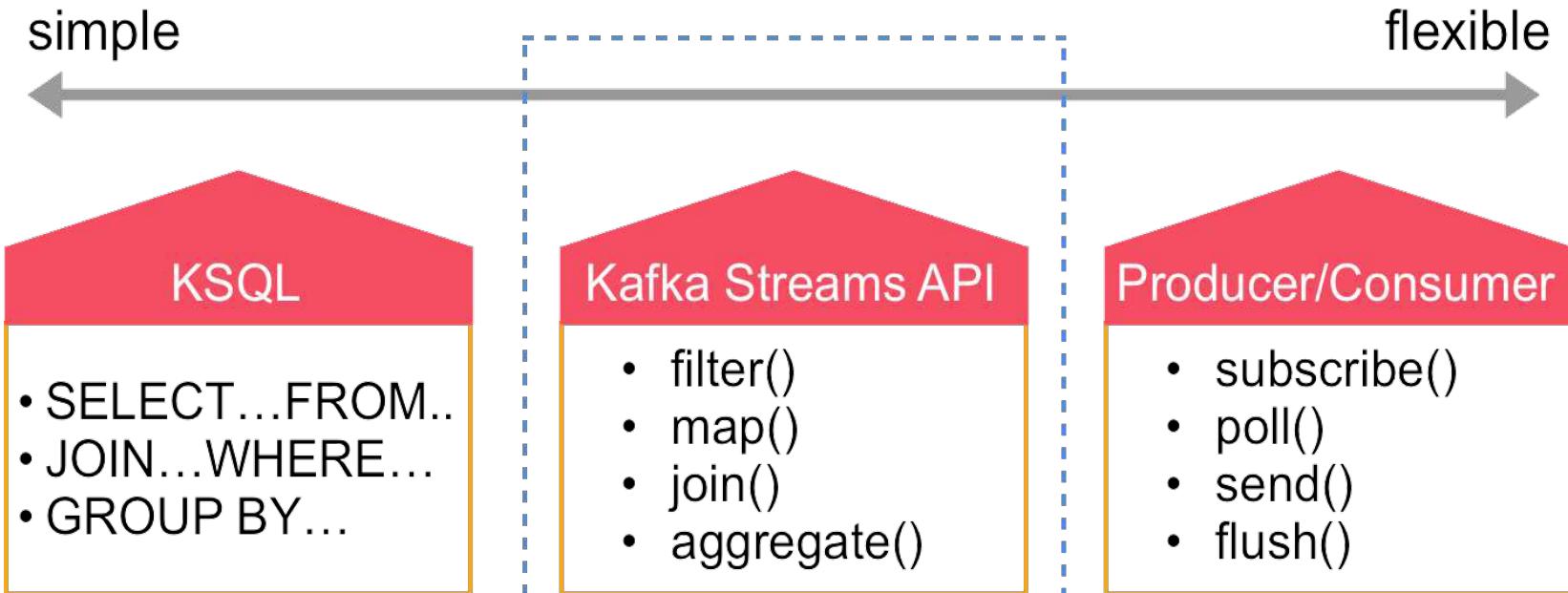


Your Kafka Streams App

Your Kafka Streams Application



Kafka Streams



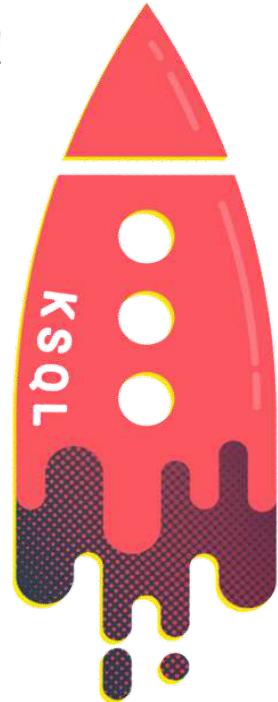


Confluent ksqlDB: Streaming SQL Engine for Apache Kafka

Develop real-time stream processing apps writing only SQL!

No Java, Python, or other boilerplate to wrap around it.

```
ksql> CREATE STREAM vip_actions AS  
        SELECT userid, page, action  
        FROM clickstream c  
        LEFT JOIN users u ON c.userid = u.user_id  
        WHERE u.level = 'Platinum';
```



Confluent ksqldb



Enable Stream Processing using SQL-like Semantics



Leverage Kafka Streams API without any coding required



Use any programming language

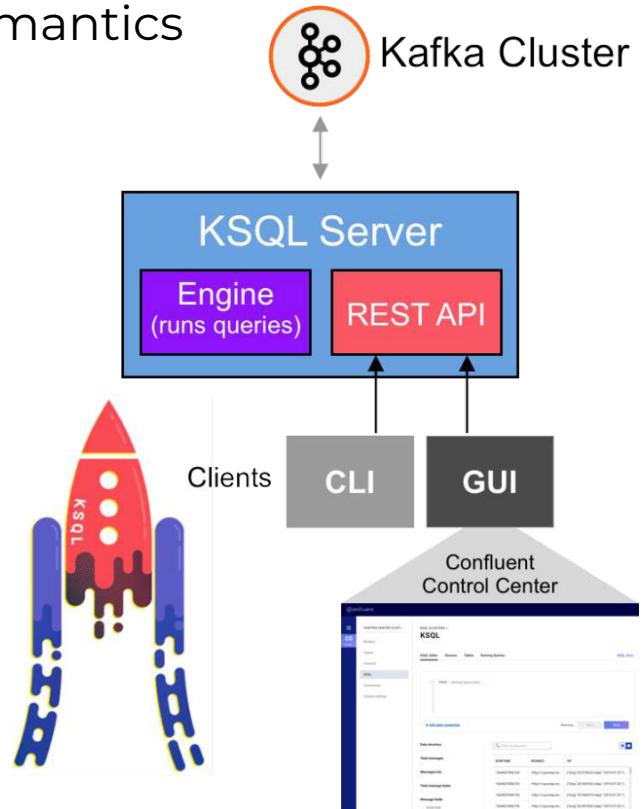


Connect via Control Center, CLI, REST, or headless



Example Use Cases

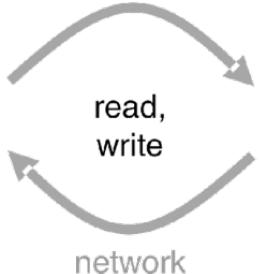
- Streaming ETL
- Anomaly detection
- Event monitoring



Confluent ksqlDB & Apache Kafka = easy



Kafka
(data)



KSQl
(processing)



CREATE STREAM
CREATE TABLE
SELECT ...and more...

Continue your Apache Kafka Education!



- Apache Kafka Administration by Confluent
- Confluent Developer Skills for Building Apache Kafka
- Confluent Stream Processing using Apache Kafka Streams and ksqlDB
- Confluent Advanced Skills for Optimizing Apache Kafka

For more details, see <http://confluent.io/training>



Certifications

Confluent Certified Developer for Apache Kafka

(aligns to Confluent Developer Skills for Building Apache Kafka course)

Confluent Certified Administrator for Apache Kafka

(aligns to Confluent Operations Skills for Apache Kafka)



What you Need to Know

- **Qualifications:** 6-to-9 months hands-on experience
- **Duration:** 90 mins
- **Availability:** Live, online 24/7
- **Cost:** \$150
- **Register online:**
www.confluent.io/certification





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