Aiven for Apache Kafka, InfluxDB & Grafana

In this tutorial, we are going to see an introduction to services provided by Aiven like Apache kafka, InfluxDB and Grafana.

We will use a COVID testing simulator which produces streaming data in python to publish a message in kafka and

We are going to create three services:

- Aiven for Apache kafka
- Aiven for InfluxDB
- Aiven for Grafana

1. Aiven for Apache kafka

Create a new service

Service: Apache Kafka, Service Name: kafka-covid-test-stream

For details on creating a kafka service in aiven console please follow this documentation

https://docs.aiven.io/docs/products/kafka/getting-started.html

Click on the service name [kafka-covid-test-stream]

The overview page of the service opens which shows status, connection parameters and configuration option

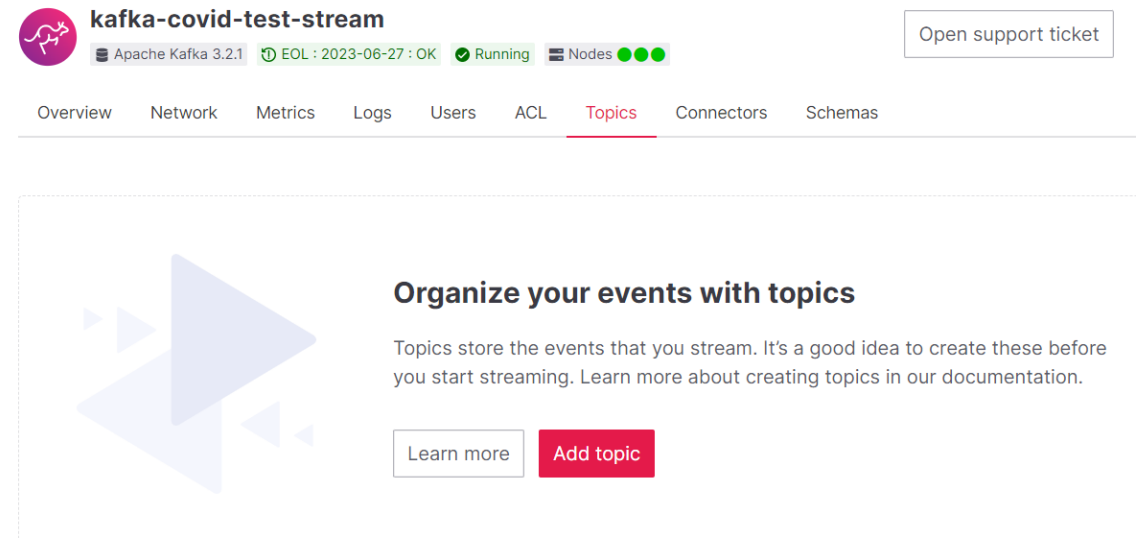
Copy ***Service URI***

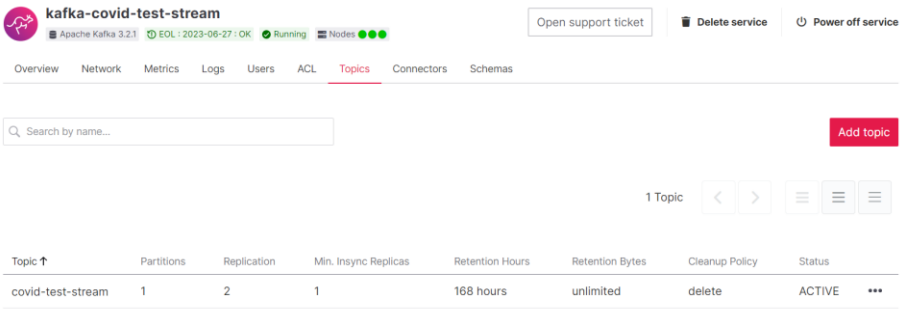
Download the following connection parameters:

