Confluent Certified Administrator for Apache Kafka

Duration: 5 Days (8 Hrs/Day)

Prerequisites: Basic knowledge of Computers

Course Objective: Unlock the expertise needed for a Confluent Certified Administrator in Apache Kafka. From mastering Kafka fundamentals to effectively managing, configuring, and optimising clusters for peak performance. Dive into Kafka Security, and gain insights into designing, troubleshooting, and seamlessly integrating systems. This course empowers you to excel as a certified Kafka administrator.

Lab Requirement: Koenig-DC (CentOS 9) and Participant Confluent Cloud Account Required

Module 1 - Kafka fundamentals

Apache Kafka architecture, design principles, and purposes

Distributed Systems - Scalability, Fault Tolerance, High Availability

Primary functions of: Producer, Consumer, Broker

Meaning of "immutable" log

Meaning of "committed"

Topics, Partitions

Essential services of Apache Zookeeper

Replication, Leaders, Followers

Kafka Messages, structure, make-up, metadata

Kafka Controller

Exactly Once Semantics

Lab: Signing up for Confluent account

Lab: Create a Kafka cluster with default configuration

Lab: Create a Kafka topic with default configuration

Lab: Create a Kafka producer and consumer and start producing and consuming messages.

Module 2 - Managing, configuring, and optimising a cluster for performance

Startup sequence; component dependencies

How many partitions? Tradeoffs

Scalability factors

Sources and tools for monitoring; Display of metrics

InSyncReplicas (ISR); Fully and Under replicated, and offline

Consumer lag, Under/Over Consumption

Broker failure, detection, and recovery

Batching and its impacts/consequences

Determining and solving data imbalance across brokers

Impacts of average and maximum message sizes

Quotas

Lab: How to scale a topic

Lab: How to add or remove partitions inside a topic

Lab: How to improve producer's and consumer's performance

Lab: How to modify InSyncReplicas (ISR)

Lab: How to modify default configuration for a topic

Lab: How to manage quota

Lab: How to use metric API

Lab: How to identify consumer lag

Lab: How to change message compression type

Lab: How to send message with/without keys

Lab: How to add timestamp for a message manually

Module 3 - Kafka Security

Authentication and Authorisation (meanings and methods)

In-flight encryption - where and how

At rest encryption - strategies

SSL/TLS key stores and trust stores

Authentication and Authorisation troubleshooting

Access Control Lists (ACLs) - where and how used o Use of wildcards

Lab: How to configure Authentication and Authorisation method

Lab: How to configure ACLs

Lab: How to generate key stores and trust stores

Lab: How to configure in-flight encryption

Module 4 - Designing, troubleshooting, and integrating systems

Brokers and Zookeeper o CPU, RAM, network, storage considerations o Number of nodes

Rack awareness

Kafka Connect o Source and Sink Connectors o Scalability and High Availability

Business Continuity / DR

Data retention

Lab: How to optimise CPU overhead

Lab: How to optimise network overhead

Lab: How to optimise storage

Lab: How to use Kafka Connect