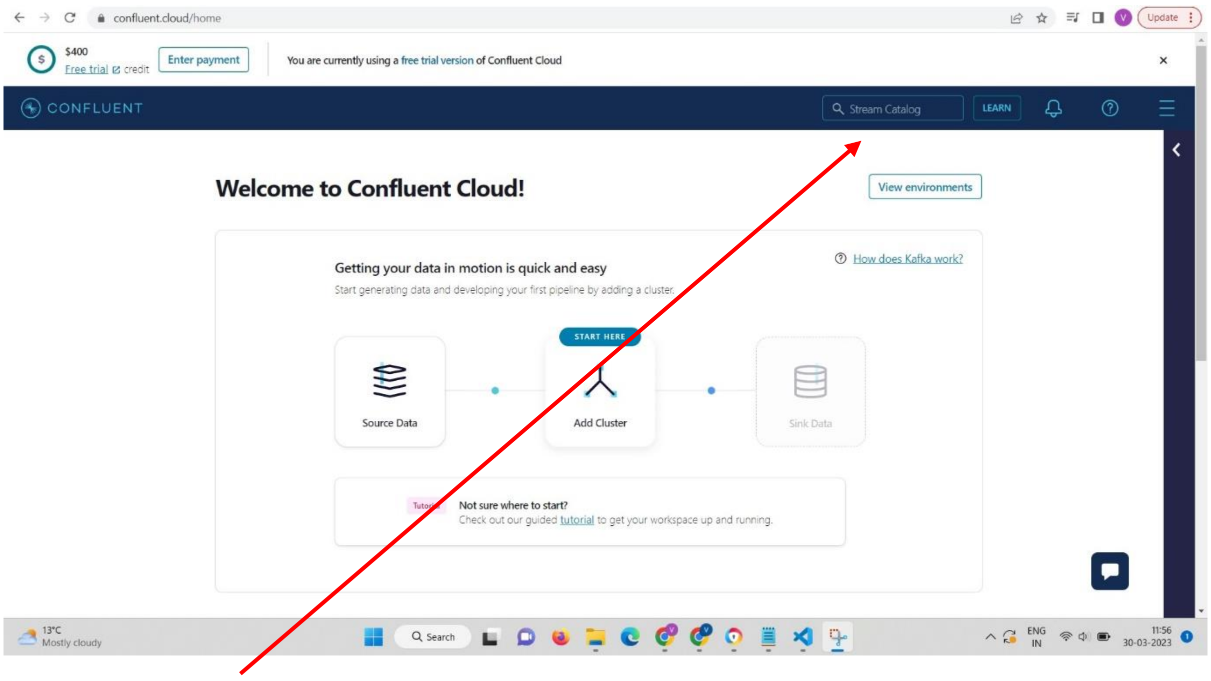
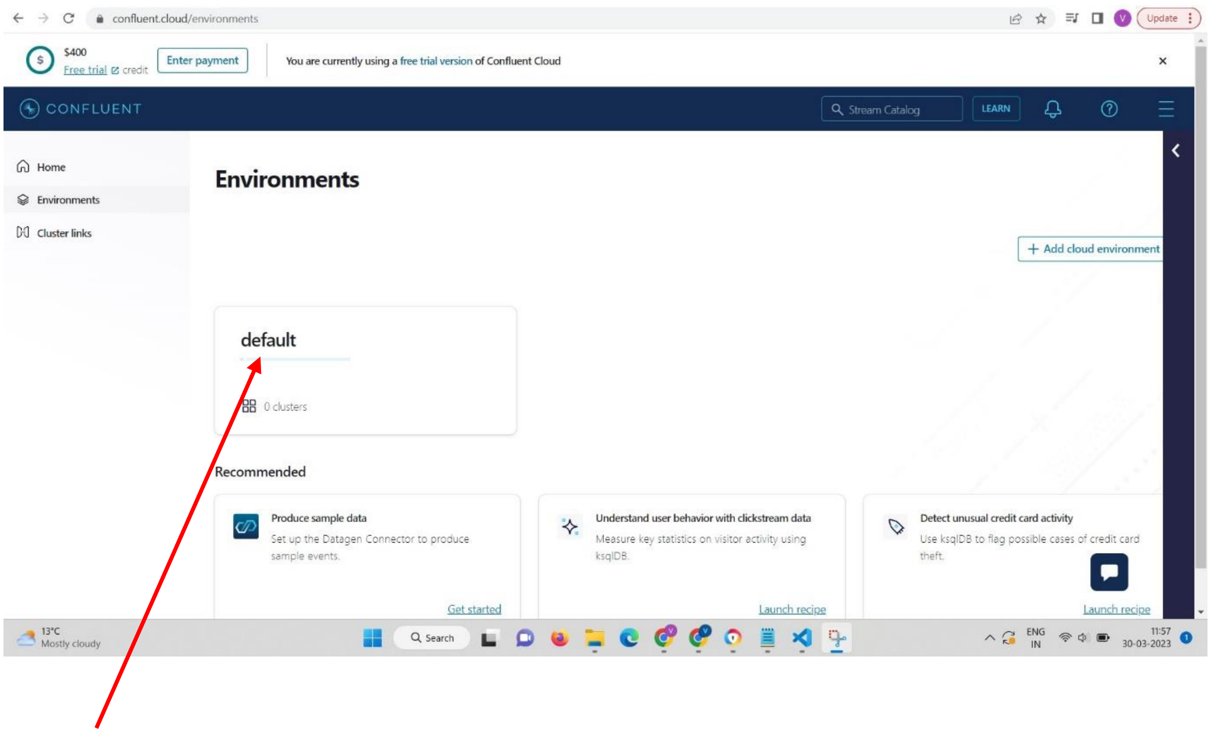
Kafka code 1:


confluent.cloud/home
$400
Free trial credit
Enter payment
You are currently using a free trial version of Confluent Cloud
CONFLUENT
Stream Catalog
LEARN
Welcome to Confluent Cloud!
View environments
Getting your data in motion is quick and easy
Start generating data and developing your first pipeline by adding a cluster.
How does Kafka work?
START HERE
Source Data
Add Cluster
Sink Data
Not sure where to start?
Check out our guided tutorial to get your workspace up and running.
13°C Mostly cloudy
Search
ENG IN
11:56 30-03-2023

Click on view environments.


