COURSE CONTENTS

VINSYS

Course Agenda – Kafka Development

Duration – 4 days

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Adding Value

www.vinsys.in

Duration: 4 Days

Pre-Requisites:

- Basic knowledge of Java/Python programming language
- Basic knowledge of SQL

Course Objectives:

- After completion of the course, candidate can be able –
  - To install the required software & related tools.
  - To understands how messaging system works.
  - To write the producer & consumer applications.
  - To setup Single and Multi-node clusters.
  - To monitor Kafka health using different tools.
  - To connect with different sources & sinks using Kafka-connect.
  - To write the streaming applications.
  - To handle real time projects with some preparation.

Certification Link:

- https://www.confluent.io/certification/

Course Outline:

Day 1:
Introduction to Apache Kafka

- Need for Kafka.
- What is Kafka?
- Kafka Features
- Kafka Concepts
- Kafka Architecture
- Kafka Components
- Zookeeper
- Where is Kafka Used?
- Kafka Installation
- Kafka Cluster
- Types of Kafka Clusters
- Configuring Single Node Single Broker Cluster
- **Hands on:**
  - Kafka Installation
  - Set up and working with Single Node-Single Broker Cluster
  - Set up and working with Single Node Multi Broker Cluster

Kafka Producer

- Configuring Single Node Multi Broker Cluster
- Constructing a Kafka Producer
- Sending a Message to Kafka
- Producing Keyed and Non-Keyed Messages
- Sending a Message Synchronously & Asynchronously
- Configuring Producers
- Serializers
- Serializing Using Apache Avro
- Partitions

- **Hands On:**
  - Creating a Kafka Producer
  - Configuring a Kafka Producer
  - Sending a Message Synchronously & Asynchronously

Day 2:
Kafka Consumer

- Consumers and Consumer Groups
- Standalone Consumer
- Consumer Groups and Partition Rebalance
- Creating a Kafka Consumer
- Subscribing to Topics
- The Poll Loop
- Configuring Consumers
- Commits and Offsets
- Rebalance Listeners
- Consuming Records with Specific Offsets
- Deserializers
- **Hands On:**
  - Creating a Kafka Consumer
  - Configuring a Kafka Consumer
  - Working with Offsets

Day 3:
Kafka Internals

- Cluster Membership
- The Controller
- Replication
- Request Processing
- Physical Storage
- Reliability
- Broker Configuration
- Using Producers in a Reliable System
- Using Consumers in a Reliable System
- Validating System Reliability
- Performance Tuning in Kafka
- **Hands On:**
  - Create topic with partition & replication factor 3 and execute it on multi-broker cluster
  - Show fault tolerance by shutting down 1 Broker and serving its partition from another broker.

Kafka Monitoring and Kafka Connect

- Considerations When Building Data Pipelines
- Metric Basics
- Kafka Broker Metrics
- Client Monitoring
- Lag Monitoring
- End-to-End Monitoring
- Kafka Connect
- When to Use Kafka Connect?
- Working few famous connectors.
- Kafka Connect Properties

- **Hands on:**
  - Kafka Connect

Day 4:

Kafka Stream Processing

- Stream Processing
- Stream-Processing Concepts
- Stream-Processing Design Patterns
- Kafka Streams by Example
- Kafka Streams: Architecture Overview
- **Hands on:**
  - Kafka Stateful and Stateless streaming

Kafka Structured Streaming

- Confluent – KSQL
- Structured Streaming – KStreams, KTables
- KSQL Joins
- Window Operations
  - Hopping Window
  - Tumbling Window
  - Session Window
- **Hands on:**
  - KSQL – KStreams and KTables

Spark & Kafka Integration

- Integration of Spark with Kafka