- ***Access Key*** *: service-name --> Overview Connection information --> service.key*
- ***Access Certificate*** *: service-name --> Overview Connection information --> service.cert*
- ***CA Certificate*** *: service-name --> Overview Connection information --> ca.pem*

Enable Apache kafka for REST API:

Go to Topics, click on 'Add Topic' --> 'covid-test-stream'





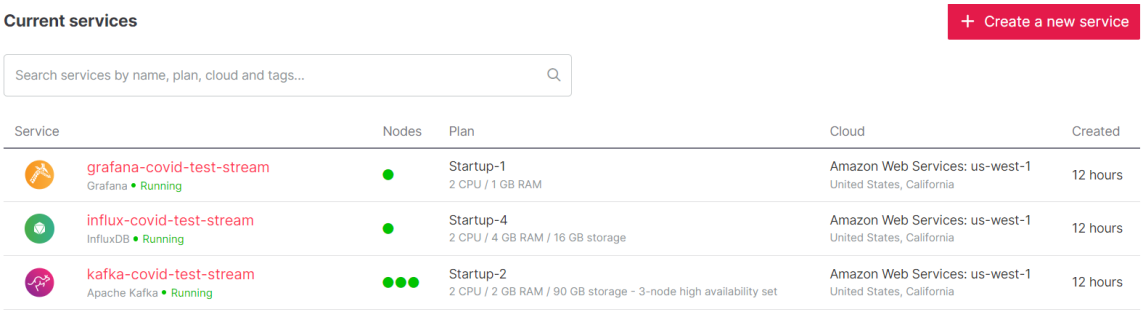
2. **Aiven for InfluxDB**

   Create Service: InfluxDB, Service Name: influx-covid-test-stream

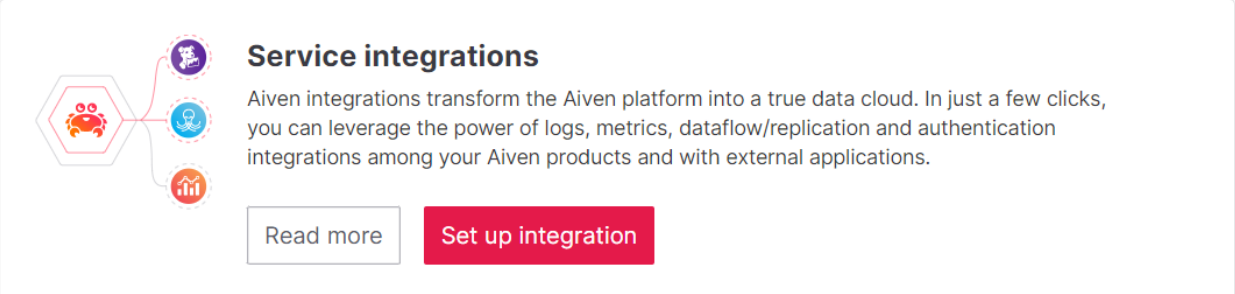
3. **Aiven for Grafana**

   Create Service: Grafana, Service Name: grafana-covid-test-stream

Once all the services are running, we will integrate with Grafana and Kafka services.

