**Kafka Integration with C#:**

**SOLUTION :**

**Prerequisites**

1. **Install Apache Kafka and Zookeeper** (Windows):
   * Follow this guide to install Kafka:  
     🔗 [Step-by-Step Kafka Installation on Windows](https://www.c-sharpcorner.com/article/step-by-step-installation-and-configuration-guide-of-apache-kafka-on-windows-ope/)
   * After installation, start:
     + Zookeeper: bin\windows\zookeeper-server-start.bat config\zookeeper.properties
     + Kafka Server: bin\windows\kafka-server-start.bat config\server.properties
2. **Create Topic for Chat**
   * Open a new terminal: bin\windows\kafka-topics.bat --create --topic chat-topic --bootstrap-server localhost:9092 --partitions 1 --replication-factor 1

**Part 1: Console Chat App with Kafka**

**Step 1: Create a Console App**

dotnet new console -n KafkaConsoleChatApp

cd KafkaConsoleChatApp

**Step 2: Install Kafka NuGet package**

dotnet add package Confluent.Kafka

**Step 3: Create Producer (ChatProducer.cs)**

using System;

using Confluent.Kafka;

class ChatProducer

{

public static async Task SendMessage(string message)

{

var config = new ProducerConfig { BootstrapServers = "localhost:9092" };

using var producer = new ProducerBuilder<Null, string>(config).Build();

await producer.ProduceAsync("chat-topic", new Message<Null, string> { Value = message });

Console.WriteLine("Sent: " + message);

}

}

**Step 4: Create Consumer (ChatConsumer.cs)**

using System;

using Confluent.Kafka;

class ChatConsumer

{

public static void StartListening()

{

var config = new ConsumerConfig

{

BootstrapServers = "localhost:9092",

GroupId = "chat-group",

AutoOffsetReset = AutoOffsetReset.Earliest

};

using var consumer = new ConsumerBuilder<Ignore, string>(config).Build();

consumer.Subscribe("chat-topic");

Console.WriteLine("Listening for messages...");

while (true)

{

var cr = consumer.Consume();

Console.WriteLine("Received: " + cr.Message.Value);

}

}

}

**Step 5: Program.cs**

using System;

using System.Threading.Tasks;

class Program

{

static async Task Main(string[] args)

{

Console.WriteLine("Enter mode: [send/receive]");

var mode = Console.ReadLine();

if (mode == "send")

{

while (true)

{

Console.Write("Message: ");

var msg = Console.ReadLine();

await ChatProducer.SendMessage(msg);

}

}

else if (mode == "receive")

{

ChatConsumer.StartListening();

}

else

{

Console.WriteLine("Invalid mode.");

}

}

}

**Run Console App**

**Send mode:**

dotnet run

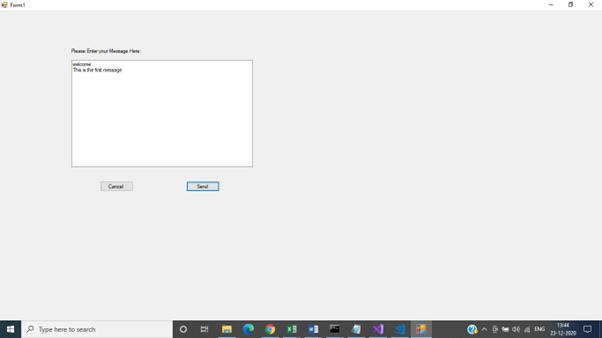
# Enter: send

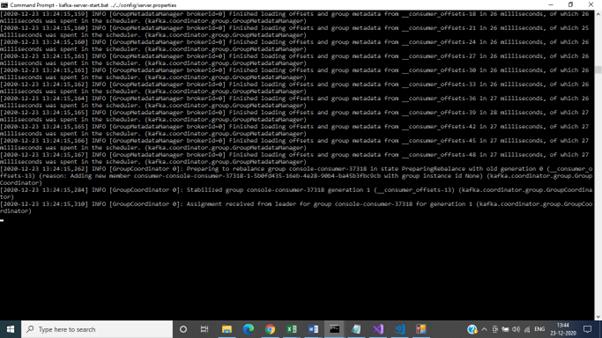
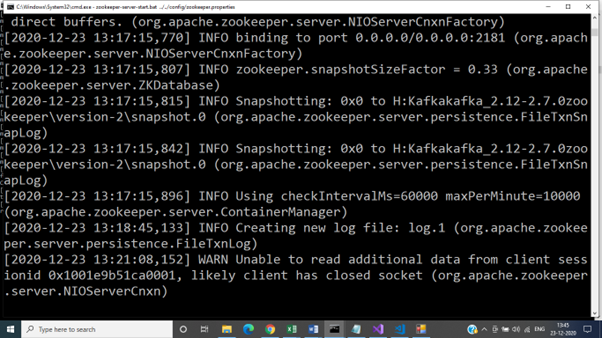
**Receive mode (in another terminal):**

dotnet run

# Enter: receive

**OUTPUT :**





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