

CLOUDERA

Streaming Demo



Streaming data: The Story

Any kind of data is produced as a stream of events.

Credit card transactions, sensor measurements, machine logs, or user interactions on a website or mobile application, all of these data are generated as a stream.

In our use case

OBD2 data logging - use case examples

OBD2 data from cars and light trucks can be used in various use cases:



Logging data from cars

OBD2 data from cars can e.g. be used to reduce fuel costs, improve driving, test prototype parts and insurance

[Learn more →](#)



Real-time car diagnostics

OBD2 interfaces can be used to stream human-readable OBD2 data in real-time, e.g. for diagnosing vehicle issues

[Learn more →](#)



Predictive maintenance

Cars and light trucks can be monitored via IoT OBD2 loggers in the cloud to predict and avoid breakdowns

[Learn more →](#)



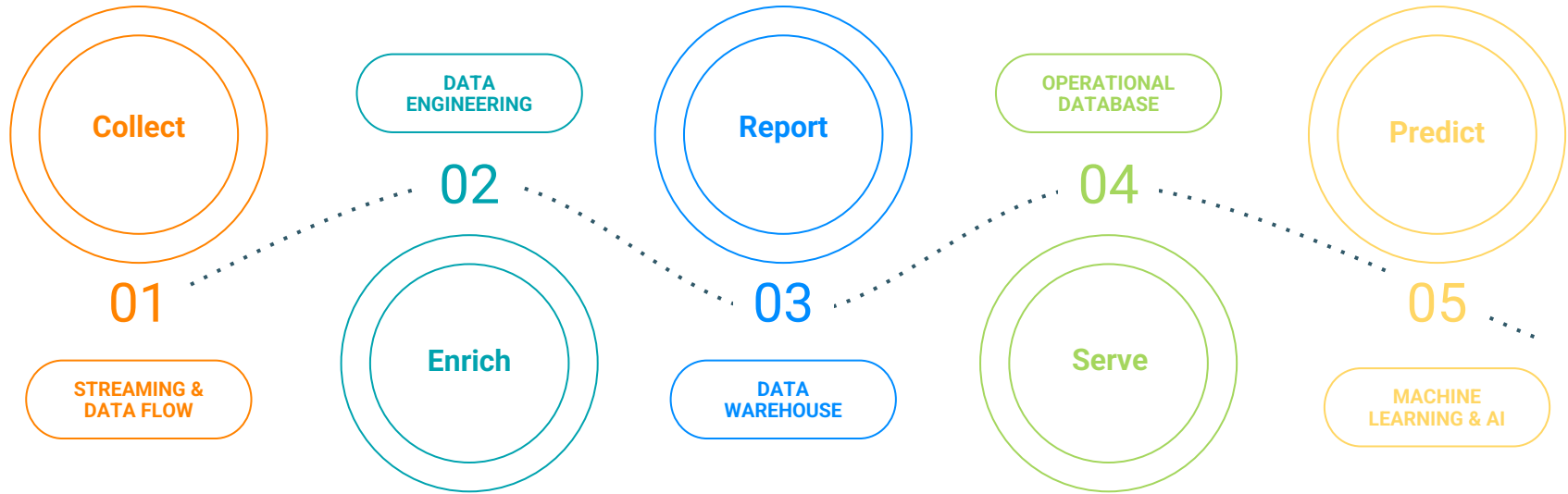
Vehicle blackbox logger

An OBD2 logger can serve as a 'blackbox' for vehicles or equipment, providing data for e.g. disputes or diagnostics

