**Kafka Streams with Microservices-Advance**

**Course Content**

**Training Duration- 5 Days**

**\*\*\*\*\*Every Day Two Module will be covered. Module 1 before Break and Module 2 After Lunch Break.**

**\*\*\*All Module is having Practical Expects.**

**Pre-Requisite::: All Participant’s Must have exposure of SQL and HIVE and spark sql**

**Day1:::**

**Module 1:::**

* Introduction of Big Data
* Need for Distributed Computing and Storage
* Introducing to Messaging Systems and their use cases, Problems and limitations (P2P, PubSub)
* Understand publish-subscribe messaging and how it fits in the big data ecosystem.
* Kafka Theory
* Topics, Partitions and Offsets
* Brokers and Topics
* Topic Replication
* Producers and Message Keys
* Consumers & Consumer Groups
* Consumer Offsets & Delivery Semantics
* Kafka Broker Discovery
* Zookeeper
* Kafka Guarantees
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* Starting Kafka
* CLI (Command Line Interface)
* CLI Introduction
* Kafka Topics CLI
* Kafka Console Producer CLI
* Kafka Console Consumer CLI
* Kafka Consumers in Group
* Kafka Consumer Groups CLI
* Resetting Offsets
* CLI Options that are good to know
* Kafka for Big Data & Data Ingestion, Role in ETL
* Why do we need Kafka? Components of Kafka -¬
* Broker, Producer, Consumer, Topic, Partition
* Kafka use cases

**Day 2:::**

**Module 1:::**

* Conception of Event Streams
* Real-time Streaming - Use Cases
* Real-time Streaming Challenges
* Real-time Streaming Design Consideration
* What is Apache Kafka?
* Kafka Cluster Architecture
* Kafka Work Distribution Architecture
* Streaming into Kafka
* Kafka Producers - Quick Start
* Kafka Producer Internals
* Scaling Kafka Producer
* Advanced Kafka Producers (Exactly Once)
* Advanced Kafka Producer (Implementing Transaction)
* Kafka Producer - Micro Project

**Day 3:::**

**Module 1:::**

* Stream Processing in Apache Kafka
* Kafka Consumer - Practical Introduction
* Kafka Consumer - Scalability, Fault tolerance and Missing Features
* Creating Streams Topology
* Implementing Streams Topology
* Kafka Streams Architecture
* Introduction to Types and Serialization in Kafka
* JSON Schema to POJO for JSON Serdes
* Creating and Using JSON Serdes
* AVRO Schema to POJO for AVRO Serdes
* Creating and using AVRO schema in Producers
* Creating and using AVRO schema in Kafka Streams
* Understanding States and State Stores
* Creating your First State Store
* Caution with States
* State Store Fault Tolerance

**Day 4:::**

**Module 1:::**

* Introducing KTable
* Creating your First Update Stream - KTable
* Table Caching and Emit Rates
* Introducing GlobalKTable
* Computing Your First Aggregate - Real-time Streaming Word Count
* Streaming Aggregates - Core Concept
* KStream Aggregation using Reduce()
* KStream Aggregation using Aggregate()
* Common Mistakes in Aggregation
* Count on KTable
* KTable Aggregation using Aggregate()
* Timestamps and Timestamp Extractors
* Creating Tumbling Windows
* Stream Time and Grace Period
* Supressing Intermediate Results
* Creating Hopping Windows
* Creating Session Windows

**Day 5:::**

**Module 1:::**

* Streaming Joins
* Joining a KStrem to another KStream
* Joining a KTable to another KTable
* Joining a KStream to a KTable and GlobalKTable
* Mixing Joins with Aggregates - Computing Top 3
* Mixing Joins with Aggregates - Advert CTR
* Introducing Micro-services Requirement
* Understanding Local Vs Remote State Store
* Implementing Interactive Query Micro-service