REAL-TIME STREAMING: JABODETABEK OPEN WEATHER

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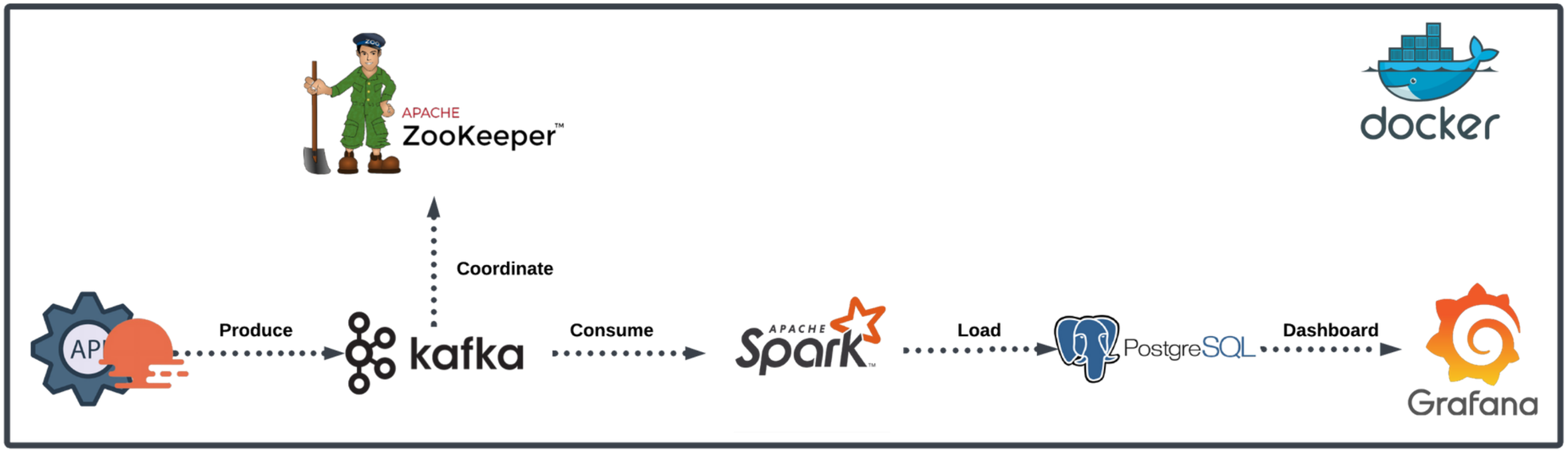
LATAR BELAKANG

Dalam era digital ini, pemahaman terhadap kondisi cuaca aktual sangat penting untuk berbagai aspek kehidupan sehari-hari dan bisnis. Proyek ini bertujuan untuk menciptakan sistem real-time streaming yang memanfaatkan data cuaca dari OpenWeather untuk daerah Jabodetabek. Dengan menyediakan informasi cuaca yang akurat dan terkini, proyek ini dapat memberikan manfaat signifikan bagi masyarakat, bisnis, dan sektor lainnya di wilayah Jabodetabek. Dengan pemantauan cuaca secara real-time, pengguna dapat mengambil keputusan yang lebih tepat, seperti perencanaan perjalanan, manajemen risiko, dan penyesuaian kegiatan berbasis cuaca

APA ITU OPEN WEATHER API?

Layanan berbasis web yang menyediakan informasi cuaca dan prakiraan cuaca global secara real-time. Dengan mengakses OpenWeatherMap API, pengguna dapat memperoleh data cuaca seperti suhu, kelembaban, kecepatan angin, dan prakiraan cuaca untuk lokasi tertentu. API ini mendukung berbagai jenis permintaan, termasuk permintaan cuaca saat ini, prakiraan jangka pendek, dan prakiraan jangka panjang.

PIPELINE


APACHE
ZooKeeper™
docker
Coordinate
API
Produce
kafka
Consume
APACHE
Spark
Load
PostgreSQL
Dashboard
Grafana

