

DISTRIBUTED SYSTEMS PROJECT

■ The power of Apache Flink

Project requirements

Theoretical project requirements:

1. Study of the **Flink**'s **architecture**.
2. Study of the most important **mechanisms** and **features**.
3. Comprehensive overview of the **DataStream API**.
4. “*Quick roundup*” of the **Flink Command Line** interface.
5. Point out the most important **advantage** and **disadvantages** of **Apache Flink**.

Project requirements

Practical project requirements:

1. Implementing **tweets** consuming application.
2. Point out the features of **Data Stream API**.
3. Testing scenarios to point out how **Flink** handles:
 - a. Out-of-order events
 - b. Failure
4. Utilization of external technologies for metric visualization (**Prometheus**)

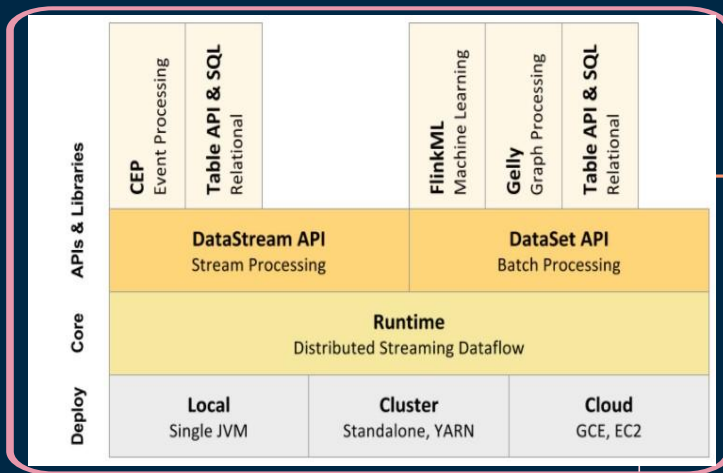
Theoretical part

01

Flink's architecture and software stack

The most important components are:

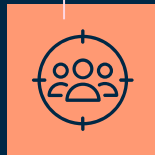
- **Deploy**
- **Core processing**
- **APIs & libraries**



Execution pattern

Master-worker pattern

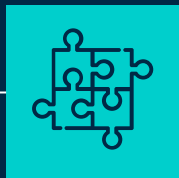
JobManager
Master process



TaskManager
Worker process

Handling Backpressure

Flink's innovative mechanisms



01

Checkpointing

Checkpoints and barriers.



02

Savepointing

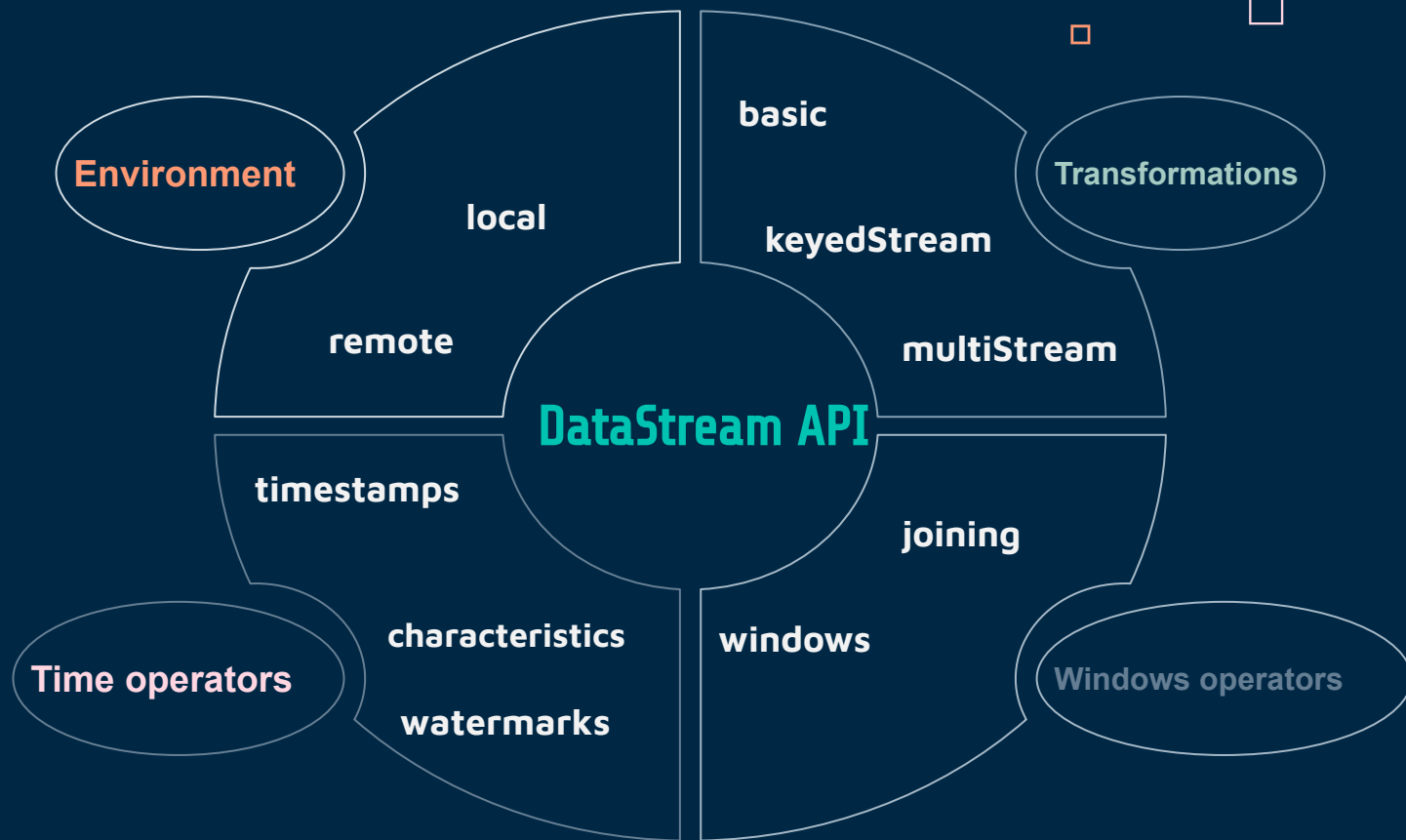
Savepoints.



