

# Assignment Report on Real-Time E-commerce Order Processing System Using Kafka

*Submitted by:* Sreejesh S Nair (202318001)

To develop a Kafka-based system for managing e-commerce orders in real-time, you'll need to set up producers, consumers, and implement message filtering logic. Below are the steps you can follow to achieve this:

## Step 1: Set Up Kafka

1. **Install Kafka:** Ensure Kafka is installed and running on your system or a server.
  2. **Create Kafka Topics:** Created two Kafka topics `kafkademo1` and `kafkademo2` each for inventory and delivery respectively.
- **Using the below commands (in Terminal or command center) we can initialize zookeeper and kafka first, then create relevant topics and finally initialize producer and consumer for each topic**

**zookeeper** - `./bin/zookeeper-server-start.sh ./config/zookeeper.properties`

**server** - `./bin/kafka-server-start.sh ./config/server.properties`

**Create topic** - `./bin/kafka-topics.sh --create --topic topicBDPdemo --bootstrap-server localhost:9092`

**producer** - `./bin/kafka-console-producer.sh --topic topicBDPdemo1 --bootstrap-server localhost:9092`

**consumer** - `./bin/kafka-console-consumer.sh --topic topicBDPdemo1 --bootstrap-server localhost:9092 --from-beginning`

## Step 2: Implement Kafka Producers

**Filtering data by type ( “Inventory” or “Delivery”) and sending the data to their respective producers**

1. **Inventory Orders Producer (`inventory_orders_producer`):**
  - This producer takes filtered type “inventory” that has to be sent to consumer of inventory.
  - Implement a Kafka producer that reads inventory-related events from a data source (like a database or event stream) and sends messages with **type** set to **inventory** to the **kafkademo1** topic.
2. **Delivery Orders Producer (`delivery_orders_producer`):**
  - This producer takes filtered type “delivery” that has to be sent to consumer of delivery.
  - Implement a Kafka producer that reads delivery-related events from a data source (like a database or event stream) and sends messages with **type** set to **delivery** to the **kafkademo2** topic.

### Step 3: Implement Kafka Consumers

### 1. Inventory Data Consumer (inventory\_data\_consumer):

- Configure a Kafka consumer that subscribes to the **kafkademo1 (Inventory)** topic.
- Implement any logic to process inventory messages received by updating inventory databases or systems accordingly.

## 2. Delivery Data Consumer (delivery\_data\_consumer):

- Set up a Kafka consumer for the **kafkademo2 (delivery)** topic.
- Develop logic to handle delivery-related messages such as scheduling deliveries, updating delivery status, and notifying customers.

### Step 4: Develop Message Filtering Logic

### 1. Producer Message Filtering:

- Message filtering has been implemented in producer where if the message “type” is inventory it is sent to **kafkademo1** topic and received by consumer of inventory.
- Similar strategy has been implemented for delivery.

Output:

Left side shows the producers and right side shows the consumer for each topics.

```
kafka - java -Xmx512M -server -XX:+UseG1GC -XX:MaxGCPauseMillis=2...

Last login: Tue May 7 19:43:39 on tty8064
(base) sreejeshnar@SreejeshetMacBook-Air: ~ % cd /Users/sreejeshnar/Downloads
~/Downloads
(base) sreejeshnar@sreejeshetMacBook-Air: kafka % ./bin/kafka-console-producer.sh
--topic topicBDPdemo1 --bootstrap-server localhost:9092
zsh: command not found: ./bin/kafka-console-producer.sh
(base) sreejeshnar@sreejeshetMacBook-Air: kafka % ./bin/kafka-console-producer.sh
--topic topicBDPdemo1 --bootstrap-server localhost:9092
zsh: no such file or directory: ./bin/kafka-console-producer.sh
(base) sreejeshnar@sreejeshetMacBook-Air: kafka % ./bin/kafka-console-producer.sh
--topic topicBDPdemo1 --bootstrap-server localhost:9092
Inventory data
new inventory data
[2024-05-07 21:19:56,107] WARN [Producer clientId=console-producer] Connection
to node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be a
vailable. (org.apache.kafka.clients.NetworkClient)
[2024-05-07 21:19:56,217] WARN [Producer clientId=console-producer] Connection t
o node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be av
ailable. (org.apache.kafka.clients.NetworkClient)
[2024-05-07 21:19:56,489] WARN [Producer clientId=console-producer] Connection t
o node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be av
ailable. (org.apache.kafka.clients.NetworkClient)

kafka - java -Xmx512M -server -XX:+UseG1GC -XX:MaxGCPauseMillis=2...

Last login: Tue May 7 19:47:55 on tty8064
(base) sreejeshnar@SreejeshetMacBook-Air: ~ % cd /Users/sreejeshnar/Downloads
~/Downloads/KAFKA/1/kafka
(base) sreejeshnar@sreejeshetMacBook-Air: kafka % ./bin/kafka-console-producer.sh
--topic topicBDPdemo2 --bootstrap-server localhost:9092
zsh: command not found: ./bin/kafka-console-producer.sh
(base) sreejeshnar@sreejeshetMacBook-Air: kafka % ./bin/kafka-console-producer.sh
--topic topicBDPdemo2 --bootstrap-server localhost:9092
new data
new delivery
[2024-05-07 21:19:56,108] WARN [Producer clientId=console-producer] Connection
to node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be a
vailable. (org.apache.kafka.clients.NetworkClient)
[2024-05-07 21:19:56,241] WARN [Producer clientId=console-producer] Connection t
o node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be av
ailable. (org.apache.kafka.clients.NetworkClient)
[2024-05-07 21:19:56,480] WARN [Producer clientId=console-producer] Connection t
o node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be av
ailable. (org.apache.kafka.clients.NetworkClient)
[2024-05-07 21:19:56,499] WARN [Producer clientId=console-producer] Connection t
o node 0 (localhost/127.0.0.1:9092) could not be established. Node may not be av
ailable. (org.apache.kafka.clients.NetworkClient)
[2024-05-07 21:19:57,095] WARN [Producer clientId=console-producer] Connection t
```

By following these steps and best practices, a robust Kafka-based e-commerce order management system capable of real-time inventory management and delivery processing has been developed.

Note: There are some errors in the screenshot which occurred due to the movement of the location of the kafka files. So ensure that they are stored in a place where changes are not made.