SOURCE

```
{'country': 'ID', 'city_name': 'Bogor', 'temperature': 81, 'temp_min': 76, 'temp_max': 81, 'feel_like': 86, 'humidity': 82, 'wind_s
peed': 2, 'temp_diff': 6, 'creation_time': '2024-02-04T00:33:05.308704'}
wait for 10 seconds
{'country': 'ID', 'city_name': 'Depok', 'temperature': 81, 'temp_min': 77, 'temp_max': 83, 'feel_like': 86, 'humidity': 83, 'wind_s
peed': 5, 'temp_diff': 3, 'creation_time': '2024-02-04T00:33:10.429713'}
wait for 10 seconds
{'country': 'ID', 'city_name': 'Tangerang', 'temperature': 80, 'temp_min': 78, 'temp_max': 84, 'feel_like': 80, 'humidity': 93, 'wi
nd_speed': 6, 'temp_diff': -4, 'creation_time': '2024-02-04T00:33:15.527343'}
wait for 10 seconds
{'country': 'ID', 'city_name': 'Bekasi', 'temperature': 80, 'temp_min': 78, 'temp_max': 83, 'feel_like': 80, 'humidity': 89, 'wind_
speed': 5, 'temp_diff': -4, 'creation_time': '2024-02-04T00:33:20.617116'}
wait for 10 seconds
{'country': 'ID', 'city_name': 'Jakarta', 'temperature': 80, 'temp_min': 78, 'temp_max': 84, 'feel_like': 80, 'humidity': 83, 'wind
_speed': 5, 'temp_diff': -4, 'creation_time': '2024-02-04T00:33:25.711758'}
```

WILAYAH JADBODETABEK

TABLE

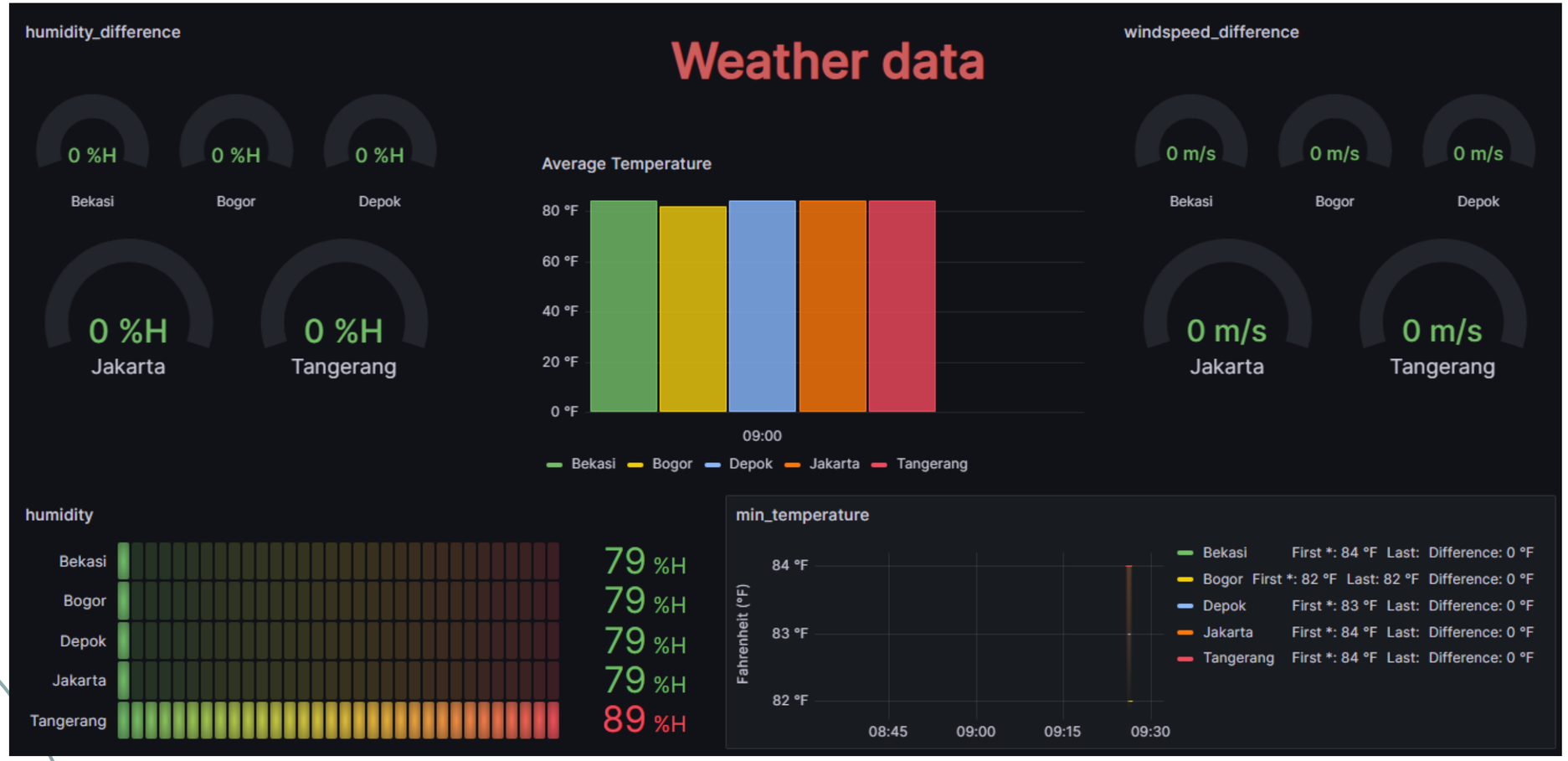
```
result = spark.sql("""
  SELECT   city_name,
           window.start AS start_timestamp,
           window.end AS end_timestamp,
           COUNT(*) AS num_observations_in_window,
           MIN(temp_min) AS min_temperature_in_window,
           MAX(temp_max) AS max_temperature_in_window,
           (MAX(temp_max)-MIN(temp_min)) as temp_difference,
           AVG(temperature) AS avg_temperature_in_window,
           humidity,
           (max(humidity)-min(humidity)) as humidity_difference,
           wind_speed,
           (max(wind_speed)-min(wind_speed)) as wind_speed_difference

  FROM      details AS t
  GROUP BY city_name,wind_speed,humidity, WINDOW(t.ts , '10 Second')
  """);
```

