

The background of the slide features a light blue pattern of wavy lines, some solid and some dashed, with small blue dots scattered throughout, resembling a stylized map or network diagram.

# Kafka Connect

# Kafka Connect

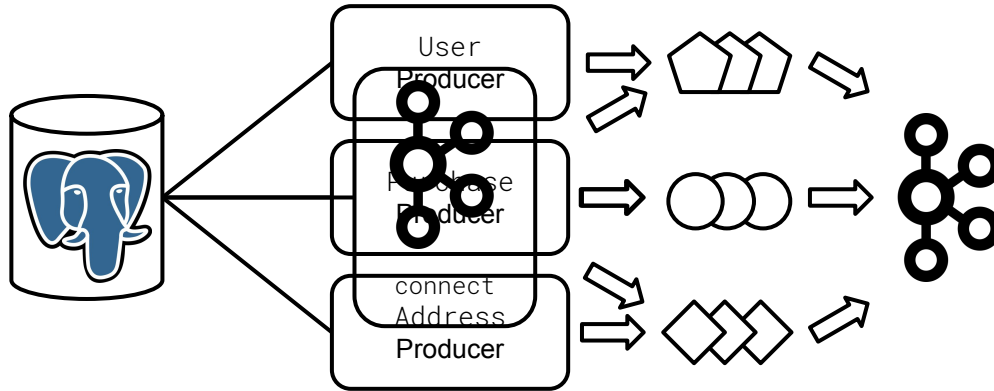
---

A **framework** and **web server** for reusable producers and consumers

- Built at Confluent, now with Apache Foundation
- Built in Java and Scala, runs on the JVM
- Can help promote reusability and keep code simple
- May not even need Kafka Client with Kafka Connect

# Kafka Connect

Example: Connect's SQL functionality can save significant effort



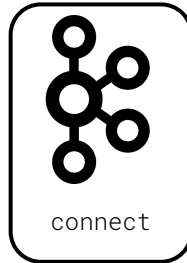
The background of the slide features a light blue pattern of wavy lines, some solid and some dashed, with small blue dots and 'x' marks scattered throughout, resembling a stylized map or network diagram.