confluent.cloud/environments
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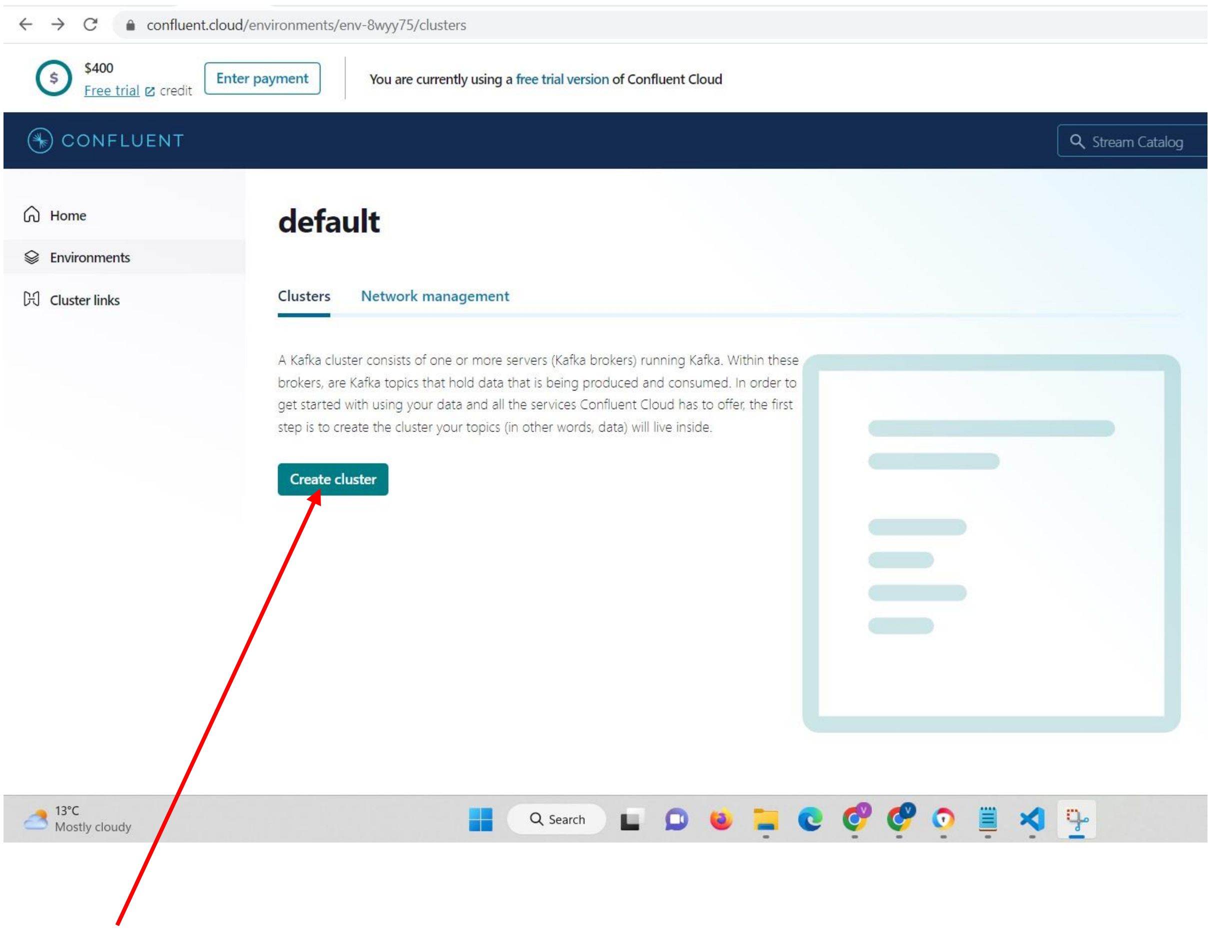
CONFLUENT
Stream Catalog
LEARN
Home
Environments
Cluster links
Environments
Add cloud environment
default
0 clusters
Recommended
Produce sample data
Set up the Datagen Connector to produce sample events.
Get started
Understand user behavior with clickstream data
Measure key statistics on visitor activity using ksqlDB.
Launch recipe
Detect unusual credit card activity
Use ksqlDB to flag possible cases of credit card theft.
Launch recipe
13°C Mostly cloudy
Search
ENG IN
11:57 30-03-2023

Click on default.


confluent.cloud/environments/env-8wyy75/clusters

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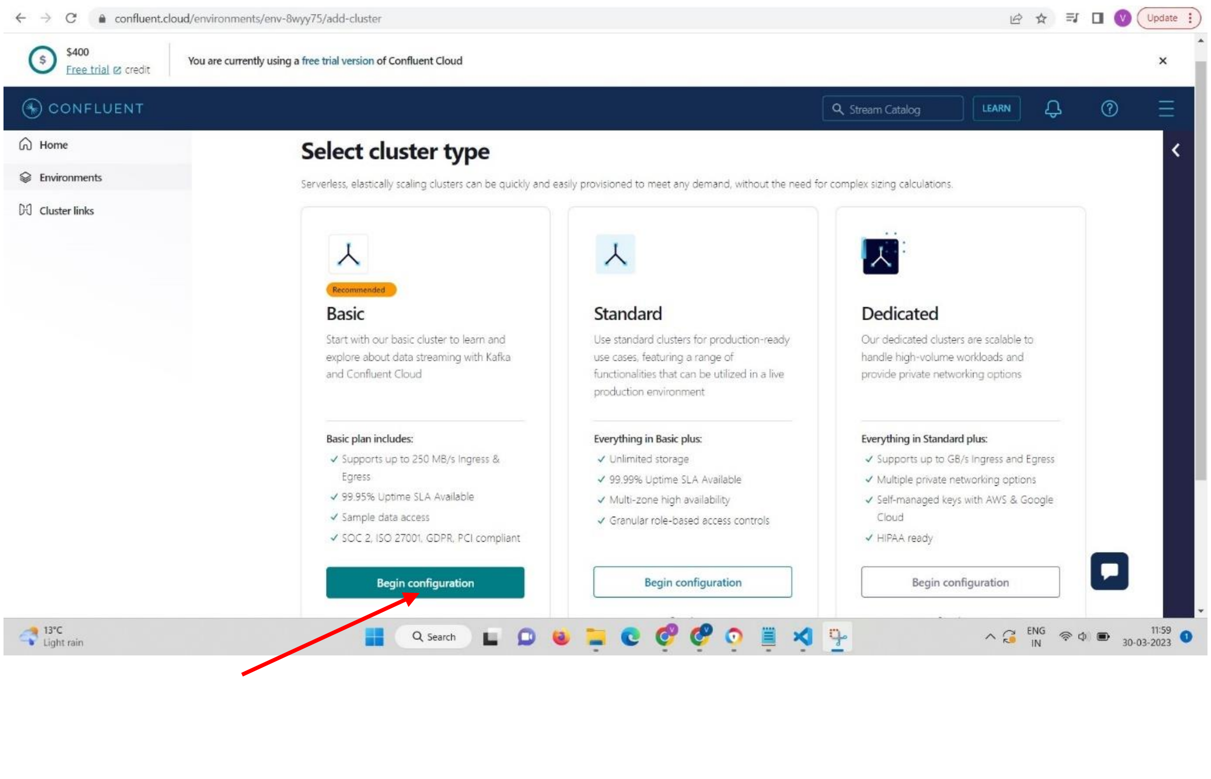
default

A Kafka cluster consists of one or more servers (Kafka brokers) running Kafka. Within these brokers, are Kafka topics that hold data that is being produced and consumed. In order to get started with using your data and all the services Confluent Cloud has to offer, the first step is to create the cluster your topics (in other words, data) will live inside.

Click on create cluster.


confluent.cloud/environments/env-8wyy75/add-cluster

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Select cluster type

Serverless, elastically scaling clusters can be quickly and easily provisioned to meet any demand, without the need for complex sizing calculations.