03

Watermarking

Watermarks.



Practical part

02

TESTING SCENARIOS

01

Real-time tweets stream
filtered by language.

—EnglishTweetsFiltering

02

Using a control stream to
filter real-time tweets.

—TerminalTweetsFiltering

03

Most used tweets hashtag
for a specified interval.

—TopHashtag

04

Counting tweets per
language.

—TweetsPerLanguage

05

Non-real time: Testing
out-of-order events.

—TweetsWatermarked

06

Non-real time: Testing
Job failure by killing resources.

—JobRecovery

Deployment and metrics

Docker & docker-compose

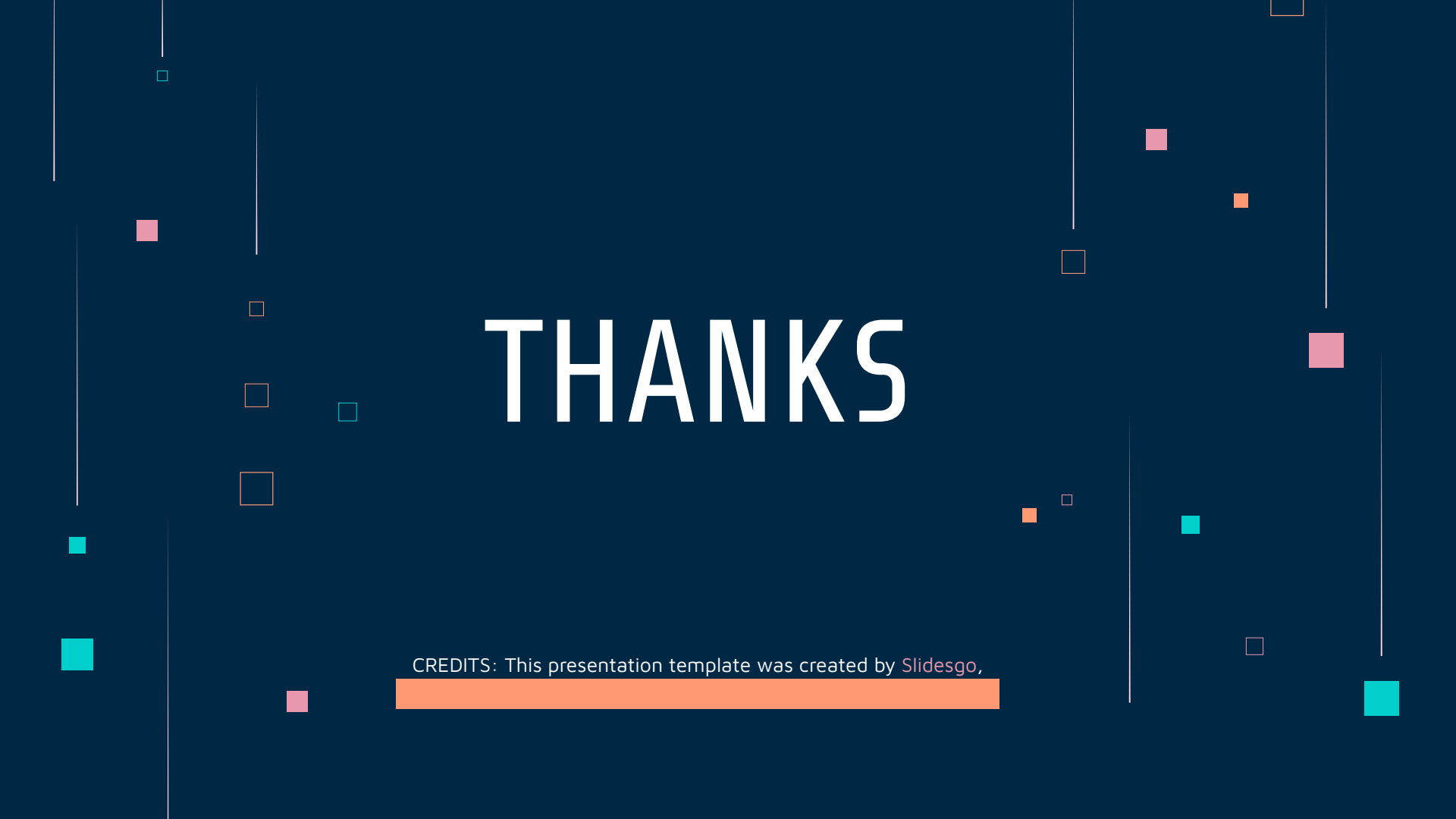
The image of the project to be build is **twitter-flink** image.

Resources configuration using:

- *flink-conf.yaml*
- *prometheus.yml*

Prometheus

An open-source systems monitoring and alerting toolkit



THANKS

CREDITS: This presentation template was created by [Slidesgo](#),