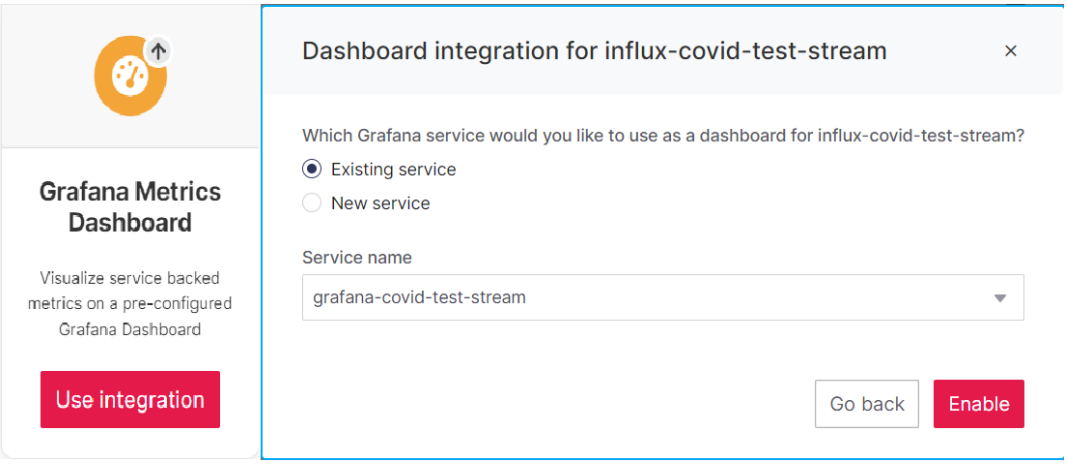


Right now, there are no integrations present

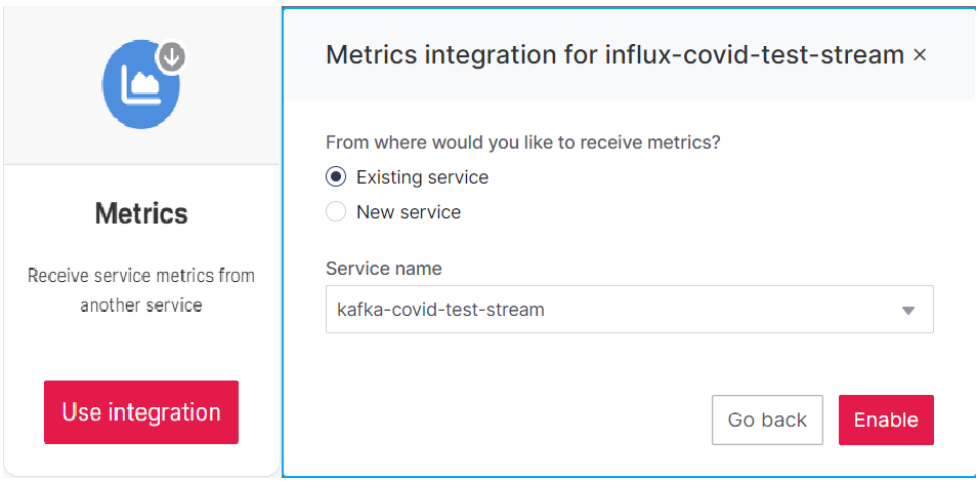


open InfluxDB service Overview page --> Service Integrations section --> Set up integration

- Grafana service



- Kafka service



To know details about service integration, [refer this document]

Now we are ready for out COVID testing data simulator as a kafka-producer. We are going to simulate COVID testing done at a pharmacy with the help of Faker library in python. Each object has information about a person and the COVID test result along with UUID and timestamp in JSON format. For example,

```
covid_data = {
      "Name" : get_name(gender),
      "Gender" : gender,
      "Date of Birth" : str(fake.date_of_birth(maximum_age=90)),
      "Address" : fake.address(),
      "Email Id" : fake.email(),
      "Phone" : fake.numerify('##########'),
      "Test result" : get_test_result(),
      "Timestamp" : datetime.now().isoformat()
   }
```

You will need to install python3 on your machine.

```
git clone https://github.com/kvartak2/Aiven-SA-Homework

pip install -r requirements.txt
```