Recommended

Basic

Start with our basic cluster to learn and explore about data streaming with Kafka and Confluent Cloud

Basic plan includes:
- ✓ Supports up to 250 MB/s Ingress & Egress
- ✓ 99.95% Uptime SLA Available
- ✓ Sample data access
- ✓ SOC 2, ISO 27001, GDPR, PCI compliant

Standard

Use standard clusters for production-ready use cases, featuring a range of functionalities that can be utilized in a live production environment

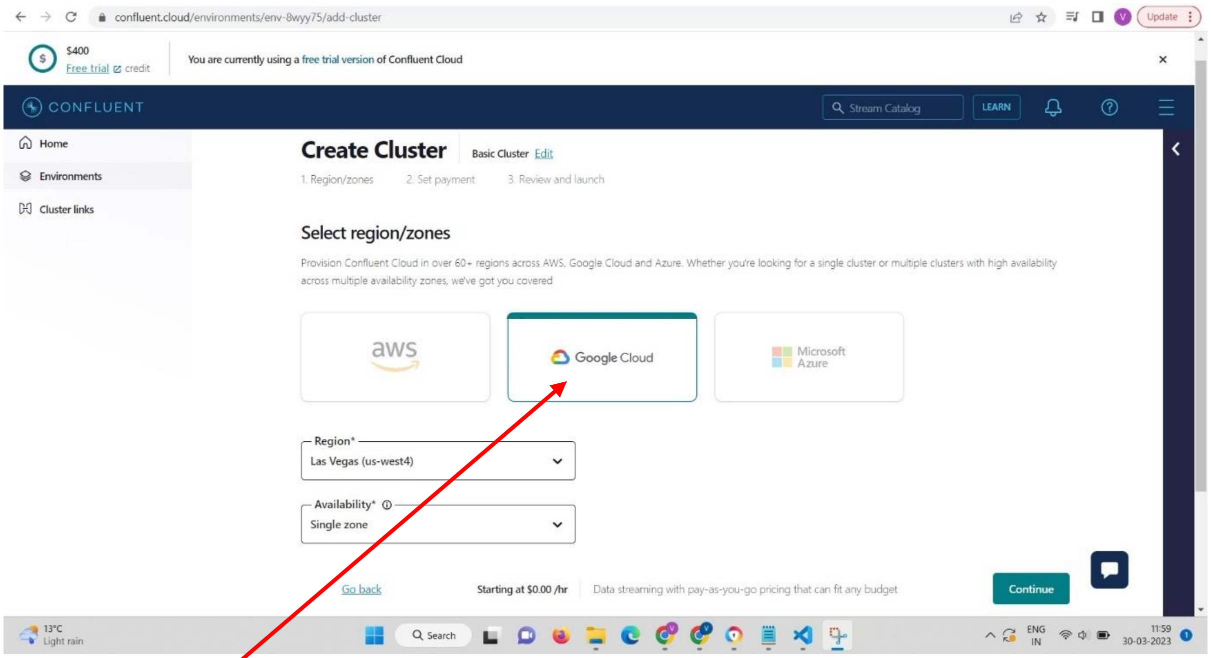
Everything in Basic plus:
- ✓ Unlimited storage
- ✓ 99.99% Uptime SLA Available
- ✓ Multi-zone high availability
- ✓ Granular role-based access controls

Dedicated

Our dedicated clusters are scalable to handle high-volume workloads and provide private networking options

Everything in Standard plus:
- ✓ Supports up to GB/s Ingress and Egress
- ✓ Multiple private networking options
- ✓ Self-managed keys with AWS & Google Cloud
- ✓ HIPAA ready

Click on begin configuration.


confluent.cloud/environments/env-8wyy75/add-cluster

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Create Cluster Basic Cluster Edit

1. Region/zones 2. Set payment 3. Review and launch

Select region/zones

Provision Confluent Cloud in over 60+ regions across AWS, Google Cloud and Azure. Whether you're looking for a single cluster or multiple clusters with high availability across multiple availability zones, we've got you covered

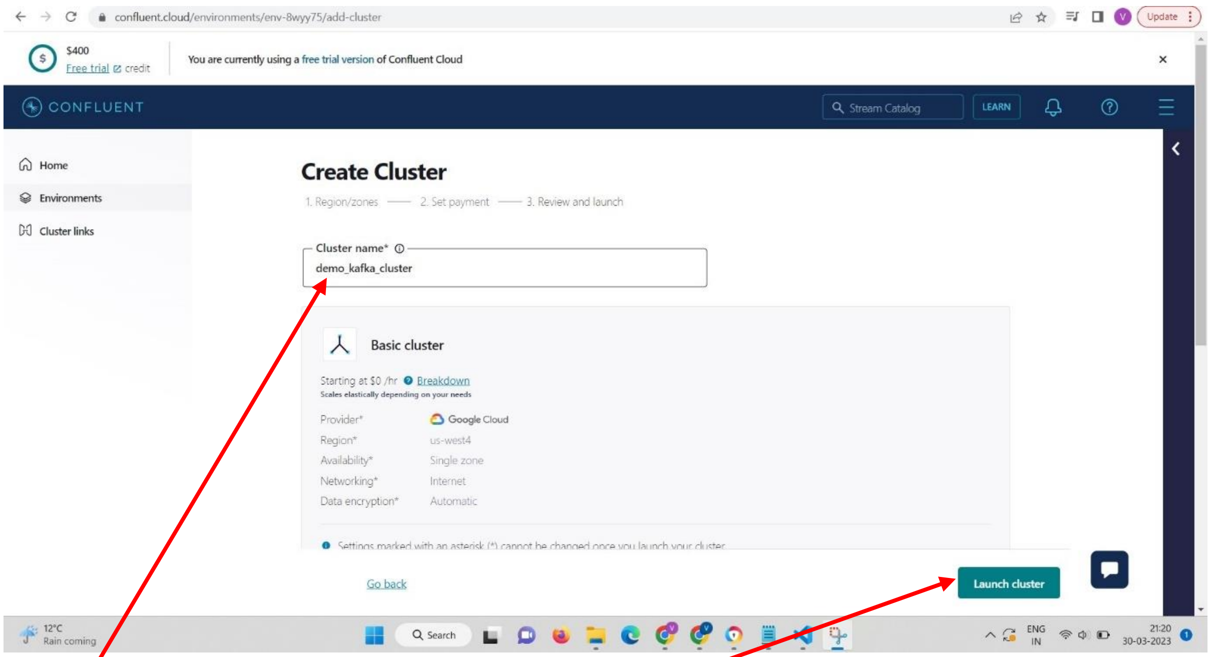
Region*: Las Vegas (us-west4)

Availability*: Single zone

Go back Starting at $0.00 /hr Data streaming with pay-as-you-go pricing that can fit any budget Continue

Click on Google Cloud.

