Assignment: Market Data Aggregator

D2X Group

September 2023

Introduction

Financial Market Data published by exchanges allows participants to manage their interests in financial instruments by entering buy and sell orders. Financial Institutions need to process data in real-time to capture opportunities or manage their risks. During this assignment, you will implement a simplified real-time data ingestion pipeline using Kafka. You will retrieve trades from Deribit and are expected to build the necessary components to ingest, process, and store the data in real-time. The assignment consists of the following components:

- **Set environment**: create a Docker-compose file with the minimum components to deploy a Kafka cluster and a PostgreSQL database
- **Create topics**: Create two topics:
  - trades: containing the individual trade records. Ensure that the topic can handle a high volume of data.
  - ema: containing the exponential moving average over the past 5 minutes.
- **Producer Application**: Create a Producer application using Rust to retrieve trades from the get last trades by instrument REST API endpoint.
- **EMA Aggregator**: Create a Consumer application to consume raw trades from the trades topic and produce 5-min weighted average prices to the ema topic.
- **PostgreSQL Sink**: Create a Kafka Sink Consumer to stream all the raw trades to a PostgreSQL database.

Requirements

The interview assignment only has a few requirements:

- The source code is written in Rust
- Create a productive development environment that can be deployed through a single command (docker compose up)
- Clearly document any design/configuration considerations
- Monitoring of the health of the Kafka Producer, EMA Aggregator, and PostgreSQL Sink Consumer is nice to have.
- Subscribing to the WebSocket based trade subscription https://docs.deribit.com/trades-kind-currency-nterval is a nice to have