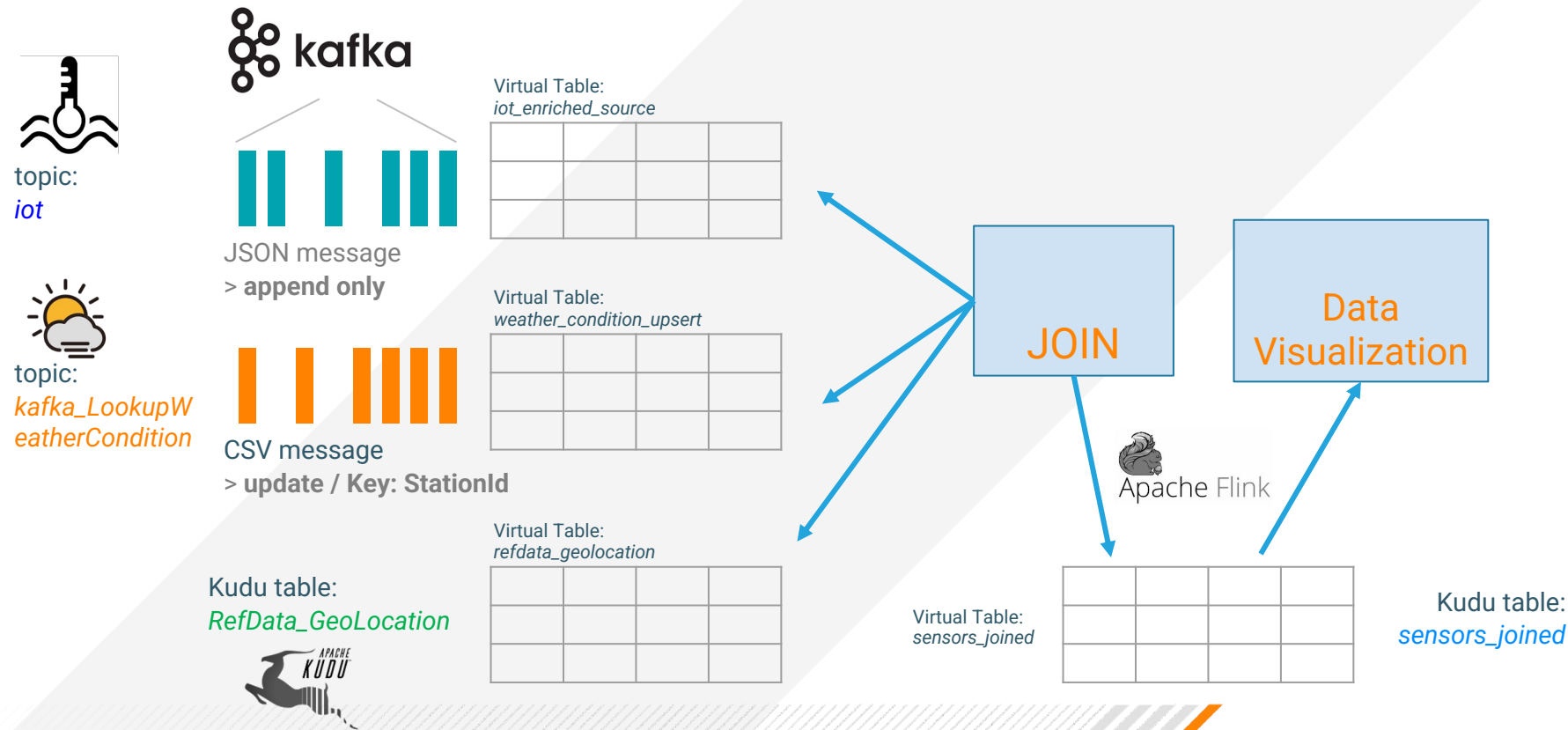
[Learn more →](#)