In the 'covid_test_producer.py', replace

- ***SERVICE_URI*** with service URI which we copied in step 1

Save and run the program

```
python covid_test_producer.py
```

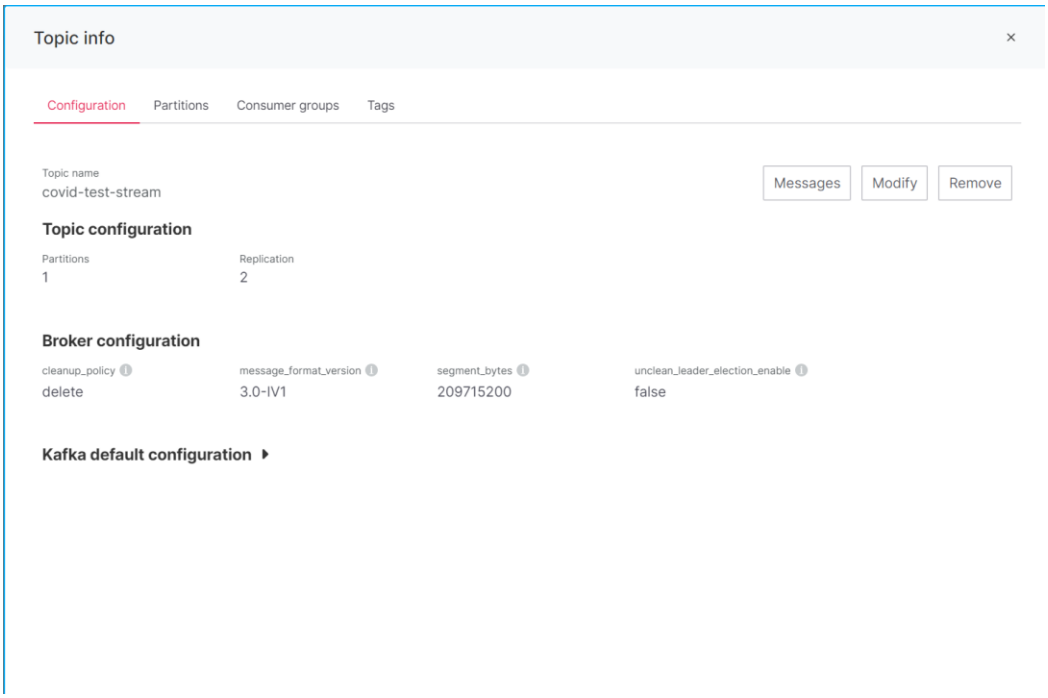
You will see the stream data as following and these messages will be sent continuously to kafka until we enter CTRL+C.

