KAFKA

COURSE CURRICULUM

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+91 630 171 9270

Kafka Course Curriculum

Pre-requisites

- Basic knowledge of Core Java Programming
- Database Concepts
- Unix/Linux

Module 1: Introduction to Big Data and Kafka

Learning Objectives: Understand where Kafka fits in the Big Data space, Kafka Architecture, Cluster configuration.

- 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

Module 2: Kafka Producer

Learning Objectives: Construct Kafka Producer, send messages (Sync/Async), serialize using Avro, use partitions.

- Configuring Single Node – Multi Broker Cluster
- Constructing a Kafka Producer
- Sending a Message to Kafka
- Producing Keyed and Non-Keyed Messages
- Synchronous & Asynchronous Messaging
- Configuring Producers
- Serializers
- Apache Avro Serialization
- Partitions

Hands-on:

- Working with Single Node – Multi Broker Cluster
- Creating & Configuring Kafka Producer
- Sending Messages (Sync/Async)

Module 3: Kafka Consumer

Learning Objectives: Construct Kafka Consumers, subscribe to topics, manage offsets.

- 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 & Configuring Kafka Consumer
- Working with Offsets

Module 4: Kafka Operations and Performance Tuning

Learning Objectives: Tune Kafka for high performance and reliability.

- Cluster Membership
- The Controller
- Replication
- Request Processing
- Physical Storage
- Reliability
- Broker Configuration
- Reliable Producers and Consumers
- System Reliability Validation
- Performance Tuning in Kafka

Hands-on:

- Create Topic with Partition & Replication Factor 3
- Fault Tolerance – Broker Shutdown Test

Module 5: Kafka Cluster Architecture & Administration

Learning Objectives: Learn Kafka Multi-Cluster setups, Topic/Partition operations, and ZooKeeper coordination.

- 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

Module 6: Kafka Stream Processing

Learning Objectives: Use Kafka Streams API to build real-time applications.

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

Hands-on:

- Kafka Streams – Word Count Stream Processing

Module 7: Kafka Integration with Hadoop, Storm, and Spark

Learning Objectives: Learn integration of Kafka with Hadoop ecosystem and real-time processing engines.

- Apache Hadoop Basics
- Hadoop Configuration
- Kafka + Hadoop Integration
- Apache Storm Basics
- Storm Configuration
- Kafka + Storm Integration
- Apache Spark Basics
- Spark Configuration
- Kafka + Spark Integration

Hands-on:

- Kafka Integration with Hadoop
- Kafka Integration with Storm
- Kafka Integration with Spark

Thank you

Thank You for Going Through Kafka Curriculum
We hope this guide has provided a clear and structured learning path to strengthen your skills in Kafka.

📌 **NEXT STEPS**

- Start practicing with real-world use cases and hands-on exercises
- Build personal or client-based projects for your portfolio
- Keep exploring updates and best practices in the industry
- Join discussions and stay connected with the community

📞 Need Help or Guidance?

Feel free to contact our course support team:

Course Coordinator

GS Infotekh

📧 contact@gsinfotekh.com

🌐 www.gsinfotekh.com

📞 +91 630 171 9270