Streaming Data Scenario: Zero Downtime

IoT for predictive maintenance



DEMO FLOW



Collection Phase

Collect data from the edge



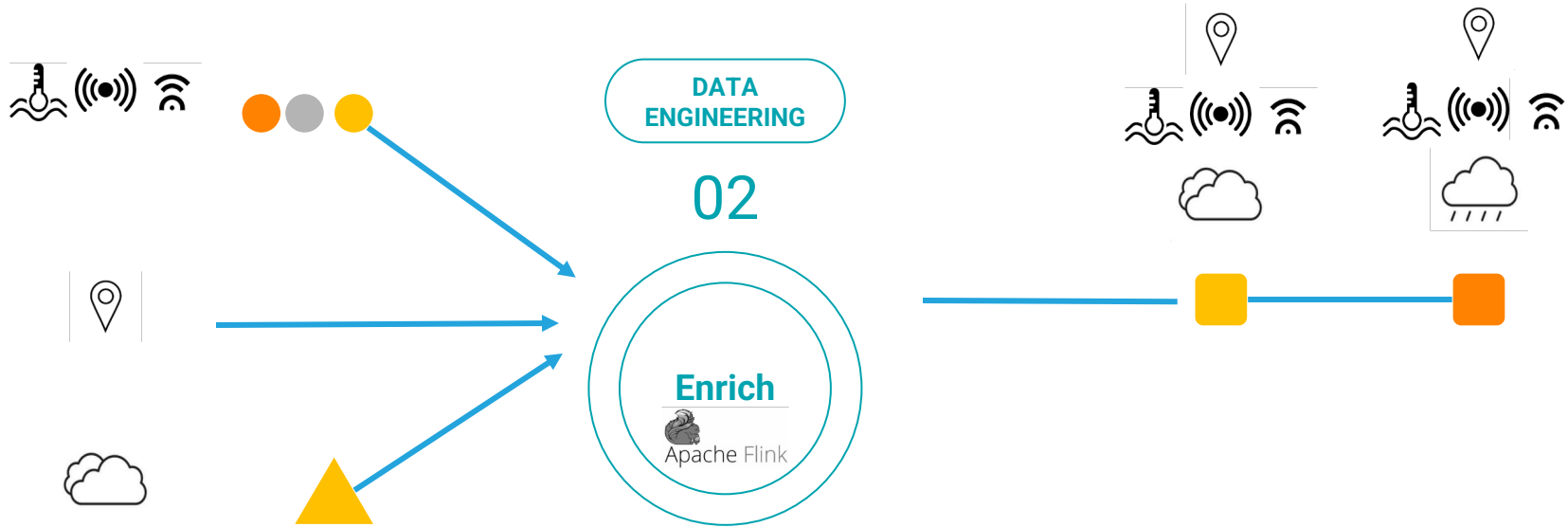
```
centos@pdp-jpgf1clouders@parcels:~/link/txsamples/streaming$ cat /dev/null > /dev/null &
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4674 : 133,164983885796,18,7,0,8,385,78,6,14,9,235,4,3,9,7,957,4,1012,5,1014,1,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4675 : 134,164983885796,.....230,9,7,15,8,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4676 : 135,164983885796,.....5,834,.....176,7,9,15,1,17,4,83,9,14,7
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4677 : 136,164983885796,17,5,0,0,191,83,3,16,6,289,6,9,4,924,6,1014,6,1490,5,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4678 : 137,164983885796,17,5,0,9,111,61,8,9,8,46,4,9,12,6,859,7,1015,9,1483,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4679 : 138,164983885796,22,6,0,9,243,7,3,17,6,254,5,9,971,7,1011,7,1013,4,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4680 : 139,164983885796,.....260,15,5,15,9,60,3,.....1013,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4681 : 140,164983885796,5,4,0,4,217,2,0,9,4,201,16,9,21,7,732,8,1020,2,1085,4,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4682 : 141,164983885796,17,5,0,0,240,87,15,4,287,16,2,2,6,5,947,8,1012,8,1014,6,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4683 : 142,164983885796,2,1,.....3,143,86,9,1,8,137,14,18,699,2,1022,5,1088,6,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4684 : 143,164983885796,.....6,357,.....237,15,1,20,7,14,4,95,13,6
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4685 : 144,164983885796,14,5,0,8,187,75,9,10,3,262,3,6,1,864,4,1016,5,1489,2,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4686 : 145,164983885796,20,5,0,6,247,72,6,15,4,112,5,8,9,959,4,1011,4,1013,3,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4687 : 146,164983885796,12,9,0,8,217,87,6,18,9,357,9,12,2,841,8,1017,2,1487,7,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4688 : 147,164983885796,14,5,0,.....88,9,12,7,48,2,5,4,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4689 : 148,164983885796,18,0,4,0,169,84,8,15,4,136,5,6,11,2,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4690 : 149,164983885796,17,0,9,250,48,4,1,3,236,1,9,4,1,891,5,1015,8,1493,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4691 : 150,164983885796,15,5,8,.....86,5,13,4,221,8,1,15,3,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4692 : 151,164983885796,6,0,301,76,4,1,1,9,50,5,4,6,839,4,1014,1,1489,2,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4693 : 152,164983885796,6,4,0,0,109,6,9,1,3,248,5,8,22,6,736,9,1021,4,1092,1,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4694 : 153,164983885796,15,9,0,2,400,.....6,15,2,4,9,7,3,963,8,1022,1,1013,7,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4695 : 154,164983885796,19,9,0,8,135,72,9,16,5,270,4,7,7,9,946,6,1011,8,1013,7,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4696 : 155,164983885796,20,6,0,0,463,74,4,15,.....973,6,1012,1013,3,.....193,15,2,7,10,3,76,5,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4697 : 156,164983885796,11,5,0,8,139,72,8,7,53,2,11,9,834,7,1017,4,1486,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4698 : 157,164983885796,20,1,0,8,365,74,9,15,5,281,9,16,4,961,1011,6,1013,3,.....
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4699 : 158,164983885796,18,9,0,8,243,78,15,382,3,8,7,9,944,4,1011,5,1013,0,.....17,1,45,14,4
00:31:07.980 INFO producer.KafkaLookupWeatherCondition - Published kafka_lookupWeatherCondition/0/58
4700 : 159,164983885796,19,9,0,0,246,75,6,15,5,288,7,2,11,9,963,1011,7,1013,3,.....
```

