

## Kafka Console Consumer CLI

Is lecture mein hum seekhenge ki **Kafka Topics** se data kaise read (consume) karte hain using CLI. Hum cover karenge:

1. **Tail Consumption:** Sirf naye (live) messages padhna.
  2. **From Beginning:** Topic ke start se purane messages padhna.
  3. **Formatting:** Message ke saath Key, Timestamp aur Partition number dekhna.
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### 1. Prerequisites (Setup)

Ordering aur Partitions ka behavior samajhne ke liye, hum ek naya topic banayenge jisme **3 Partitions** honge.

#### Step 1: Create Topic with 3 Partitions

```
kafka-topics.sh --bootstrap-server <YOUR_SERVER> --create --topic second_topic --partitions 3
```

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### 2. Basic Consumer (Default Behavior)

By default, Kafka Consumer sirf **naye messages** padhta hai jo consumer start hone ke **baad** aate hain (Live data).

**Command:**

```
kafka-console-consumer.sh --bootstrap-server <YOUR_SERVER> --topic second_topic
```

- **Observation:** Jab aap ye command run karenge, screen par kuch nahi dikhega (blank rahega). Kyunki abhi koi naya data nahi aaya hai.

**Test Scenario:**

1. Ek terminal mein Consumer chalayein.
  2. Dusre terminal mein Producer chalayein aur message bhejin ( **Hello World** ).
  3. Aap dekhenge ki Consumer turant wo message dikha dega.
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### 3. Producing Data (For Testing)

Testing ke liye hum Producer use karenge. Instructor ne ek **Special Property** use ki hai: **RoundRobinPartitioner**.

- **Why?** Taaki data forcefully alag-alag partitions (0, 1, 2) mein distribute ho aur hum ordering check kar sakein.
- **Warning:** Production mein iska use na karein (Efficiency kam hoti hai).

**Producer Command:**

```
kafka-console-producer.sh --bootstrap-server <YOUR_SERVER> --topic second_topic --producer-property partitioner.class=org.apache.kafka.clients.producer.RoundRobinPartitioner
```

- **Input:** **hello world** , **my name is stephane** , **learning kafka** ... (3-4 messages bhejin).
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### 4. Reading from Beginning (History)

Agar aapko wo messages padhne hain jo consumer start hone se pehle bheje gaye the, toh **--from-beginning** flag use karein.

**Command:**

```
kafka-console-consumer.sh --bootstrap-server <YOUR_SERVER> --topic second_topic --from-beginning
```

**Important Observation (Ordering Issue):** Aap notice karenge ki messages ka order **alag (shuffled)** ho sakta hai.

- *Example:* Aapne bheja tha **1, 2, 3, 4**.
- *Output:* Shayad **1, 3, 2, 4** dikhe.

**Reason:** Topic mein **3 Partitions** hain. Consumer teeno partitions se parallel mein data padh raha hai.

- **Global Ordering guarantee nahi hoti.**
- **Partition ke andar Ordering guarantee hoti hai.**

**Text Diagram: Multi-Partition Reading**

```
Partition 0: [ Msg A, Msg C ]
Partition 1: [ Msg B ]
Partition 2: [ Msg D ]

Consumer reads all at once:
Output might be: Msg A, Msg B, Msg D, Msg C (Mixed Order)
```

## 5. Advanced Formatting (Showing Metadata)

By default, Consumer sirf **Value** dikhata hai. Agar humein dekhna hai ki message kis **Partition** mein gaya, uska **Key** kya tha, aur **Time** kya tha, toh humein **formatter** use karna padega.

**Complex Command:**

```
kafka-console-consumer.sh --bootstrap-server <YOUR_SERVER> --topic second_topic --formatter kafka.tools.DefaultMessageFormatter --property print.timestamp=true --property print.key=true --property print.value=true --property print.partition=true --from-beginning
```

**Output Example:**

```
CreateTime:1634... Partition:2 null my name is Stephane
CreateTime:1634... Partition:0 null learning kafka
CreateTime:1634... Partition:1 null hello world
```

**Analysis:**

- Yahan aap dekh sakte hain ki data alag-alag partitions (2, 0, 1) se aa raha hai.
- Agar aap sirf **Partition:2** ke messages dekhenge, toh wo hamesha correct order mein honge.

## Summary Checklist

- ☒ **Default Mode:** Sirf new messages read karta hai.
- ☒ **--from-beginning:** Purana sara data read karta hai.
- ☒ **Ordering:** Multiple partitions mein global order guarantee nahi hoti, messages mix ho sakte hain.
- ☒ **Formatters:** **--formatter** aur **--property** use karke hidden details (Partition No, Timestamp) dekh sakte hain.

**Next Step:** Consumer CLI clear hai? Ab hum **Consumer Groups** CLI ki taraf badhenge jahan hum seekhenge ki multiple consumers milkar kaise kaam karte hain. Would you like those notes?