Note: Any cloud platform can be used.


confluent.cloud/environments/env-8wyy75/add-cluster

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Create Cluster

1. Region/zones 2. Set payment 3. Review and launch

Cluster name*: demo_kafka_cluster

Basic cluster

Starting at $0 /hr Breakdown

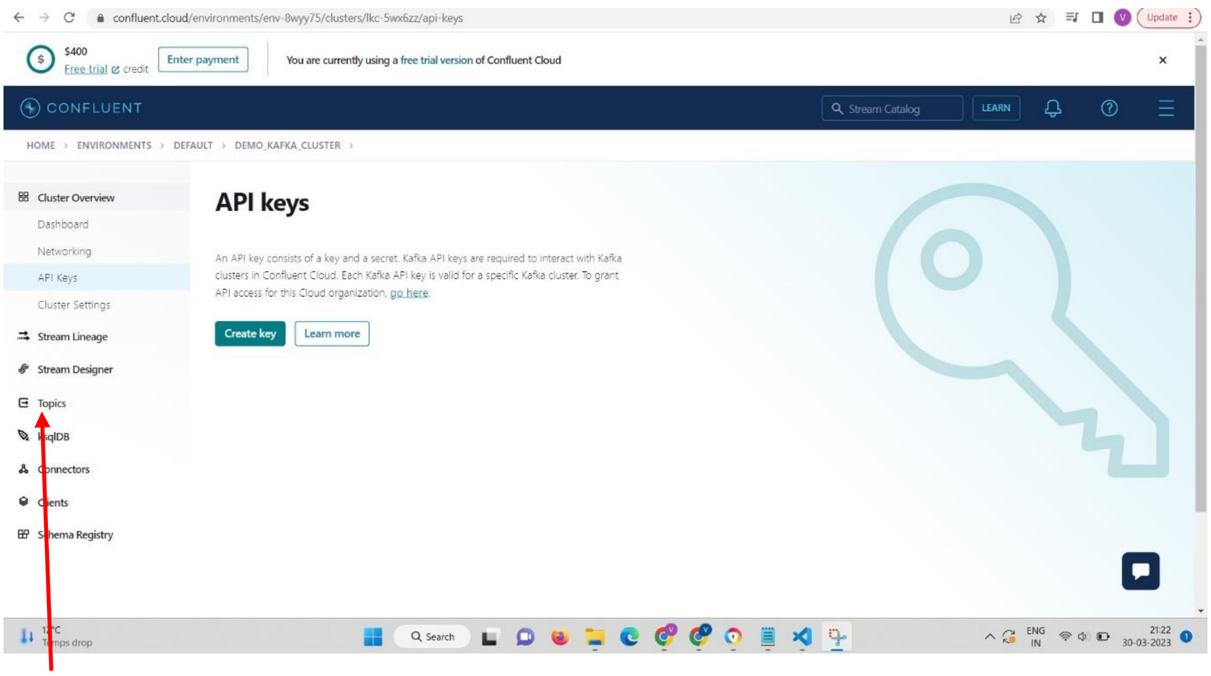
Scales elastically depending on your needs

Provider*	Google Cloud
Region*	us-west4
Availability*	Single zone
Networking*	Internet
Data encryption*	Automatic

Settings marked with an asterisk (*) cannot be changed once you launch your cluster

Go back Launch cluster

Edit the cluster name and click on the launch cluster.


confluent.cloud/environments/env-8wyy75/clusters/lkc-5wx6zz/api-keys

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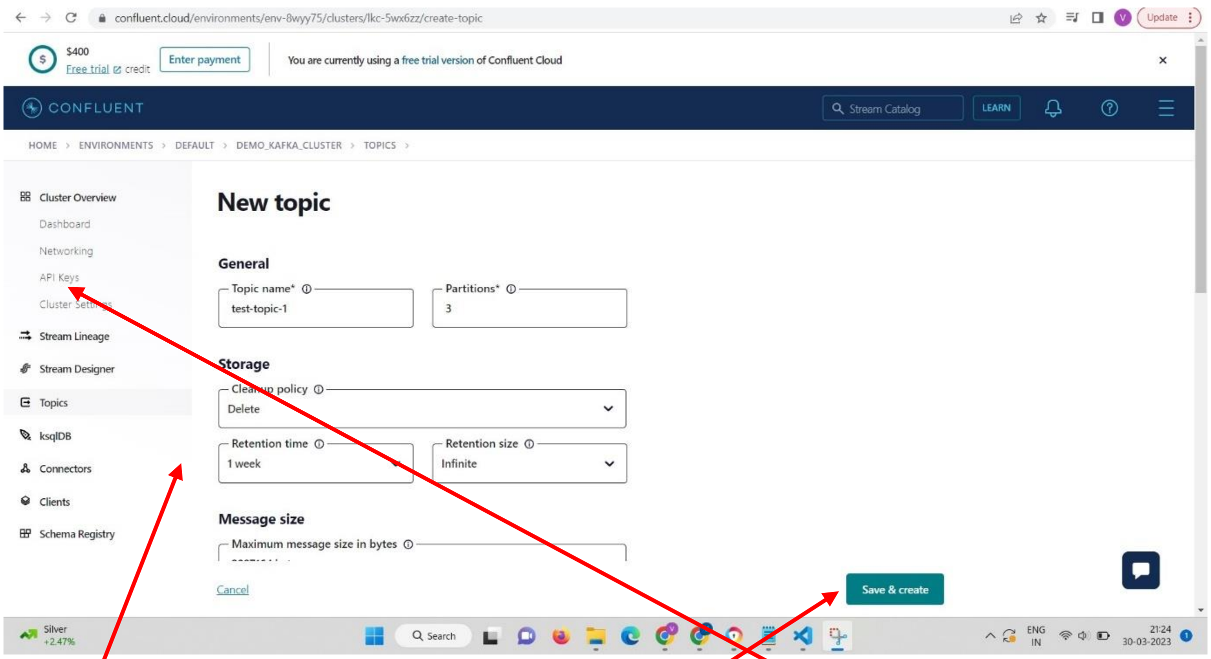
HOME › ENVIRONMENTS › DEFAULT › DEMO_KAFKA_CLUSTER ›

API keys

An API key consists of a key and a secret. Kafka API keys are required to interact with Kafka clusters in Confluent Cloud. Each Kafka API key is valid for a specific Kafka cluster. To grant API access for this Cloud organization, go here.

Click on the topics.