Kafka Inputs

```
- Published iot/8/8469 :  
{ "sensor_ts":1649831184077,"truck_id":12,"sensor_0  
":351,"sensor_1":5,"sensor_2":14,"sensor_3":12,"se  
nsor_4":22,"sensor_5":17,"sensor_6":61,"sensor_7":  
66,"sensor_8":78,"sensor_9":17,"sensor_10":308,"se  
nsor_11":708}  
  
- Published kafka_LookupWeatherCondition/12/5843963  
:  
109,1649830857196,15.7,0,0,318,94.5,14.8,176,3.2,6.1  
,919.4,,1015.3,1490.8,,,,,,,,
```

```
centos@cdp:/opt/cloudera/parcels/FLINK/lib/flink/examples/streaming 1
.../opt/cloudera/parcels/FLINK/lib/flink/examples/streaming (ssh) 31 centos@cdp:~ (ssh) 32
06:31:07,900 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4674 : 133,1649830857196,18.7,0,0,305,78.6,14.9,235,4.3,9.7,957.4,1012.5,1014.1,,,,,
06:31:07,900 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4675 : 134,1649830857196,,,,,238,9.7,15.8,,,,,
06:31:07,901 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4676 : 135,1649830857196,,,5,814,,,,,176,7.9,15.1,17.4,83.9,14.7
06:31:07,901 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4677 : 136,1649830857196,17.5,0,0,191,83.3,14.6,289,4.9,4,924.6,,,1014.6,1490.5,,,,,
06:31:07,902 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4678 : 137,1649830857196,17.2,0,0,311,61.8,9.8,46,6.8,12.6,859.7,,1015.9,1483.9,,,,,
06:31:07,902 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4679 : 138,1649830857196,22.6,0,0,263,73.3,17.6,214,5.9,971.7,1011.7,1013.4,,,,,
06:31:07,903 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4680 : 139,1649830857196,,,,,260,11.9,15.8,966.2,,1013.1,,,,,
06:31:07,904 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4681 : 140,1649830857196,5.4,0,0,177,100.5,4,261,16.9,27.7,752.8,,1020.2,3085.4,,,,,
06:31:07,904 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4682 : 141,1649830857196,17.6,0,0,248,87,15.4,107,3.2,6.5,947.8,1012.8,1014.6,,,,,
06:31:07,905 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4683 : 142,1649830857196,2.2,0,343,96.9,1.8,177,14,18,699.2,,,1022.5,3088.6,,,,,
06:31:07,905 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4684 : 143,1649830857196,,,0,357,,,,,237,15.1,20.2,14.4,95,13.6
06:31:07,906 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4685 : 144,1649830857196,14.5,0,0,187,75.9,10.3,262,3.6,6.1,864.4,,1016.5,1489.2,,,,,
06:31:07,907 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4686 : 145,1649830857196,20.5,0,0,347,72.6,15.4,312,5.8,9,959.4,1011.4,1013.3,,,,,
06:31:07,907 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4687 : 146,1649830857196,12.9,0,0,217,87.6,10.9,357,9,12.2,841.8,,1017.2,1487.7,,,,,
06:31:07,908 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4688 : 147,1649830857196,14.5,0,,,88.9,12.7,48,2.5,4,,,,,
06:31:07,908 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4689 : 148,1649830857196,18.0,0,0,168,84.8,15.4,136,5.4,11.2,,,,,
06:31:07,909 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4690 : 149,1649830857196,17.0,0,206,68.4,11.1,236,1.8,6.1,891.3,,1015.8,1493,,,,,
06:31:07,909 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4691 : 150,1649830857196,15.8,0,,,86.5,13.6,212,8.3,13.3
06:31:07,910 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4692 : 151,1649830857196,18.0,0,0,363,76.9,13.9,91,5.4,9.4,939.4,,1014.1,1489.2,,,,,
06:31:07,911 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4693 : 152,1649830857196,5.4,0,0,109,97.6,5.1,148,5.8,12.6,736.9,,1021.4,3092.1,,,,,
06:31:07,911 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4694 : 153,1649830857196,19.9,0,0,2,616,76.5,15.6,236,9,17.3,963.8,1012.1,1013.7,,,,,
06:31:07,912 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4695 : 154,1649830857196,19.9,0,0,335,72.9,14.9,270,4.7,7.9,956.6,1011.8,1013.7,,,,,
06:31:07,912 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4696 : 155,1649830857196,20.0,0,0,483,74.4,15.9,,,973.6,1012,1013.3,,,193,15.1,22.7,19.3,76.5,
06:31:07,913 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4697 : 156,1649830857196,13.5,0,0,339,72.8,8.7,53,7.2,11.9,834.7,,1017.4,1486.4,,,,,
06:31:07,913 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4698 : 157,1649830857196,20.1,0,0,365,74.9,15.5,283,9.4,16.6,961,1011.6,1013.3,,,,,
06:31:07,914 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4699 : 158,1649830857196,18.9,0,0,343,78,15,302,3.6,7.9,948.4,1011.5,1013.6,,,,,17.1,85,14.6
06:31:07,915 INFO producer.KafkaLookupWeatherCondition - Published kafka_LookupWeatherCondition/0/587
4700 : 159,1649830857196,19.9,0,0,346,75.6,15.5,280,7.2,11.9,963,1011.7,1013.3,,,,,
[]
```