LOAD

city_name	start_timestamp	end_timestamp	num_observa	min_tempera	max_tempera	temp_differer	avg_temperat	humidity	humidity_dif
Bogor	2024-02-04 01:50:50.000	2024-02-04 01:51:00.000	1	81	81	0	81	82	
Bekasi	2024-02-04 02:00:30.000	2024-02-04 02:00:40.000	1	81	84	0	81	83	
Tangerang	2024-02-04 02:00:30.000	2024-02-04 02:00:40.000	1	81	85	0	82	83	
Bogor	2024-02-04 02:00:40.000	2024-02-04 02:00:50.000	1	78	82	0	81	82	
Jakarta	2024-02-04 02:00:40.000	2024-02-04 02:00:50.000	1	81	85	0	82	83	
Depok	2024-02-04 02:00:50.000	2024-02-04 02:01:00.000	1	80	84	0	82	83	
Tangerang	2024-02-04 02:00:50.000	2024-02-04 02:01:00.000	1	81	85	0	82	83	
Jakarta	2024-02-04 02:01:00.000	2024-02-04 02:01:10.000	1	81	85	0	82	83	
Bekasi	2024-02-04 02:01:00.000	2024-02-04 02:01:10.000	1	81	84	0	81	83	
Bogor	2024-02-04 02:01:10.000	2024-02-04 02:01:20.000	1	78	82	0	81	82	
Depok	2024-02-04 02:01:10.000	2024-02-04 02:01:20.000	1	80	84	0	82	83	
Tangerang	2024-02-04 02:01:20.000	2024-02-04 02:01:30.000	1	81	85	0	82	83	
Bekasi	2024-02-04 02:01:30.000	2024-02-04 02:01:40.000	1	81	84	0	81	83	
Jakarta	2024-02-04 02:01:30.000	2024-02-04 02:01:40.000	1	81	85	0	82	83	
Bogor	2024-02-04 02:01:40.000	2024-02-04 02:01:50.000	1	78	82	0	81	82	
Depok	2024-02-04 02:01:40.000	2024-02-04 02:01:50.000	1	80	84	0	82	83	
Bekasi	2024-02-04 02:01:50.000	2024-02-04 02:02:00.000	1	81	84	0	81	83	
Tangerang	2024-02-04 02:01:50.000	2024-02-04 02:02:00.000	1	81	85	0	82	83	
Jakarta	2024-02-04 02:02:00.000	2024-02-04 02:02:10.000	1	81	85	0	82	83	
Bogor	2024-02-04 02:02:00.000	2024-02-04 02:02:10.000	1	78	82	0	81	82	

DASHBOARD


humidity_difference
Weather data
windspeed_difference
0 %H
Bekasi
0 %H
Bogor
0 %H
Depok
Average Temperature
80 °F
60 °F
40 °F
20 °F
0 °F
09:00
0 m/s
Bekasi
0 m/s
Bogor
0 m/s
Depok
0 %H
Jakarta
0 %H
Tangerang
0 m/s
Jakarta
0 m/s
Tangerang
Bekasi
Bogor
Depok
Jakarta
Tangerang
humidity
Bekasi
Bogor
Depok
Jakarta
Tangerang
79 %H
79 %H
79 %H
79 %H
89 %H
min_temperature
84 °F
83 °F
82 °F
Fahrenheit (°F)
08:45
09:00
09:15
09:30
Bekasi First *: 84 °F Last: Difference: 0 °F
Bogor First *: 82 °F Last: 82 °F Difference: 0 °F
Depok First *: 83 °F Last: Difference: 0 °F
Jakarta First *: 84 °F Last: Difference: 0 °F
Tangerang First *: 84 °F Last: Difference: 0 °F

THANK YOU