confluent.cloud/environments/env-8wyy75/clusters/lkc-5wx6zz/create-topic

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HOME › ENVIRONMENTS › DEFAULT › DEMO_KAFKA_CLUSTER › TOPICS ›

New topic

General

Topic name*: test-topic-1

Partitions*: 3

Storage

Cleanup policy: Delete

Retention time: 1 week

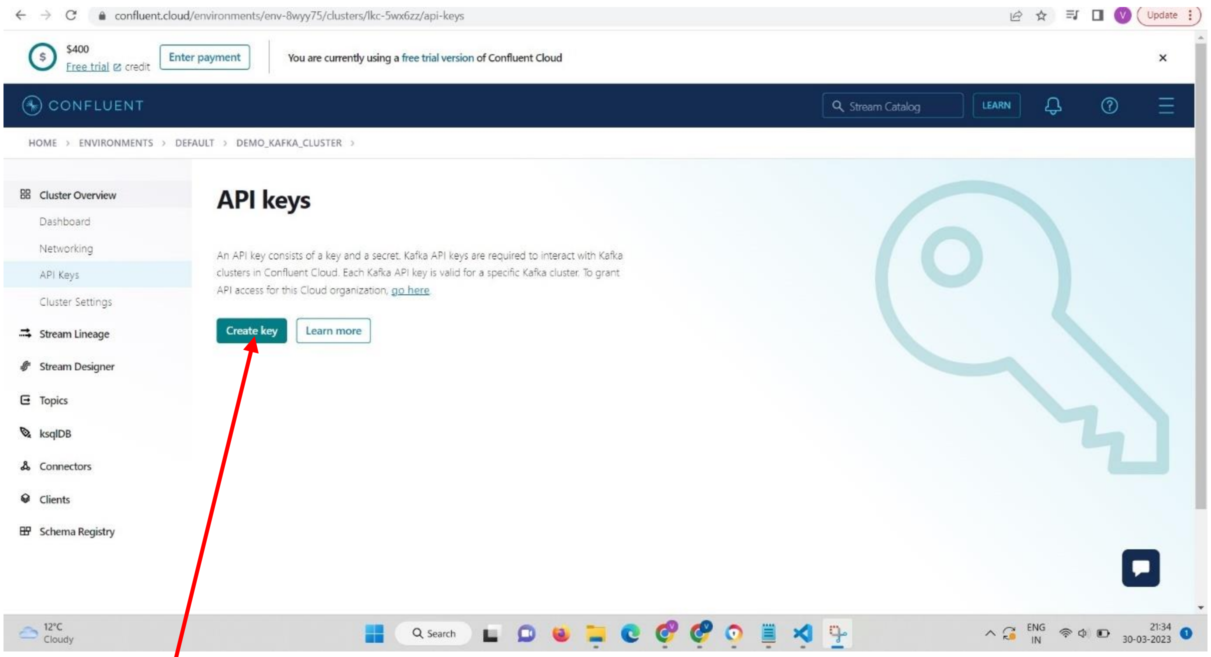
Retention size: Infinite

Message size

Maximum message size in bytes

Change the topic configurations. Then click on save & create. The click on API keys.

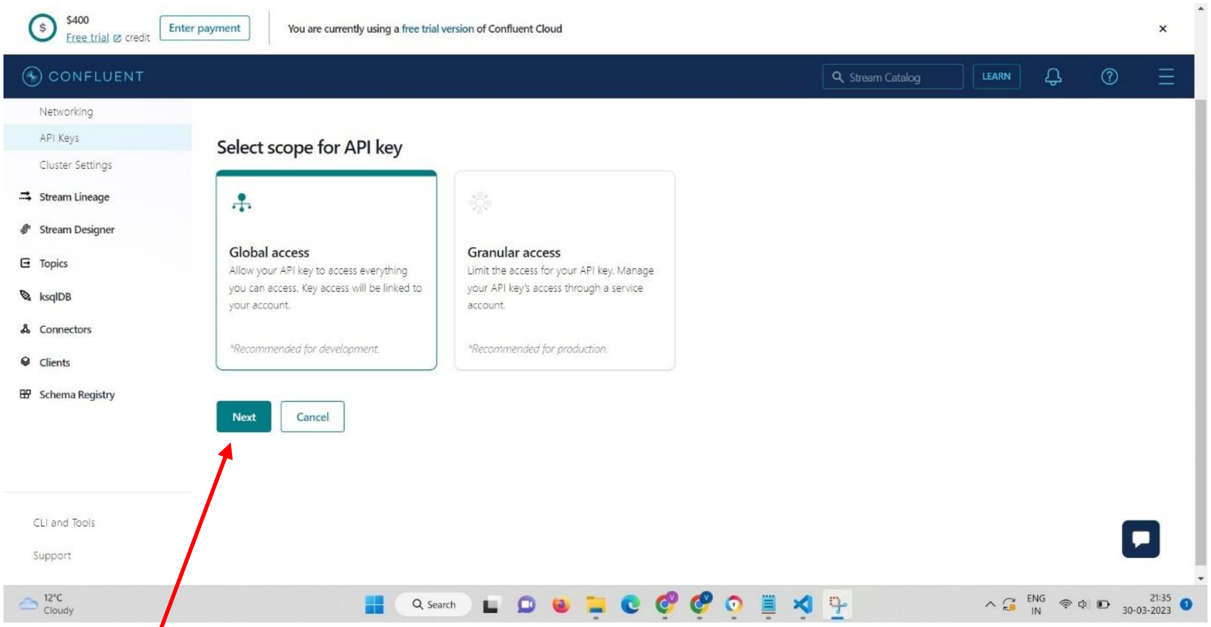
Note: In the program the name is test_topic.



API keys

An API key consists of a key and a secret. Kafka API keys are required to interact with Kafka clusters in Confluent Cloud. Each Kafka API key is valid for a specific Kafka cluster. To grant API access for this Cloud organization, go here

Click on create key.

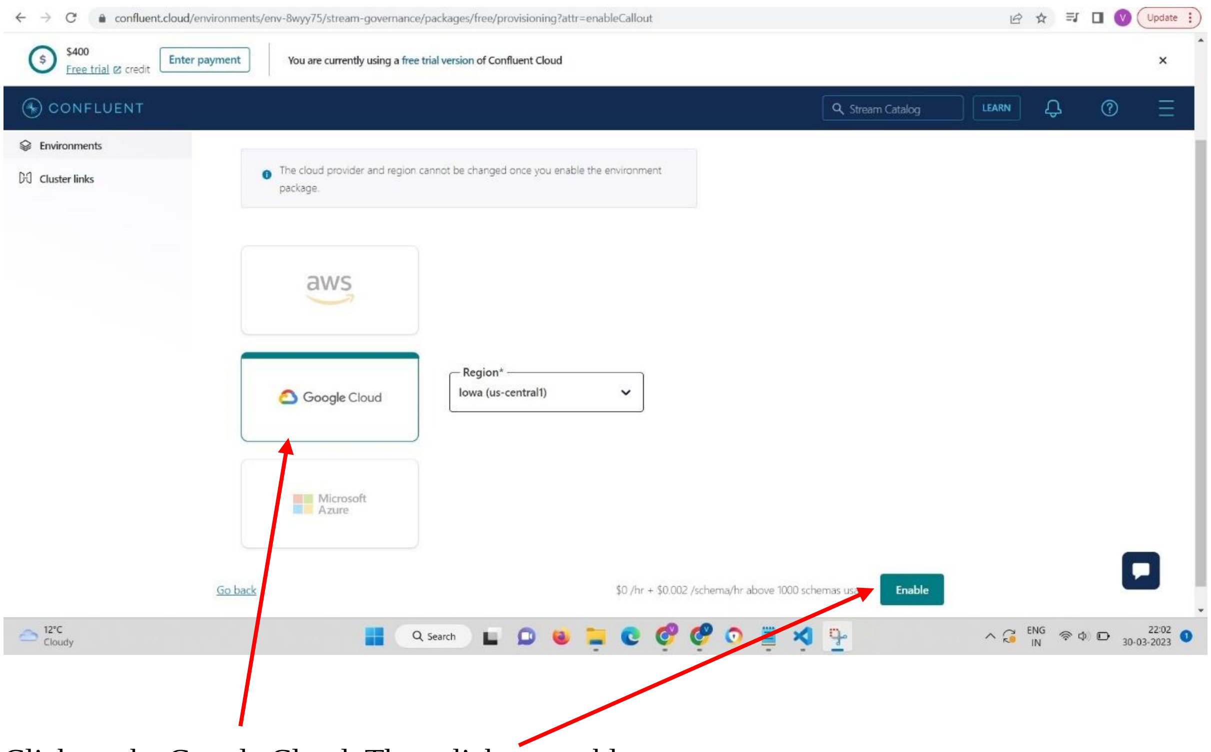


Select scope for API key

Global access
Allow your API key to access everything you can access. Key access will be linked to your account.
*Recommended for development.