Enrich the data



Streaming SQL Console

- Console
- Data Providers
- Connectors
- Materialized Views
- API Explorer
- Flink Dashboard

admin

Console - Run SQL against streams of data and create persistent SQL streaming jobs

Compose Tables Functions History **SQL Jobs**

Search by name

Running Jobs

ID	Name	User	Start Time	Link	State	Actions
5196	jovial_snyder	admin	2022-04-14 07:16:31 (5 days ago)	Flink Dashboard	RUNNING	<div>Stop</div>

Previous

1

Next

Details [Log](#)

[Edit Selected Job](#)

Property	Value
----------	-------

Job Name	jovial_snyder
----------	---------------

Sinks	`kudu_source`.`default_database`.`default.sensors_joined`
-------	---

SQL	INSERT INTO `kudu_source`.`default_database`.`default.sensors_joined` SELECT iot.`sensor_id`, iot.`sensor_ts`, iot.`sensor_0` as pressure, iot.`sensor_1` as torsion, weather.`tre200s0` as AirTemperature2m, geo.`city`, geo.`lat`, geo.`lon` FROM iot_enriched_source AS iot JOIN weather_condition_upsert AS weather ON iot.`sensor_id` = weather.`stationid` LEFT JOIN `kudu_source`.`default_database`.`default.refdata_geolocation` AS geo ON iot.`sensor_id` = geo.`sensor_id`;
-----	--

Parallelism	1 thread(s)
-------------	-------------

Sample Behavior	Sample one message every second
-----------------	---------------------------------

