

# Kafka by Confluent - Confluent Developer Skills for Building Apache Kafka

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**Course Number: AK-DEV**

**Duration: 3 days**

## Overview

## Course Description

In this three-day, hands-on Developer training course, you will learn how to build an application that can publish data to, and subscribe to data from, an Apache Kafka® cluster. You will learn the role of Kafka in the modern data distribution pipeline, Kafka architectural concepts and components, and review Kafka developer APIs.

## Skills Gained

In this hands-on course, you will:

- Write Producers and Consumers to send data to and read data from Kafka
- Integrate Kafka with external systems using Kafka Connect
- Write streaming applications with Kafka Streams & ksqlDB
- Integrate a Kafka client application with Confluent Cloud

## Who Can Benefit

Application developers and architects who want to write applications that interact with Apache Kafka®. The course treats Java as a first-class citizen, but students will derive value even if Java is not their primary programming language. Python, C# and NodeJS clients will also be used.

## Prerequisites

Attendees should be familiar with developing professional apps in Java (preferred), C#, or Python. Additionally, a working knowledge of the Apache Kafka architecture is required for this course, either through:

## Hands-on Training:

The hands-on lab exercises in the course follow the coherent story of building and upgrading a driver location app. This gives a throughline throughout the course where concepts are applied directly to a working application. Exercises are available in Java, C# and Python.

Exercises include:

- Working with Kafka command line tools
- Producing driver location data to Kafka and consuming that data in real-time
- Refactoring the application to use Avro and Schema Registry
- Creating a Kafka Streams application to do real-time distance aggregation
- Extracting a table from an external database into Kafka using Kafka Connect
- Creating a full event streaming application using ksqlDB that enriches driver location data with driver profile data
- Experimenting with semantic partitioning

## Audience

## Course Details

## Course Outline

Fundamentals of Apache Kafka

- Explain the value of a \*Distributed Event Streaming Platform\*
- Explain how the “log” abstraction enables a distributed event streaming platform
- Brokers, Topics, Partitions, and Segments
- Records (a.k.a. Messages, Events)
- Retention Policies
- Producers, Consumers, and Serialization

- Replication
- Kafka Connect

## Producing Messages to Kafka

- Sketch the high level architecture of a Kafka producer
- Illustrate key-based partitioning
- Explain the difference between `acks=0`, `acks=1`, and `acks=all`
- Configure `delivery.timeout.ms` to control retry behavior
- Create a custom `producer.properties` file
- Tune throughput and latency using batching
- Create a producer with Confluent REST Proxy

## Consuming Messages from Kafka

- Illustrate how consumer groups and partitions provide scalability and fault tolerance
- Tune consumers to avoid excessive rebalances
- Explain the difference between “range” and “round robin” partition assignment strategies
- Create a custom `consumer.properties` file
- Use the Consumer API to manage offsets
- Tune fetch requests
- Create a consumer with Confluent REST Proxy

## Schema Management in Apache Kafka

- Explain what Avro is
- Write Avro messages to Kafka
- Use the Confluent Schema Registry to guide schema evolution

## Stream Processing with Kafka Streams

- Compare KStreams to KTables
- Create a Custom `streams.properties` file
- Explain what co-partitioning is and why it is important
- Write an application using the Streams DSL (Domain-Specific Language)

## Data Pipelines with Kafka Connect

- Explain the motivation for Kafka Connect

- List commonly used Connectors
  - Explain the differences between standalone and distributed mode
  - Configure and use Kafka Connect
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### Event Streaming Apps with ksqlDB

- Use ksqlDB to filter and transform a stream
- Write a ksqlDB query that joins two streams or a stream and a table
- Write a ksqlDB query that aggregates values per key and time window
- Write Push and Pull queries and explain the differences between them
- Create a Connector with ksqlDB

### Design Decisions

- List ways to avoid large message sizes
- Decide when to use ksqlDB vs. Kafka Streams vs. Kafka Connect SMTs
- Explain differences and tradeoffs between processing guarantees
- Address decisions that arise from key-based partitioning
- Authenticate a client app with a secure Kafka cluster

### Confluent Cloud

- Explain what “fully-managed” means in the context of Confluent Cloud
- Authenticate a Kafka client to Confluent Cloud
- Do basic operations with the `ccloud` CLI

## Related Certifications

Authorized training from Ascendient is created and maintained by the vendor who also creates the certification exams. While it may not be a requirement of certification to attend a vendor-authorized training class, doing so will put you in the best position to successfully complete the related exams. Start training and begin working towards one of the following certifications today.

#### Certifications

Confluent Certified Developer for Apache Kafka

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