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Subject :

Development of a solution for real-time analysis of customer responses to customer satisfaction surveys (NPS)

"Data/Event Stream Processing"

Context:

As part of a **customer satisfaction survey**, Telecom Djezzy is looking to develop a streaming application to calculate **NPS** in real-time, based on the feedback based on customer feedback, and visualize the data in a dynamic dashboard (using Grafana).

Internship duration:

The project will start from September 27th, 2023, and end on February 8th, 2024.

NB: The internship will be carried out in pairs.

Internship objectives:

- Working in the context of "Real Time Analytics" here are the project objectives:
- Become familiar with the different types of APIs predefined in Apache Flink and Kafka and exploit the most appropriate ones for agency use cases.
- Develop an Apache Flink streaming application that will handle (filtering/modifying/aggregating...) responses (events) from clients in real time.
- Establish the connection between Apache Kafka and Flink (using Connector)
- Assimilate GitOps workflow to be able to implement it, with the possibility of
- Github for source code management and change tracking (optional).
- Use Docker for the creation and execution of container images, ensuring the consistency of the environment.
- Conclude with output use cases / Create a real-time Dashboard.
- Deploy the solution on Kubernetes to test container orchestration (Optional)

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Internship plan :

Learning phase and documentation:

- Familiarization with Apache Kafka and Flink concepts.
- Introduction to Docker.
- Acquire necessary Java skills.
- Detailed review of project specifications and objectives in a meeting with the internship manager and data modeling
- Start developing the implementation logic for our Flink application.

Kafka configuration phase :

Apache Kafka is a streaming data platform.

- Set up the Kafka environment.
- Define the necessary configurations, such as data/events ingestion (incoming flows).

Apache Flink application design phase :

- Needs analysis and design of the overall application architecture.
- Apache Flink application development phase:
- Development of an output-driven streaming application according to needs, using a (Design for) approach
- Establish the connection between Apache Kafka and Flink so that the latter can read and process this stream of incoming events in real-time.

Containerization :

- Creation of Docker images for project components.
- Test execution of Docker images locally.

Visualization phase (Solution/Output) :

- Establish a real-time dashboard that will enable real-time visualization of customer satisfaction metrics (depending on the desired use cases) calculated by the application.

Internship report writing phase and preparation for oral presentation:

- Drafting of internship report and preparing the PowerPoint for presentation.

Technologies used:

- Java
- Apache Maven
- IDE (IntelliJ/VS Code)
- Apache Flink
- Apache Kafka
- Docker
- APIs
- Visualization tool (Grafana)
- Kubernetes (Optional)

Role and collaboration between trainee pairs:

- Establish the connection between Apache Flink and Kafka.
- Development of the Apache Flink application in Java.
- Containerization using Docker.
- Collaboration on the use of the real-time dashboard visualization tool (Grafana).
- Configuration of monitoring tool (Prometheus) for performance (Optional)
- Kubernetes deployment (Optional)

NB: The choice of tools or technologies may vary according to requirements.