Flink

Global Dashboard

Overview

Jobs

Running Jobs

Completed Jobs

Version: 1.14.0-csa1.6.1.0

Commit: 3df26ce @ 2022-01-17T13:15:31+01:00

Message: 0

Available Task Slots

4

Total Task Slots 5 | Task Managers 1

Running Jobs

1

Finished 0 | Canceled 0 | Failed 0

Running Job List

Job Name	Start Time	Duration	End Time	Tasks	Status	Cluster
jovial_snyder	2022-04-14 08:17:05	5d 7h 24m 34s	-	6 1	RUNNING	application_1649882930287_0003

Completed Job List

Job Name	Start Time	Duration	End Time	Tasks	Status	Cluster
Streaming WordCount	2022-04-13 16:21:59	12s	2022-04-13 16:22:11	5 5	FINISHED	

cdo-63.35.128.84 nip.io:8078/#/

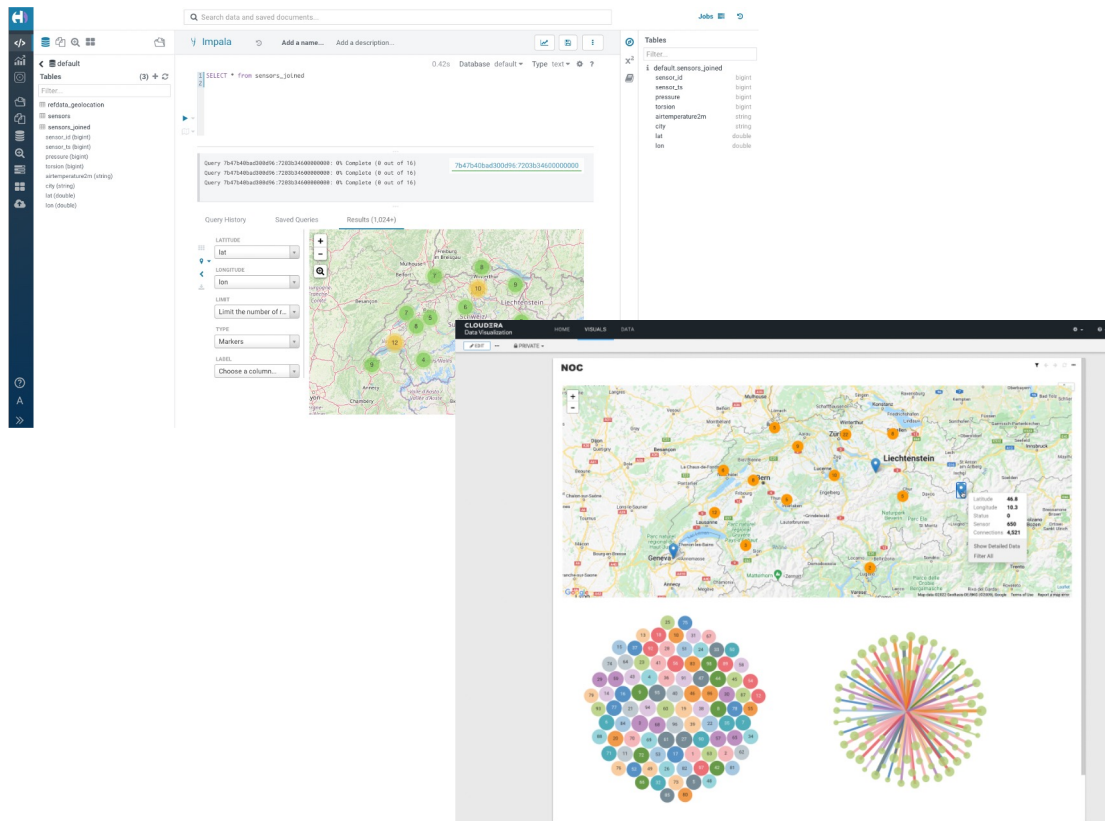
[Link](#)

Report



03

DATA
WAREHOUSE



Impala + Kudu

The screenshot displays the Cloudera Impala web interface. On the left, a sidebar shows the 'Tables' section with a list of tables including 'default', 'refdata_geolocation', 'sensors', and 'sensors_joined'. The main area shows a query execution plan for the query 'SELECT * from sensors_joined'. The query is executed in 0.42s. Below the query, a map visualization shows the results of the query, with markers indicating the location of sensors. The map is centered on the region around Belfort, France, and shows various cities and regions. The map is labeled with 'Results (1,024+)'. On the right, a 'Tables' section lists the columns and data types for the 'default.sensors_joined' table.