PROBLEMS OUTPUT TERMINAL JUPYTER DEBUG CONSOLE

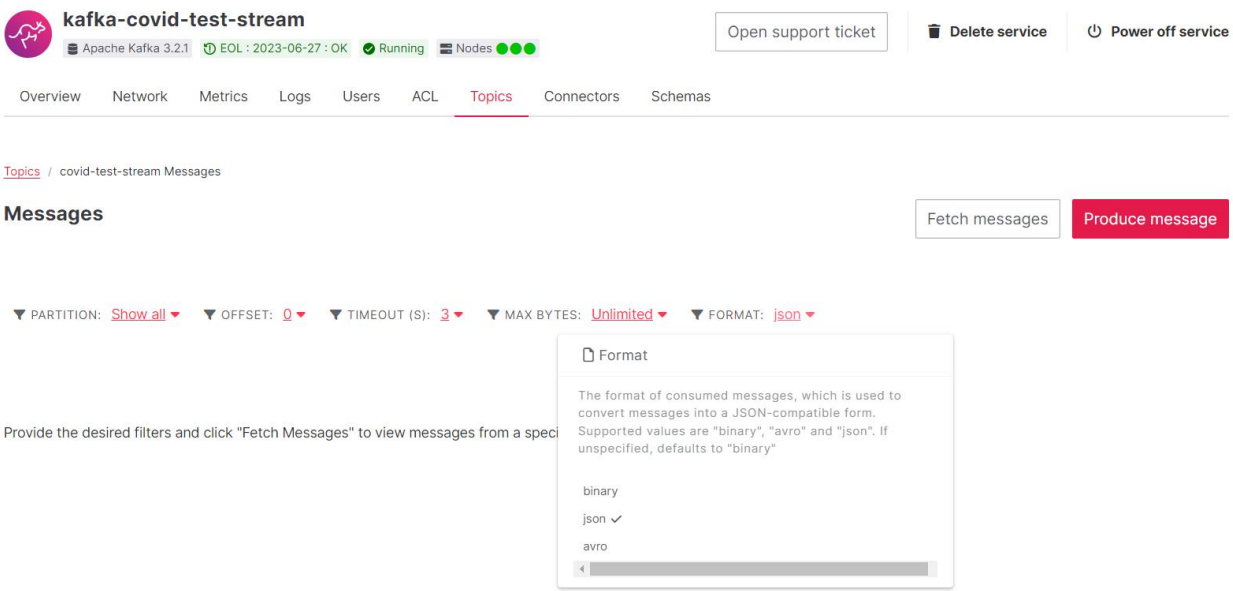

```
{
    "id": "7d7cd4d1-47e7-4ff0-99bf-a01fb8d4edcf"
},{
    "Name": "Peter Monroe",
    "Gender": "M",
    "Date of Birth": "1932-05-28",
    "Address": "8440 Cooper Wells Apt. 683\nNorth Emily, CT 75636",
    "Email Id": "ismith@example.org",
    "Phone": "6355218783",
    "Test result": "Positive",
    "Timestamp": "2022-10-05T14:15:05.907080"
}
{
    "id": "12d95cbf-e3fe-4f13-bd5a-cb81dc19a21a"
},{
    "Name": "Christy Flores",
    "Gender": "F",
    "Date of Birth": "1981-11-13",
    "Address": "USS Lopez\nFPO AE 51618",
    "Email Id": "nicole99@example.com",
    "Phone": "9909218665",
    "Test result": "Negative",
    "Timestamp": "2022-10-05T14:15:06.303597"
}
```

Now let’s verify if we can see the messages in kafka service

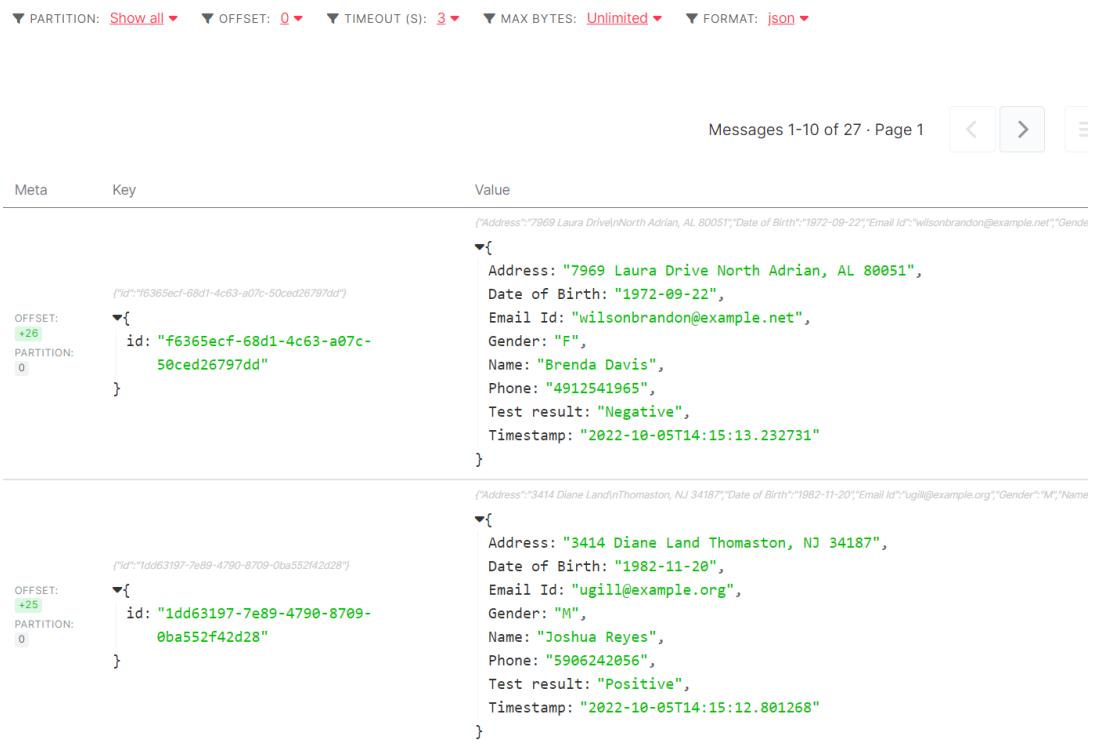
Go to ‘kafka-covid-test-stream’ service --> ***Topics*** (select Topic ‘covid-test-stream’) --> ***Messages***