Granular access
Limit the access for your API key. Manage your API key's access through a service account.
*Recommended for production.

Select Global access and click on Next. After this api keys will be displayed. In that write description (kafka access keys) this description can be anything. Then click on download and continue.


confluent.cloud/environments/env-8wyy75/stream-governance/packages/free/provisioning?attr=enableCallout

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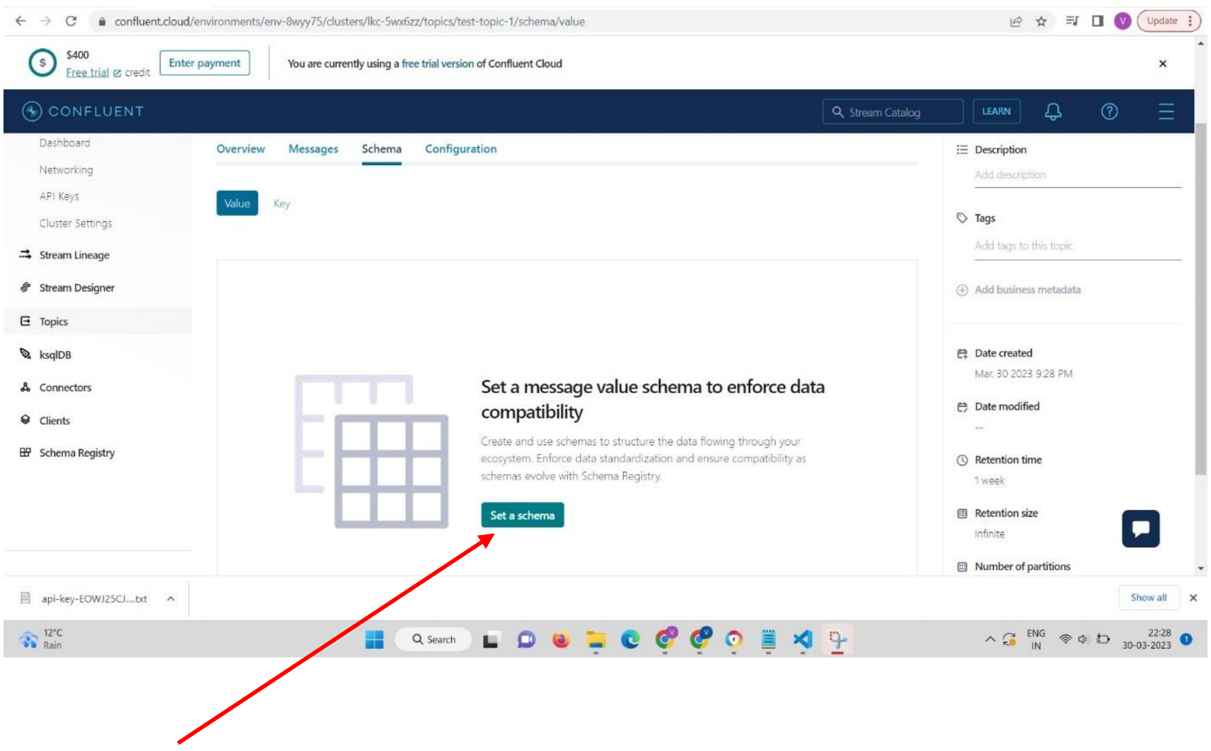
The cloud provider and region cannot be changed once you enable the environment package.

Region* Iowa (us-central1)

$0 /hr + $0.002 /schema/hr above 1000 schemas us

Click on the Google Cloud. Then click on enable.

Note: Choice of cloud platform can be anything.


confluent.cloud/environments/env-8wyy75/clusters/lkc-5wx6zz/topics/test-topic-1/schema/value

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Set a message value schema to enforce data compatibility

Create and use schemas to structure the data flowing through your ecosystem. Enforce data standardization and ensure compatibility as schemas evolve with Schema Registry.

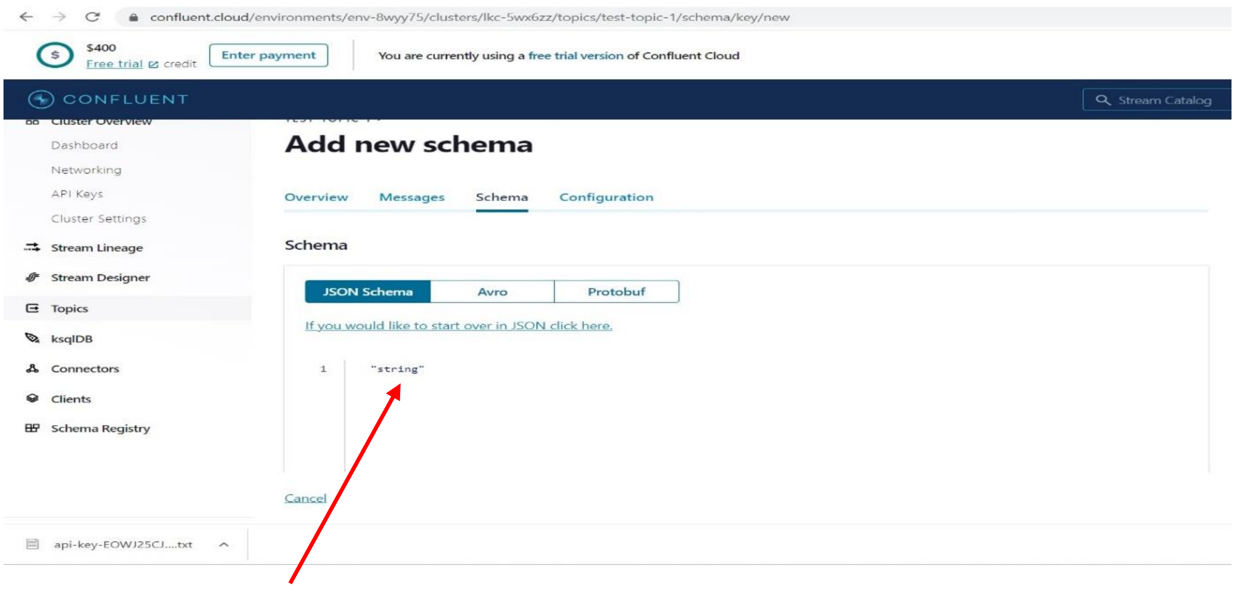
Date created: Mar. 30 2023 9:28 PM
Date modified: --
Retention time: 1 week
Retention size: Infinite

Click on Set a schema for value side. Then click on the JSON Schema and copy paste the below code:

```
{
  "$id": "http://example.com/myURI.schema.json",
  "$schema": "http://json-schema.org/draft-07/schema#",
  "additionalProperties": false,
  "description": "Sample schema to help you get started.",
  "properties": {
    "brand": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "car_name": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "engine": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "fuel_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "km_driven": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "max_power": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "mileage": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "model": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "seats": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "seller_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "selling_price": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "transmission_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "vehicle_age": {
      "description": "The type(v) type is used.",
      "type": "number"
    }
  },
  "title": "SampleRecord",
  "type": "object"
}
```

Code explanation:

This is a JSON schema that defines the structure and data types of a data record for a car selling platform. The schema includes a title, description, and additional Properties set to false, which means that only the properties explicitly defined in the schema can be present in a data record, and no additional properties are allowed. The schema defines an object with 12 properties, including "brand", "car_name", "engine", "fuel_type", "km_driven", "max_power", "mileage", "model", "seats", "seller_type", "selling_price", "transmission_type", and "vehicle_age". Each property has a description that provides information about the data type expected, such as "string" or "number". Overall, this schema can be used to validate and ensure the consistency of data records for a car selling platform, ensuring that the data conforms to a specific structure and data types.


confluent.cloud/environments/env-8wyy75/clusters/lkc-5wx6zz/topics/test-topic-1/schema/key/new

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Add new schema

```
"string"
```

For key side type “string” in the JSON Schema.