Search data and saved documents...

Impala Add a name... Add a description...

0.42s Database default Type text ?

```
1 SELECT * from sensors_joined
2
```

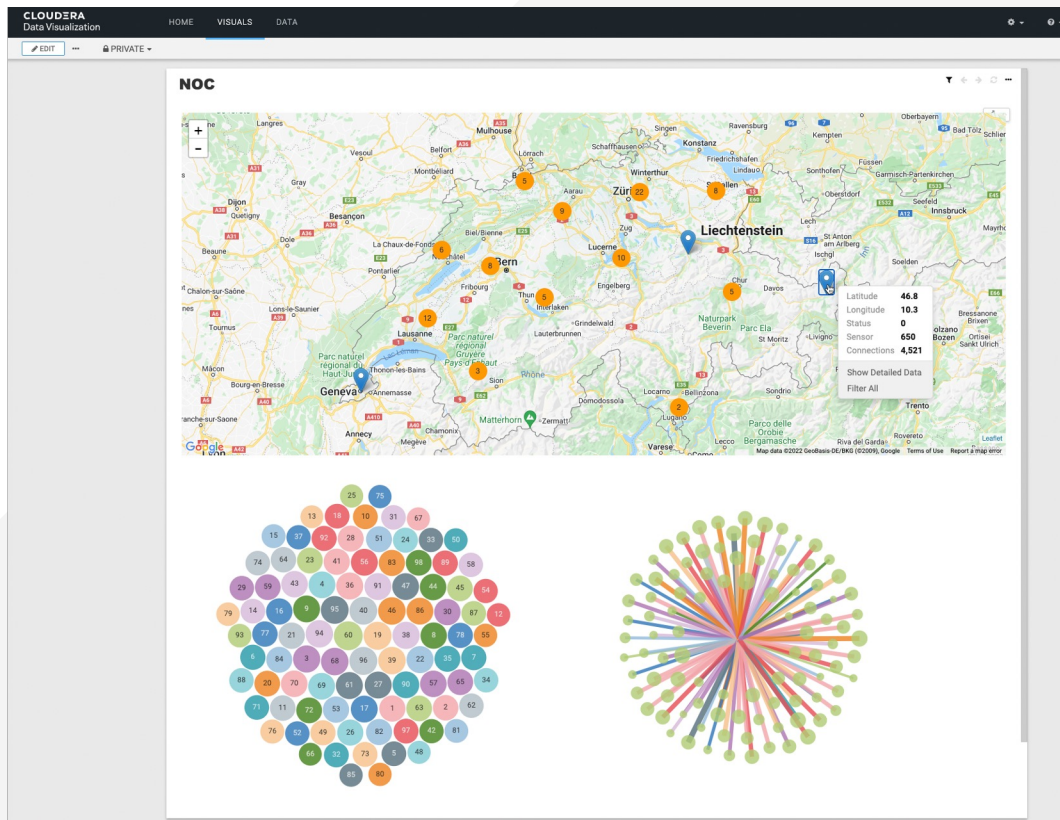
Query 7b47b48bad308d96:7283b3460808080808: 0% Complete (8 out of 16)
Query 7b47b48bad308d96:7283b3460808080808: 0% Complete (8 out of 16)
Query 7b47b48bad308d96:7283b3460808080808: 0% Complete (8 out of 16)

Query History Saved Queries Results (1,024+)

LATITUDE lat
LONGITUDE lon
LIMIT Limit the number of r...
TYPE Markers
LABEL Choose a column...

Tables
Filter...
default.sensors_joined
sensor_id bigint
sensor_ts bigint
pressure bigint
torsion bigint
airtemperature2m string
city string
lat double
lon double

Data Visualization and Beyond



[Link](#)

SQL Stream Builder

Continuous SQL allows for processing data using simple grammar.