Change ***Format*** to ***JSON*** and click on ***Fetch Messages***



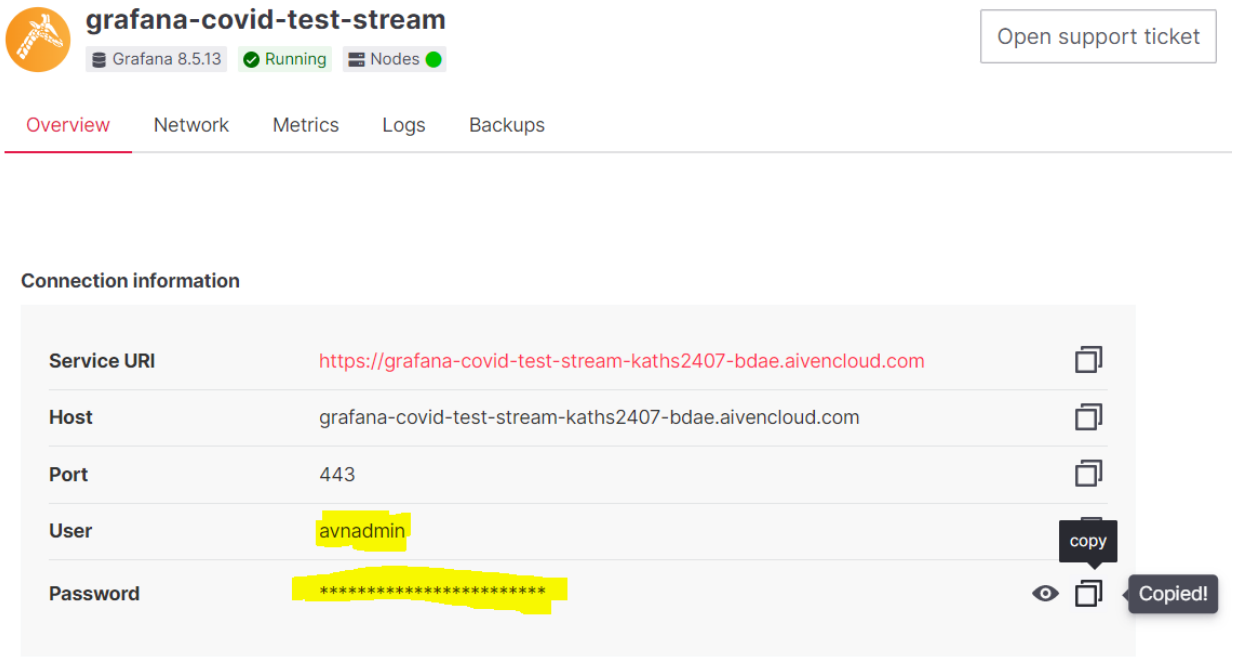
You can see that messages have been received in kafka service in a topic.



