Kafka Chat Application with C# - Step-by-Step Guide

# 📌 Introduction

This guide walks you through creating a Kafka-based chat application using C#. You'll build a Kafka Producer (to send messages) and a Kafka Consumer (to receive messages).

# ✅ Prerequisites

- Java JDK (for running Kafka)

- Apache Kafka (installed and extracted)

- Visual Studio with .NET Core Console App template

- NuGet package: Confluent.Kafka

# 🛠 Step 1: Set Up Kafka and Zookeeper

1. Open Command Prompt and go to Kafka's bin/windows directory:

cd C:\kafka\bin\windows

2. Start Zookeeper:

zookeeper-server-start.bat ..\..\config\zookeeper.properties

3. In a new Command Prompt, start Kafka:

kafka-server-start.bat ..\..\config\server.properties

# 📁 Step 2: Create Kafka Topic

In the same folder:

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

# ✍️ Step 3: Kafka Producer (Send Messages)

1. Create a new Console App project in Visual Studio named KafkaProducerApp.

2. Install the NuGet package: Confluent.Kafka

3. Replace Program.cs with the following code:

using System;  
using System.Threading.Tasks;  
using Confluent.Kafka;  
  
namespace KafkaProducerApp  
{  
 class Program  
 {  
 static async Task Main(string[] args)  
 {  
 var config = new ProducerConfig  
 {  
 BootstrapServers = "localhost:9092"  
 };  
  
 using var producer = new ProducerBuilder<Null, string>(config).Build();  
  
 Console.WriteLine("Kafka Producer started. Type messages to send. Type 'exit' to quit.");  
  
 while (true)  
 {  
 Console.Write("Enter message: ");  
 string message = Console.ReadLine();  
  
 if (message.ToLower() == "exit")  
 break;  
  
 var result = await producer.ProduceAsync("chat-topic", new Message<Null, string>  
 {  
 Value = message  
 });  
  
 Console.WriteLine($"Message sent to {result.TopicPartitionOffset}");  
 }  
 }  
 }  
}

# 📥 Step 4: Kafka Consumer (Receive Messages)

1. Create another Console App named KafkaConsumerApp.

2. Install the same NuGet package: Confluent.Kafka

3. Replace Program.cs with the following code:

using System;  
using System.Threading;  
using Confluent.Kafka;  
  
namespace KafkaConsumerApp  
{  
 class Program  
 {  
 static void Main(string[] args)  
 {  
 var config = new ConsumerConfig  
 {  
 GroupId = "chat-group",  
 BootstrapServers = "localhost:9092",  
 AutoOffsetReset = AutoOffsetReset.Earliest  
 };  
  
 using var consumer = new ConsumerBuilder<Ignore, string>(config).Build();  
 consumer.Subscribe("chat-topic");  
  
 Console.WriteLine("Kafka Consumer started. Listening for messages...\n");  
  
 try  
 {  
 while (true)  
 {  
 var message = consumer.Consume(CancellationToken.None);  
 Console.WriteLine($"Received: {message.Message.Value}");  
 }  
 }  
 catch (OperationCanceledException)  
 {  
 consumer.Close();  
 }  
 }  
 }  
}