Install following python packages in the terminal.

1. pip3 install confluent_kafka
2. pip3 install pandas
3. pip3 install requests
4. pip3 install jsonschema

Python producer code:

```
#!/usr/bin/env python
# -*- coding: utf-8 -*-
#
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# distributed under the License is distributed on an "AS IS" BASIS,
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
# See the License for the specific language governing permissions and
# limitations under the License.


# A simple example demonstrating use of JSONSerializer.
```

```python
import argparse
from uuid import uuid4
from six.moves import input
from confluent_kafka import Producer
from confluent_kafka.serialization import StringSerializer,
SerializationContext, MessageField
from confluent_kafka.schema_registry import SchemaRegistryClient
from confluent_kafka.schema_registry.json_schema import JSONSerializer
#from confluent_kafka.schema_registry import *
import pandas as pd
from typing import List

FILE_PATH = "your file path for the dataset"
columns=['car_name', 'brand', 'model', 'vehicle_age', 'km_driven',
'seller_type',
       'fuel_type', 'transmission_type', 'mileage', 'engine', 'max_power',
       'seats', 'selling_price']

API_KEY = 'your api key'
ENDPOINT_SCHEMA_URL  = 'your endpoint schema url'
API_SECRET_KEY = 'your api secret key'
BOOTSTRAP_SERVER = 'your bootstrap server'
SECURITY_PROTOCOL = 'SASL_SSL'
SSL_MACHENISM = 'PLAIN'
SCHEMA_REGISTRY_API_KEY = 'your schema registry api key'
SCHEMA_REGISTRY_API_SECRET = 'your schema registry api secret'


def sasl_conf():

    sasl_conf = {'sasl.mechanism': SSL_MACHENISM,
                 # Set to SASL_SSL to enable TLS support.
                #  'security.protocol': 'SASL_PLAINTEXT'}
                'bootstrap.servers':BOOTSTRAP_SERVER,
                'security.protocol': SECURITY_PROTOCOL,
                'sasl.username': API_KEY,
                'sasl.password': API_SECRET_KEY
                }
    return sasl_conf



def schema_config():
    return {'url':ENDPOINT_SCHEMA_URL,

    'basic.auth.user.info':f"{SCHEMA_REGISTRY_API_KEY}:{SCHEMA_REGISTRY_API_SE
CRET}"
```

```python
    }


class Car:
    def __init__(self,record:dict):
        for k,v in record.items():
            setattr(self,k,v)

        self.record=record

    @staticmethod
    def dict_to_car(data:dict,ctx):
        return Car(record=data)

    def __str__(self):
        return f"{self.record}"


def get_car_instance(file_path):
    df=pd.read_csv(file_path)
    df=df.iloc[:,1:]
    cars:List[Car]=[]
    for data in df.values:
        car=Car(dict(zip(columns,data)))
        cars.append(car)
        yield car

def car_to_dict(car:Car, ctx):
    """
    Returns a dict representation of a User instance for serialization.
    Args:
        user (User): User instance.
        ctx (SerializationContext): Metadata pertaining to the serialization
            operation.
    Returns:
        dict: Dict populated with user attributes to be serialized.
    """

    # User._address must not be serialized; omit from dict
    return car.record


def delivery_report(err, msg):
    """
    Reports the success or failure of a message delivery.
    Args:
        err (KafkaError): The error that occurred on None on success.
        msg (Message): The message that was produced or failed.
    """
    if err is not None:
        print("Delivery failed for User record {}: {}".format(msg.key(), err))
        return
    print('User record {} successfully produced to {} [{}] at offset
{}'.format(
        msg.key(), msg.topic(), msg.partition(), msg.offset()))


def main(topic):

    schema_str = """
    {
  "$id": "http://example.com/myURI.schema.json",
  "$schema": "http://json-schema.org/draft-07/schema#",
  "additionalProperties": false,
  "description": "Sample schema to help you get started.",
  "properties": {
    "brand": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "car_name": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "engine": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "fuel_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "km_driven": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "max_power": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "mileage": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "model": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "seats": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "seller_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "selling_price": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "transmission_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "vehicle_age": {
      "description": "The type(v) type is used.",
      "type": "number"
    }
  },
  "title": "SampleRecord",
  "type": "object"
}
    """
    schema_registry_conf = schema_config()
    schema_registry_client = SchemaRegistryClient(schema_registry_conf)

    string_serializer = StringSerializer('utf_8')
    json_serializer = JSONSerializer(schema_str, schema_registry_client,
car_to_dict)

    producer = Producer(sasl_conf())

    print("Producing user records to topic {}. ^C to exit.".format(topic))
    #while True:
        # Serve on_delivery callbacks from previous calls to produce()
    producer.poll(0.0)
    try:
        for car in get_car_instance(file_path=FILE_PATH):

            print(car)
            producer.produce(topic=topic,
                            key=string_serializer(str(uuid4()), car_to_dict),
                            value=json_serializer(car,
SerializationContext(topic, MessageField.VALUE)),
                            on_delivery=delivery_report)
    except KeyboardInterrupt:
        pass
    except ValueError:
        print("Invalid input, discarding record...")
        pass

    print("\nFlushing records...")
    producer.flush()

main("test_topic")
```

This is a Python script that demonstrates the use of Confluent Kafka Python library for producing JSON-serialized messages to a Kafka topic. The code is specifically designed for a sample dataset from Cardekho, where each record represents a car for sale. The script starts by defining the required configuration settings for Kafka, including API keys, endpoint URLs, and security protocols. It then defines a Car class that represents a single record in the Cardekho dataset. The get_car_instance function reads the dataset from a CSV file, creates instances of the Car class for each record, and yields them for use in producing messages. The car_to_dict function is used to serialize instances of the Car class into a JSON-serializable dictionary format. This function is used by the JSON Serializer object to convert Python objects into JSON-formatted strings that can be sent to Kafka. The main function initializes the Kafka producer, creates an instance of the JSON Serializer, and produces messages to a specified Kafka topic. The delivery_report function is used to report the success or failure of message delivery. Overall, this code demonstrates how to use the Confluent Kafka Python library to produce JSON-serialized messages to a Kafka topic, using a schema and serialization configuration provided by the Confluent Schema Registry.