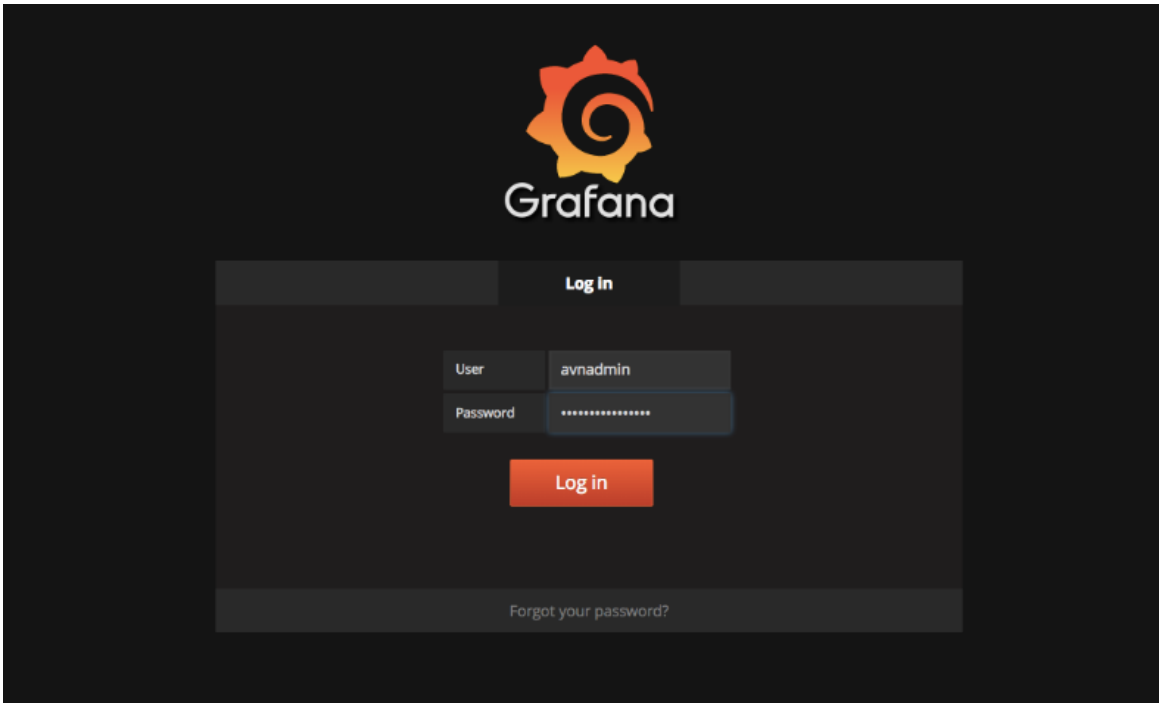
Now, lets open Grafana dashboard and see the data flowing from Kafka --> InfluxDB --> Grafana

Go to Grafana service --> Overview --> connection information

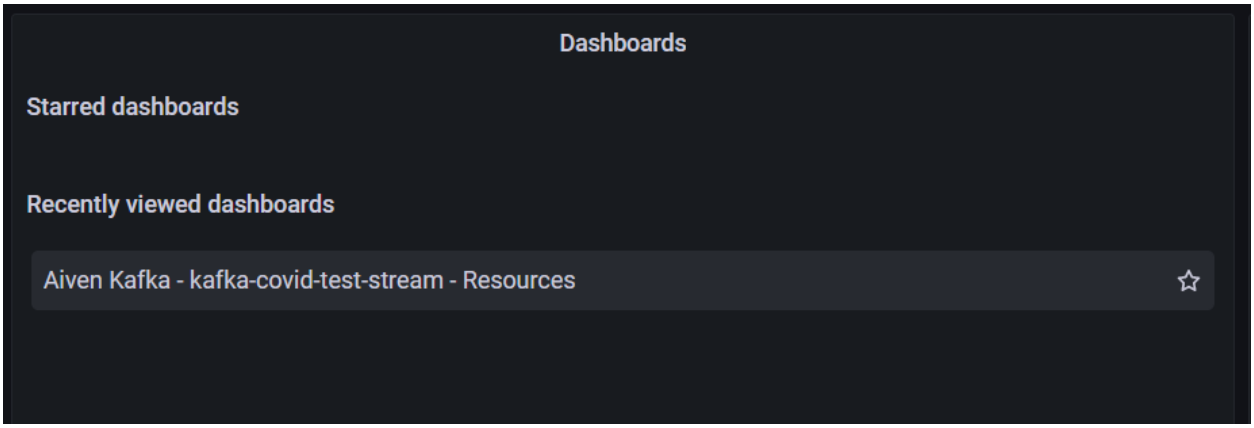
Copy username and password to login to Grafana dashboard



