

Apache Kafka Course Contents (4 days)

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Introduction to Big Data and Kafka

- Introduction to Big Data
- Big Data Analytics
- 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

Hands-on:

- Kafka Installation
- Implementing Single Node-Single Broker Cluster

Kafka Producer

- Configuring Single Node Single Broker Cluster
- 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:

- Working with Single Node Multi Broker Cluster
- Creating a Kafka Producer
- Configuring a Kafka Producer
- Sending a Message Synchronously & Asynchronously

Kafka Consumer

Topics:

- 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

Kafka Operations and Performance Tuning

- 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 a 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 Cluster Architectures and Administering Kafka

- Multi-Cluster Architectures
- Apache Kafka's MirrorMaker
- Other Cross-Cluster Mirroring Solutions
- Topic Operations
- Consumer Groups
- Dynamic Configuration Changes
- Partition Management
- Consuming and Producing
- Unsafe Operations

Hands-on:

- Topic Operations
- Consumer Group Operations
- Partition Operations
- Consumer and Producer Operations

Kafka Stream Processing

- Stream Processing
- Stream-Processing Concepts
- Stream-Processing Design Patterns
- Kafka Streams by Example
- Kafka Streams: Architecture Overview

Hands-on:

- Kafka Streams
- Word Count Stream Processing

Integration of Kafka with Hadoop, Storm and Spark

- Apache Hadoop Basics
- Hadoop Configuration
- Kafka Integration with Hadoop

- Apache Storm Basics
- Configuration of Storm
- Integration of Kafka with Storm
- Apache Spark Basics
- Spark Configuration
- Kafka Integration with Spark

Hands-on:

- Kafka integration with Hadoop
- Kafka integration with Storm
- Kafka integration with Spark