Python consumer code:

```
import argparse

from confluent_kafka import Consumer
from confluent_kafka.serialization import SerializationContext, MessageField
from confluent_kafka.schema_registry.json_schema import JSONDeserializer


API_KEY = 'your api key'
ENDPOINT_SCHEMA_URL  = 'your endpoint schema url'
API_SECRET_KEY = 'your api secret key'
BOOTSTRAP_SERVER = 'your bootstrap server'
SECURITY_PROTOCOL = 'SASL_SSL'
SSL_MACHENISM = 'PLAIN'
SCHEMA_REGISTRY_API_KEY = 'your schema registry api key'
SCHEMA_REGISTRY_API_SECRET = 'your schema registry api secret'
```

```
def sasl_conf():

    sasl_conf = {'sasl.mechanism': SSL_MACHENISM,
                 # Set to SASL_SSL to enable TLS support.
                #  'security.protocol': 'SASL_PLAINTEXT'}
                'bootstrap.servers':BOOTSTRAP_SERVER,
                'security.protocol': SECURITY_PROTOCOL,
                'sasl.username': API_KEY,
                'sasl.password': API_SECRET_KEY
                }
    return sasl_conf



def schema_config():
    return {'url':ENDPOINT_SCHEMA_URL,

    'basic.auth.user.info':f"{SCHEMA_REGISTRY_API_KEY}:{SCHEMA_REGISTRY_API_SE
CRET}"

    }


class Car:
    def __init__(self,record:dict):
        for k,v in record.items():
            setattr(self,k,v)

        self.record=record

    @staticmethod
    def dict_to_car(data:dict,ctx):
        return Car(record=data)

    def __str__(self):
        return f"{self.record}"


def main(topic):

    schema_str = """
    {
  "$id": "http://example.com/myURI.schema.json",
  "$schema": "http://json-schema.org/draft-07/schema#",
  "additionalProperties": false,
  "description": "Sample schema to help you get started.",
  "properties": {
    "brand": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "car_name": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "engine": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "fuel_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "km_driven": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "max_power": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "mileage": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "model": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "seats": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "seller_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "selling_price": {
      "description": "The type(v) type is used.",
      "type": "number"
    },
    "transmission_type": {
      "description": "The type(v) type is used.",
      "type": "string"
    },
    "vehicle_age": {
      "description": "The type(v) type is used.",
      "type": "number"
    }
  },
  "title": "SampleRecord",
  "type": "object"
}
    """
    json_deserializer = JSONDeserializer(schema_str,
                                         from_dict=Car.dict_to_car)

    consumer_conf = sasl_conf()
    consumer_conf.update({
                     'group.id': 'group1',
                     'auto.offset.reset': "latest"})

    consumer = Consumer(consumer_conf)
    consumer.subscribe([topic])


    while True:
        try:
            # SIGINT can't be handled when polling, limit timeout to 1 second.
            msg = consumer.poll(1.0)
            if msg is None:
                continue

            car = json_deserializer(msg.value(),
SerializationContext(msg.topic(), MessageField.VALUE))

            if car is not None:
                print("User record {}: car: {}\n"
                      .format(msg.key(), car))
        except KeyboardInterrupt:
            break

    consumer.close()

main("test_topic")
```

Code explanation:

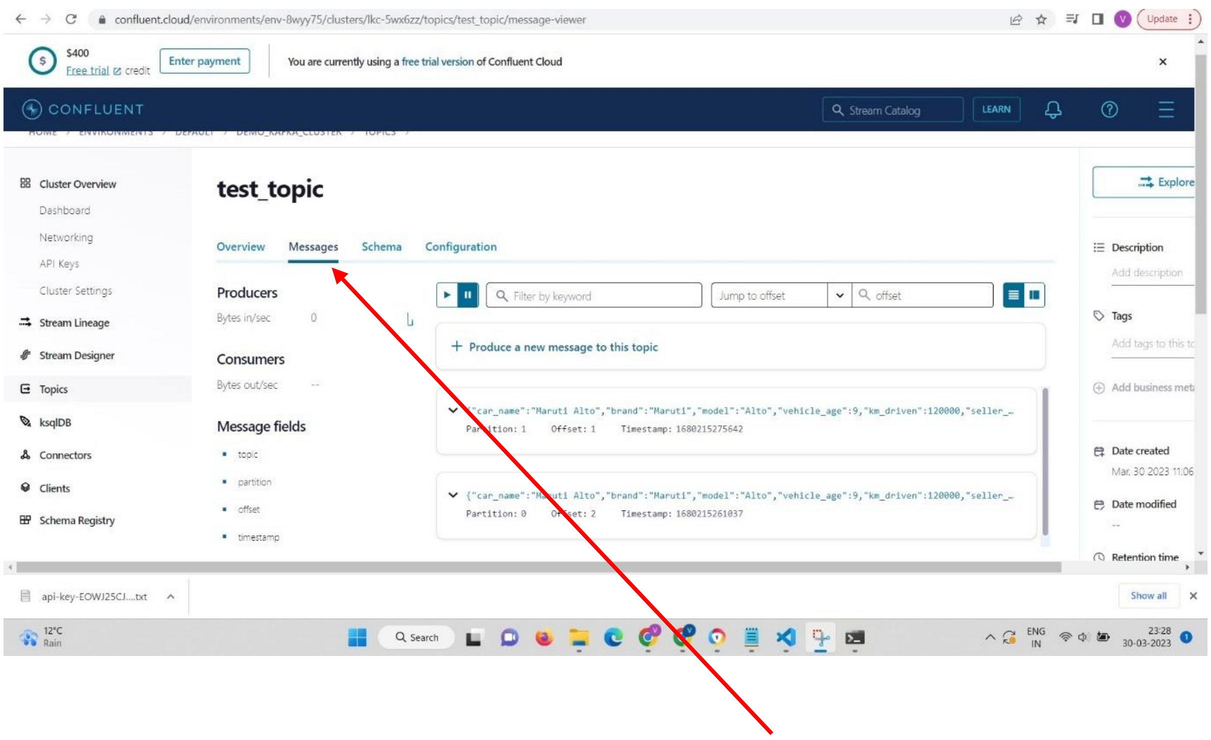
This code defines a Kafka consumer that reads messages from a Kafka topic named "test_topic" and deserializes them using a JSON Deserializer. The JSON Deserializer is created using a JSON schema string that defines the schema of the message payload. The JSON schema defines the properties of a Car object, such as brand, car name, engine, fuel type, km driven, max power, mileage, model, seats, seller type, selling price, transmission type, and vehicle age. The deserialized Car object is then printed to the console. The Kafka consumer is configured with security settings and subscribes to the specified topic. The consumer will keep running until interrupted by the user. When a message is received, it is deserialized and the Car object is printed to the console.

Run following code on terminal for producer side

python "your path for the producer code"

Run following code on terminal for consumer side

python "your path for the consumer code"



test_topic

Producers
Bytes in/sec 0

Consumers
Bytes out/sec --

Message fields
- topic
- partition
- offset
- timestamp

+ Produce a new message to this topic

```
{"car_name":"Maruti Alto","brand":"Maruti","model":"Alto","vehicle_age":9,"km_driven":120000,"seller_…
Partition: 1     Offset: 1     Timestamp: 1680215275642

{"car_name":"Maruti Alto","brand":"Maruti","model":"Alto","vehicle_age":9,"km_driven":120000,"seller_…
Partition: 0     Offset: 2     Timestamp: 1680215261037
```

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After running both the codes in the terminal clicke on the messages.