# **Kafka Connect Architecture**

## How Kafka Connect Works

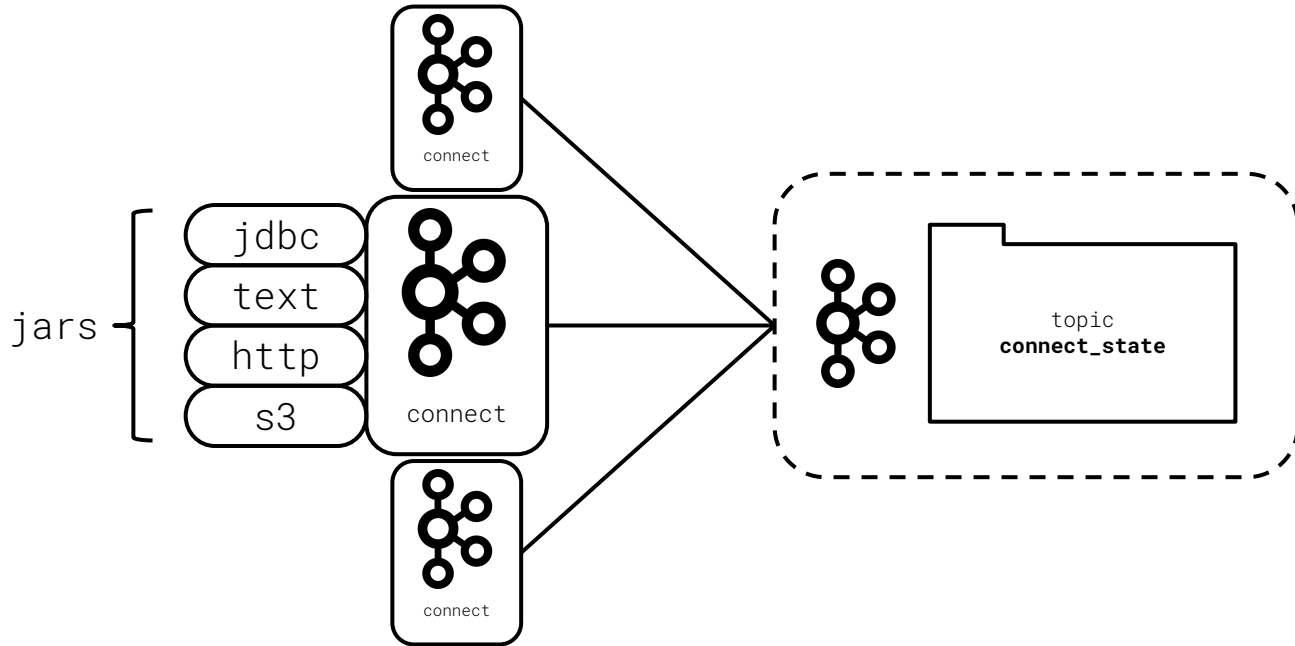
---

Kafka Connect, both webserver and framework, are built on the JVM



# How Kafka Connect Works

Kafka Connect, both webserver and framework, are built on the JVM



# The Connect Framework

---

## Components

- **Connectors** are abstractions for managing tasks
- **Tasks** contain the production or consumption code
- Kafka and target systems often have different formats
- **Converters** map data formats to and from Connect

The background of the slide features a light blue map-like pattern. It includes several solid blue lines of varying thicknesses that curve across the frame. Interspersed among these are dashed blue lines, some of which end in small 'x' marks. There are also several small, solid blue dots scattered throughout the background. A white rectangular box with a thin blue border is centered on the slide, containing the title text.

# **Kafka Connect Connectors**



The background of the slide features a light blue map-like pattern. It includes several solid blue lines of varying thicknesses that curve across the frame. Interspersed among these are dashed blue lines, some of which end in small 'x' marks. There are also several small, solid blue dots scattered across the map. A white rectangular box with a thin blue border is centered on the slide, containing the title text.

# **Kafka Connect Connectors**

# Kafka Connect Connectors

## Common Connectors

- **Local file source/sink**, ex: useful for logs
- **Cloud Key Value Store source/sink**, ex: AWS S3
- **JDBC source/sink**, ex: PostgreSQL, MySQL
- **HDFS source/sink**, ex: Interacting with Hadoop
- Visit Confluent's web repository for many more!

The background of the slide is a light blue map with various wavy lines, some solid and some dashed, and several small blue dots scattered across it. A white rectangular box with a blue border is centered on the slide, containing the title text.

# **The Kafka Connect API**

# Kafka Connect API

---

## API Capabilities

- Connect is entirely managed through a REST API
- Supports Create, Update, Delete, Read on Connectors
- Can add or remove plugins while server is running
- API aids in monitoring Connectors
- Does not surface logs or metrics

The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines that meander across the frame. Interspersed among these lines are small, solid blue dots and small 'x' marks, some of which are connected by short dashed lines, suggesting a network or a series of points of interest.

## **Working with the Kafka Connect API**

The background of the slide is a light blue map with various wavy lines, some solid and some dashed, and several small blue dots scattered across it. A white rectangular box with a blue border is centered on the slide.

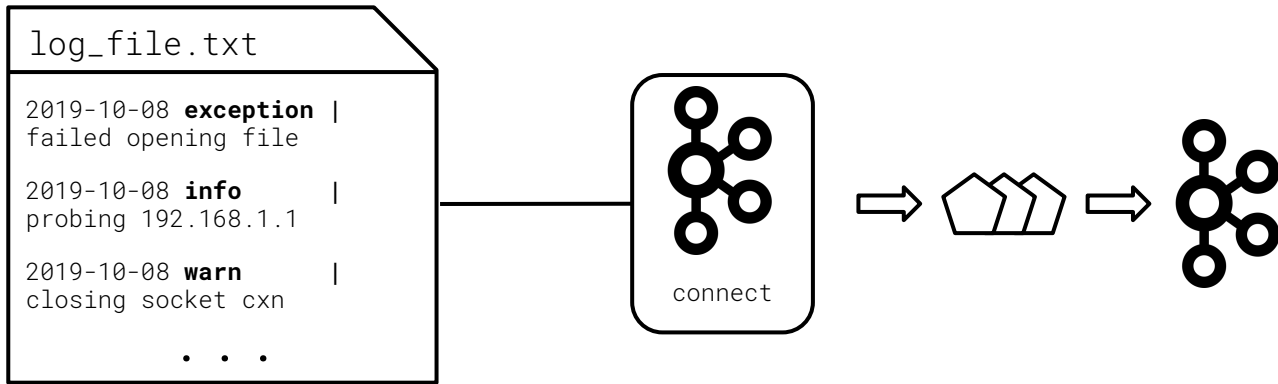
## **Demo: Connect API**

The background of the slide features a light blue map-like pattern. It includes several solid blue lines that curve across the frame, and several dashed blue lines, some of which end in small 'x' marks. There are also five solid blue dots scattered across the map: one on the left, one near the top center, one on the right, one near the bottom center, and one near the bottom right.

