

Atelier 2 : Implémentation en Java.

Objectif : Mise en œuvre en Java des concepts de **producer** et **consumer**.

Dans cet atelier nous allons implémenter en Java (et en se basant sur le framework Spring), les concepts de base de la technologie Kafka.

Pré-requis :

Quelques pré-requis sont nécessaire pour cet atelier :

- Java
- Un IDE (Eclipse de préférence)
- Atelier 1

Étape 1 : Création du projet et ajout des dépendances.

The screenshot shows the Spring Initializr web interface. It's a configuration tool for creating Spring-based projects. The interface includes:

- Project**: Set to "Gradle - Groovy". Other options include "Gradle - Kotlin" and "Maven".
- Language**: Set to "Java". Other options include "Kotlin" and "Groovy".
- Spring Boot**: Set to "3.2.2". Other versions listed are "3.3.0 (SNAPSHOT)", "3.3.0 (M1)", "3.2.3 (SNAPSHOT)", "3.1.9 (SNAPSHOT)", and "3.1.8".
- Dependencies**: A button labeled "ADD DEPENDENCIES... CTRL + B". Below it, a message says "No dependency selected".
- Project Metadata**: Fields for Group (set to "com.example"), Artifact (set to "demo"), Name (set to "demo"), and Description (set to "Demo project for Spring Boot").
- Buttons at the bottom**: "GENERATE" (CTRL + ⌘), "EXPLORE" (CTRL + SPACE), and "SHARE...".

On ajoute ensuite l'ensemble des dépendances nécessaires au projet :

- Spring starter Web
- Spring kafka

Etape 2 : Le package producer

On commence par créer une classe de configuration du Producer : **KafkaProducerConfig**

```
package com.entreprise.kafkaIntegration.producer;

import java.util.HashMap;
import java.util.Map;

import org.apache.kafka.clients.producer.ProducerConfig;
import org.apache.kafka.common.serialization.StringSerializer;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.kafka.core.DefaultKafkaProducerFactory;
import org.springframework.kafka.core.KafkaTemplate;
import org.springframework.kafka.core.ProducerFactory;

@Configuration
public class KafkaProducerConfig {
    @Bean
    public ProducerFactory<String, String> producerFactory() {
        Map<String, Object> configProps = new HashMap<>();

        configProps.put(ProducerConfig.BOOTSTRAP_SERVERS_CONFIG, "localhost:9092");
        configProps.put(ProducerConfig.KEY_SERIALIZER_CLASS_CONFIG, StringSerializer.class);
        configProps.put(ProducerConfig.VALUE_SERIALIZER_CLASS_CONFIG, StringSerializer.class);
        return new DefaultKafkaProducerFactory<>(configProps);
    }

    @Bean
    public KafkaTemplate<String, String> kafkaTemplate() {
        return new KafkaTemplate<>(producerFactory());
    }
}
```

On crée une classe qui intègre une méthode sendMessage, permettant l'envoie de messages sur le broker kafka. C'est donc la classe **MessageProducer**.

```
package com.entreprise.kafkaIntegration.producer;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.kafka.core.KafkaTemplate;
import org.springframework.stereotype.Component;

@Component
public class MessageProducer {

    @Autowired
    private KafkaTemplate<String, String> kafkaTemplate;

    public void sendMessage(String myorsystopic, String message) {
        kafkaTemplate.send(myorsystopic, message);
    }
}
```

Etape 3 : Package Controller

Cette classe Controller représente le point d'entrée de l'application. Le méthode sendMessage définie en son sein est mobilisée à partir du path uri
http://localhost:8080/send?message=first_message_test_1

```
package com.entreprise.kafkaIntegration.controller;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.RestController;

import com.entreprise.kafkaIntegration.producer.MessageProducer;

@RestController
public class KafkaController {

    @Autowired
    private MessageProducer messageProducer;

    @PostMapping("/send")
    public String sendMessage(@RequestParam("message") String message) {
        messageProducer.sendMessage("myorsystopic", message);
        return "Message sent :" + message;
    }
}
```

Etape 4 : Package Consumer

Classe de configuration du consumer : ConsumerConfig

```
package com.entreprise.kafkaIntegration.consumer;

import java.util.HashMap;
import java.util.Map;

import org.apache.kafka.clients.consumer.ConsumerConfig;
import org.apache.kafka.common.serialization.StringDeserializer;
import org.springframework.context.annotation.Bean;
import org.springframework.kafka.config.ConcurrentKafkaListenerContainerFactory;
import org.springframework.kafka.core.ConsumerFactory;
import org.springframework.kafka.core.DefaultKafkaConsumerFactory;

public class KafkaConsumerConfig {

    @Bean
    public ConsumerFactory<String, String> consumerFactory() {
        Map<String, Object> configProps = new HashMap<>();
        configProps.put(ConsumerConfig.BOOTSTRAP_SERVERS_CONFIG, "localhost:9092");
        configProps.put(ConsumerConfig.GROUP_ID_CONFIG, "my-group-id");
        configProps.put(ConsumerConfig.KEY_DESERIALIZER_CLASS_CONFIG, StringDeserializer.class);
        configProps.put(ConsumerConfig.VALUE_DESERIALIZER_CLASS_CONFIG, StringDeserializer.class);
        return new DefaultKafkaConsumerFactory<>(configProps);
    }

    public ConcurrentKafkaListenerContainerFactory<String, String> kafkaListenerContainerFactory() {
        ConcurrentKafkaListenerContainerFactory<String, String> factory = new ConcurrentKafkaListenerContainerFactory<>();
        factory.setConsumerFactory(consumerFactory());
        return factory;
    }
}
```

MessageConsumer intégrant la méthode **listen**, qui consomme le message envoyé par le Producer.

```
package com.entreprise.kafkaIntegration.consumer;

import org.springframework.kafka.annotation.KafkaListener;
import org.springframework.stereotype.Component;

@Component
public class MessageConsumer {

    @KafkaListener(topics = "myorsystopic", groupId = "my-group-id")
    public void listen(String message) {
        System.out.println("Received message : " + message);
    }
}
```

Exécution de la Spring-Boot Application.

On teste l'envoie de la requête sur Postman

http://localhost:8080/send?message=first_message_test_1

On consulte la console

The screenshot shows the Postman interface with the following details:

- HTTP Method:** POST
- URL:** http://localhost:8080/send?message=first_message_test_1
- Params:** A table showing two query parameters:

Key	Value	Description	Bulk Edit
message	first_message_test_1		
Key	Value	Description	
- Body:** Text area containing the message sent: first_message_test_1
- Headers:** (5)
- Tests:** Status: 200 OK, Time: 510 ms, Size: 198 B
- Buttons:** Save, Send