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Apache Kafka

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=> Apache Kafka is a distributed streaming platform

=> Apache Kafka is called as Message Broker

=> Apache Kafka is used to process real time data feeds with high throughput and low latency

Ex : flights data, sensors data, stocks data, news data, social media etc....

=> Kafka works based on Publisher and Subscriber model

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Kafka Terminology

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Zookeeper
Kafka Server
Kafka Topic
Message
Publisher
Subscriber

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Kafka APIs

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Connector API
Publisher API
Subscriber API
Streams API

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Spring Boot + Apache Kafka Application

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Step-1 : Download Zookeeper from below URL

URL : <http://mirrors.estointernet.in/apache/zookeeper/stable/>

Step-2 : Download Apache Kafka from below URL

URL : <http://mirrors.estointernet.in/apache/kafka/>

Step-3 : Set Path to ZOOKEEPER in Environment variables upto bin folder

Note: Copy zookeeper.properties and server.properties files from kafka/config folder to kafka/bin/windows folder.

Step-4 : Start Zookeeper server using below command from kafka/bin/windows folder

Command : zookeeper-server-start.bat zookeeper.properties

Step-5: Start Kafka Server using below command from Kafka folder

Command : kafka-server-start.bat server.properties

Step-6 : Create Kafka Topic using below command from kafka/bin/windows folder

Command : kafka-topics.bat --create --bootstrap-server localhost:9092 --replication-factor 1 --partitions 1 --topic amazon_orders_topic

Step-7 : View created Topics using below command

Command : kafka-topics.bat --list --bootstrap-server localhost:9092

```
#####  
Kafka Producer App Development  
#####
```

```
=====
```

1) Add below dependencies

```
=====
```

```
<dependencies>
```

```
<dependency>
```

```
<groupId>org.springframework.boot</groupId>
```

```
<artifactId>spring-boot-starter-web</artifactId>
```

```
</dependency>
```

```
<dependency>
```

```
<groupId>org.apache.kafka</groupId>
```

```
<artifactId>kafka-streams</artifactId>
```

```
</dependency>
```

```
<dependency>
```

```
<groupId>org.springframework.kafka</groupId>
```

```
<artifactId>spring-kafka</artifactId>
```

```
</dependency>
```

```
<dependency>
```

```
<groupId>com.fasterxml.jackson.core</groupId>
```

```
<artifactId>jackson-databind</artifactId>
```

```
</dependency>
```

```
<dependency>
```

```
<groupId>org.springframework.boot</groupId>
```

```
<artifactId>spring-boot-starter-test</artifactId>
```

```
<scope>test</scope>
```

```
</dependency>
```

```
<dependency>
```

```
<groupId>org.springframework.kafka</groupId>
```

```
<artifactId>spring-kafka-test</artifactId>
```

```
<scope>test</scope>
```

```
</dependency>
```

```
</dependencies>
```

```
=====
2) Create Kafka Constants class
=====
```

```
public class AppConstants {

    public static final String TOPIC = "ashokit_order_topic";
    public static final String HOST = "localhost:9092";

}
```

```
=====
3) Create Model class to represent data
=====
```

```
@Data
public class Order {

    private String id;
    private Double price;
    private String email;

}
```

```
=====
4) Create Kafka Producer Config class
=====
```

```
@Configuration
public class KafkaProduceConfig {

    @Bean
    public ProducerFactory<String, Order> producerFactory() {

        Map<String, Object> configProps = new HashMap<>();

        configProps.put(ProducerConfig.BOOTSTRAP_SERVERS_CONFIG, AppConstants.HOST);
        configProps.put(ProducerConfig.KEY_SERIALIZER_CLASS_CONFIG, StringSerializer.class);
        configProps.put(ProducerConfig.VALUE_SERIALIZER_CLASS_CONFIG, JsonSerializer.class);

        return new DefaultKafkaProducerFactory<>(configProps);
    }

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

}
```

```
=====
4) Create Service Class
```

=====

```
@Service
public class OrderService {

    @Autowired
    private KafkaTemplate<String, Order> kafkaTemplate;

    public String addMsg(Order order) {

        // publish msg to kafka topic
        kafkaTemplate.send(AppConstants.TOPIC, order);

        return "Msg Published To Kafka Topic";
    }
}
```

=====

5) Create RestController classs

=====

```
@RestController
public class OrderRestController {

    @Autowired
    private OrderService service;

    @PostMapping("/order")
    public String createOrder(@RequestBody Order order) {
        String msg = service.addMsg(order);
        return msg;
    }

}
```


Kafka Subscriber App Development
#####

=====

1) Add below dependencies

=====

```
<dependencies>
<dependency>
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter-web</artifactId>
</dependency>
```

```
<dependency>
<groupId>org.apache.kafka</groupId>
<artifactId>kafka-streams</artifactId>
```

```

</dependency>
<dependency>
<groupId>org.springframework.kafka</groupId>
<artifactId>spring-kafka</artifactId>
</dependency>

<dependency>
<groupId>com.fasterxml.jackson.core</groupId>
<artifactId>jackson-databind</artifactId>
</dependency>

<dependency>
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter-test</artifactId>
<scope>test</scope>
</dependency>
<dependency>
<groupId>org.springframework.kafka</groupId>
<artifactId>spring-kafka-test</artifactId>
<scope>test</scope>
</dependency>
</dependencies>

```

```

=====
2) Create Constants class
=====

```

```

public class KafkaConstants {

public static final String TOPIC = "ashokit_order_topic";
public static final String HOST = "localhost:9092";

}

```

```

=====
3) Create Model class
=====

```

```

@Data
public class Order {

private String id;
private Double price;
private String email;

}

```

```

=====
4) Create Consumer Config
=====

```

```

@Configuration

```

```

public class KafkaConsumerConfig {

@Bean
public ConsumerFactory<String, Order> consumerFactory() {

Map<String, Object> configProps = new HashMap<String, Object>();

configProps.put(ConsumerConfig.BOOTSTRAP_SERVERS_CONFIG, AppConstants.HOST);
configProps.put(ConsumerConfig.KEY_DESERIALIZER_CLASS_CONFIG, StringDeserializer.class);
configProps.put(ConsumerConfig.VALUE_DESERIALIZER_CLASS_CONFIG,
JsonDeserializer.class);

return new DefaultKafkaConsumerFactory<>(configProps, new StringDeserializer(), new
JsonDeserializer<>());

}

```

```

@Bean
public ConcurrentKafkaListenerContainerFactory<String, Order> kafkaListnerFactory() {

ConcurrentKafkaListenerContainerFactory<String, Order> factory =
new ConcurrentKafkaListenerContainerFactory<>();

factory.setConsumerFactory(consumerFactory());

return factory;
}
}

```

=====

5) Add below method in boot app start class

=====

```

@KafkaListener(topics = AppConstants.TOPIC, groupId="group_ashokit_order")
public void subscribeMsg(String order) {
System.out.print("*** Msg Recieved From Kafka *** :: ");
System.out.println(order);
//logic
}

```

=====

6) Run the application

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Send Request to Producer app and observer Subscriber app console

```

{
"id" : "OD101",
"price" : 200.00,
"email" : "smith@gmail.com"
}

```