# Key Connectors

# Kafka Connect FileStream Source

FileStream Source connector **sends logs** as events to Kafka





The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines that meander across the frame. Interspersed among these lines are small, solid blue dots and faint, dashed blue lines, some of which end in small 'x' marks, suggesting a network or a series of points of interest.

## **Demo: Kafka Connect FileStream**

# JDBC Source/Sink

---

## Overview

- Uses standard Java SQL Interface (JDBC)
- JDBC Source puts data from a DB *into* Kafka
- JDBC sink takes data *out of* Kafka and into a DB
- Supports table whitelists, blacklists, custom queries
- Commonly used to publish model updates as events
- Commonly used to store Kafka events long term

The background of the slide features a light blue pattern of wavy lines, some solid and some dashed, with small blue dots scattered throughout, resembling a stylized map or network diagram.

## **Demo: Kafka Connect JDBC Source**

The background of the slide features a light blue pattern of wavy lines, some solid and some dashed, with small blue dots scattered throughout, resembling a stylized map or topographical chart.

## **Kafka REST Proxy**

# REST Proxy

---

## Overview

- Web server written in Java and Scala, runs on JVM
- May run as one instance or in a cluster
- Allows publish/consumption to Kafka over HTTP REST
- Cannot create topics, may only GET topic metadata
- Can be integrated with Schema Registry and use Avro
- Best in scenarios where you can't use a client library

The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines and dashed blue lines. Small blue dots are placed at various points along these lines, and small 'x' marks are scattered across the background.

## **Demo: Fetching Cluster Metadata from REST Proxy**

The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines that meander across the frame. Interspersed among these lines are small, light blue 'x' marks and solid blue dots. Some of the 'x' marks are connected to the lines by short, dashed blue segments. The overall effect is a clean, minimalist, and technical aesthetic.

## Using REST Proxy

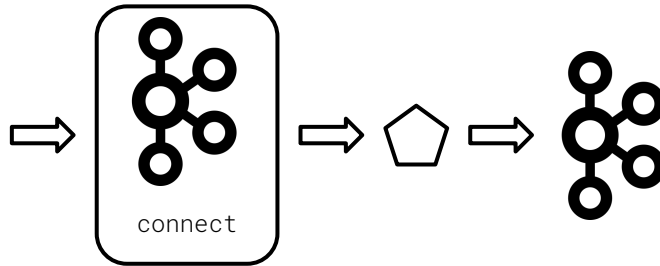
# Producing Data with REST Proxy

POST data to Kafka REST Proxy to produce data

```
POST /topics/<topic_name>
```

```
Content-Type:  
application/vnd.kafka.json.v2+json
```

```
{  
  "records": [  
    {"value": {"user": "123"}},  
    {"value": {"user": "456"}},  
  ]  
}
```





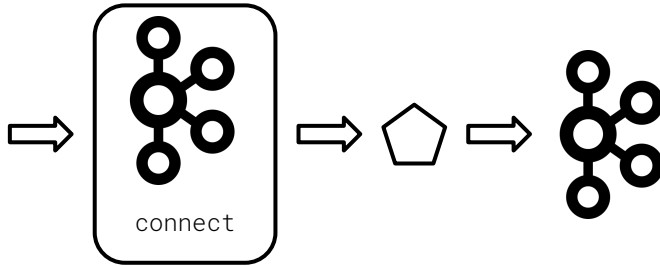
# Producing Data with REST Proxy

Avro data may be published but you must always **include the schema**

```
POST /topics/<topic_name>
```

```
Content-Type:  
application/vnd.kafka.avro.v2+json
```

```
{  
  "value_schema": "{\\"type\\": \\"r...",  
  "records": [  
    {"value": {"user": 123},  
    {"value": {"user": 456},  
  ]  
}
```



