Kafka Project Setup Guide on Windows with EC2 (Step-by-Step)

This guide is specially written for users on **Windows 11** using an **EC2 instance (Amazon Linux)** to run Kafka. It explains each command and step clearly.

✅PART 1: Prerequisites on Windows

1. Install Java 17 (LTS) on Windows

- You have already installed Java 17 successfully.
- To verify:

```
java -version
```

Output should show Java 17 LTS.

2. Install Python and Required Libraries

```
pip install kafka-python pandas boto3
```

✅PART 2: SSH into EC2 Instance

You already have your EC2 instance running and connected via SSH. Use the command:

```
ssh -i "kafka-stock-market-project.pem" ec2-user@<EC2-PUBLIC-IP>
```

Replace `<EC2-PUBLIC-IP>` with your instance's public IP address.

✅PART 3: Kafka Installation on EC2

1. Download Kafka on EC2

```
wget https://downloads.apache.org/kafka/3.3.1/kafka_2.12-3.3.1.tgz
```

- Downloads the Kafka package

2. Extract Kafka

```
tar -xvf kafka_2.12-3.3.1.tgz
```

- Extracts the compressed `.tgz` file into a directory.

3. Navigate into Kafka directory

```
cd kafka_2.12-3.3.1
```

4. Verify Java (on EC2)

```
java -version
```

If Java is not installed:

```
sudo yum install java-1.8.0-openjdk
```

Then re-run `java -version` to confirm.

✅PART 4: Start Kafka & Zookeeper on EC2

1. Start ZooKeeper

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

- ZooKeeper manages Kafka's distributed coordination.

💡 Run this command in one terminal. Keep it running.

2. Start Kafka Server (in NEW terminal/SSH window)

```
export KAFKA_HEAP_OPTS="-Xmx256M -Xms128M"
cd kafka_2.12-3.3.1
bin/kafka-server-start.sh config/server.properties
```

- Starts the Kafka broker (the messaging server).

3. Update `server.properties` for Public IP

Kafka by default listens on private IP. You must change:

```
sudo nano config/server.properties
```

Find this line:

```
#advertised.listeners=PLAINTEXT://your.host.name:9092
```

Replace it with:

```
advertised.listeners=PLAINTEXT://<YOUR-EC2-PUBLIC-IP>:9092
```

Then save (Ctrl+O, Enter, Ctrl+X) Restart Kafka server for changes to take effect.

✅PART 5: Create Kafka Topic

In a **third terminal**:

```
cd kafka_2.12-3.3.1
bin/kafka-topics.sh --create --topic demo_testing2 \
--bootstrap-server <YOUR-EC2-PUBLIC-IP>:9092 \
--replication-factor 1 --partitions 1
```

✅Output should confirm topic created

✅PART 6: Start Producer & Consumer

➕Start Console Producer (Terminal 4)

```
cd kafka_2.12-3.3.1
bin/kafka-console-producer.sh --topic demo_testing2 --bootstrap-server <YOUR-
EC2-PUBLIC-IP>:9092
```

- You can now type messages and hit Enter to send to the topic.

♑Start Console Consumer (Terminal 5)

```
cd kafka_2.12-3.3.1
bin/kafka-console-consumer.sh --topic demo_testing2 --bootstrap-server <YOUR-
EC2-PUBLIC-IP>:9092 --from-beginning
```

- Shows all messages from the topic.

Notes:

- Keep each command running in separate terminal/SSH windows.
- Replace `<YOUR-EC2-PUBLIC-IP>` with the actual IP of your EC2 instance.
- Open port 9092 in your **EC2 Security Group** to allow Kafka connections.

You're doing great!