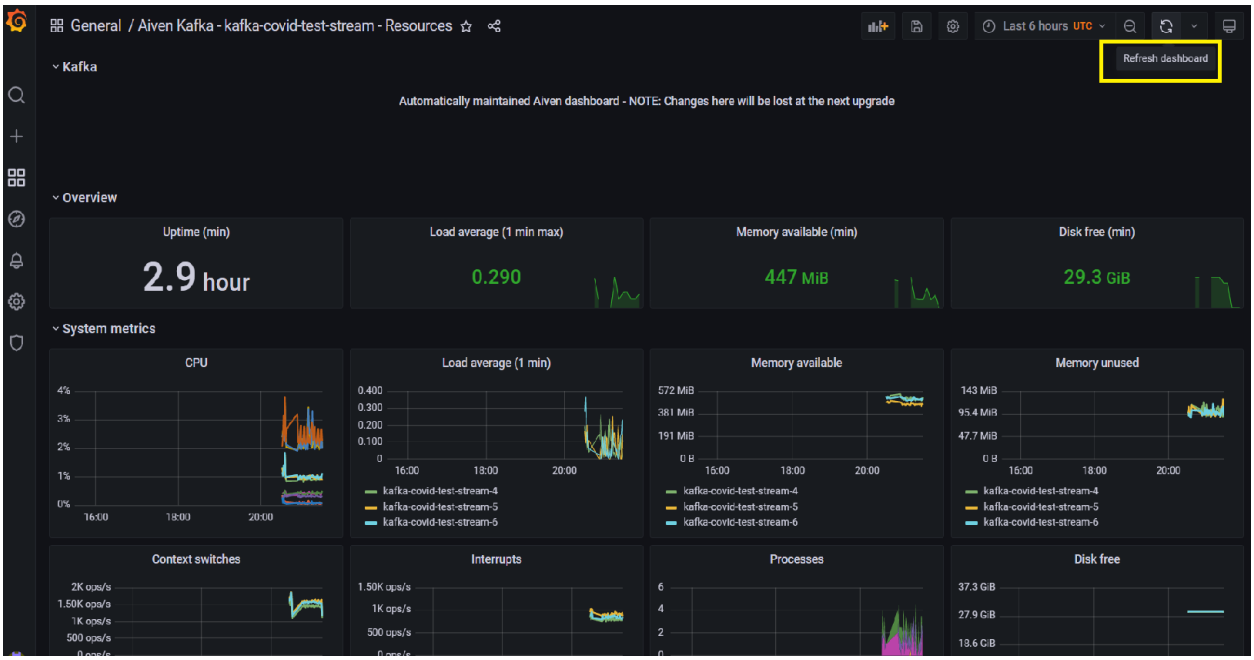
Click on Service URI and login to Grafana dashboard with username(avnadmin) and password saved in the previous step



The Grafana default view opens with one default dashboard



Click on **'Aiven Kafka - kafka-covid-test-stream – Resources'** to see the kafka metrics which is maintained by Avion with refresh button on top right corner.



We can create a custom dashboard from scratch in Grafana as well.

Additionally, we can connect to InfluxDB via command or with the help of a program. [To know more about this refer this documentation.]

References:

https://help.aiven.io/en/articles/1456441-getting-started-with-service-integrations

https://docs.aiven.io/docs/products/kafka/howto/connect-with-python.html