## Producing Data with REST Proxy

---

**Always** make sure you have the right Content-Type Header!

Data Serialization Format	Content-Type Header
Binary (Base64-encoded String, etc)	<code>application/vnd.kafka.<b>binary</b>.v2+json</code>
JSON	<code>application/vnd.kafka.<b>json</b>.v2+json</code>
Avro	<code>application/vnd.kafka.<b>avro</b>.v2+json</code>

The background of the slide features a light blue map-like pattern. It includes several solid blue lines of varying thicknesses that curve across the frame. Interspersed among these are dashed blue lines, some of which end in small 'x' marks. There are also several solid blue dots scattered throughout the map. A white rectangular box with a thin blue border is centered on the slide, containing the title text.

## **Demo: Producing JSON Data with REST Proxy**

The background of the slide features a light blue map-like pattern. It includes several solid blue lines that curve across the frame, and dashed blue lines that also curve. Small blue dots are placed at various points along these lines. Additionally, there are small 'x' marks scattered across the background, some of which are also connected by dashed lines.

## **Demo: Producing Avro Data with REST Proxy**

# Consuming Data with REST Proxy

Consumption begins with a POST to create a Consumer Group

POST /consumers/<group_name> HTTP 1.1 200 OK
Content-Type: application/vnd.kafka.v2+json
{ "instance_id": "<consumer_name>", "base_uri": "http://<rest_uri>" } { "name": "<consumer_name>", "format": "<binary/json/avro>", }



# Consuming Data with REST Proxy

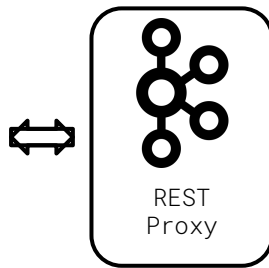
Next, POST to the subscribe endpoint

```
POST /consumers/<group_name>/instances/<instance_id>/subscription
```

```
Content-Type: application/vnd.kafka.v2+json
```

```
HTTP/1.1 204 No Content
```

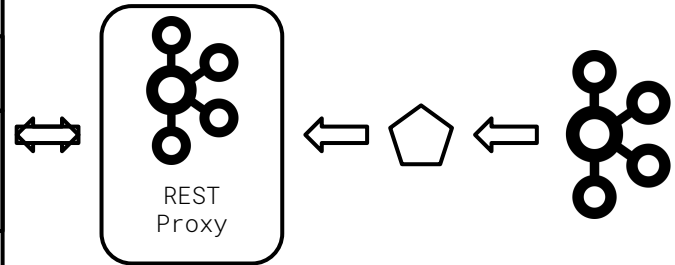
```
{  
  "topics": [  
    "<topic_0>",  
    "<topic_1>",  
    ...  
    "<topic_n>"  
  ]  
}
```



# Consuming Data with REST Proxy

Once the consumer is subscribed, we can use HTTP GET to fetch records

HTTP 1.1 200 OK
[
{
GET /consumers<groupname>/instances/<instance_id>/records
"key": "<key>",
"value": "<value>",
Accept: application/vnd.kafka.json.v2+json
"offset": <offset>
}, {
...
}
]



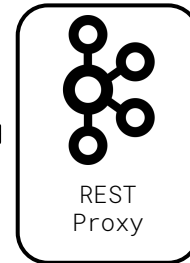
# Consuming Data with REST Proxy

DELETE your consumer subscription when shutting down

```
DELETE /consumers/<group_name>/instances/<instance_id>/subscription
```

```
HTTP 1.1 204 No Content
```

```
Accept: application/vnd.kafka.v2+json
```





The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines that meander across the frame. Interspersed among these lines are small, solid blue dots and small 'x' marks, some of which are connected by short dashed lines, suggesting a network or a series of points of interest.

## **Demo: Consuming JSON Data with REST Proxy**

The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines that meander across the frame. Interspersed among these lines are small, light blue 'x' marks and solid blue dots. Some of the 'x' marks are connected to the lines by short, dashed blue segments. The overall aesthetic is clean and modern, resembling a technical or geographical diagram.

## **Demo: Consuming Avro Data with REST Proxy**

The background of the slide features a light blue map-like pattern. It consists of several wavy, solid blue lines and dashed blue lines. Small blue dots are placed at various points along these lines, and small blue 'x' marks are scattered across the background.

# Summary