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Kafka + Springboot Bootcamp — From Zero to Production

Arvind Kumar Following 4 min read · Oct 29, 2025

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> ***Duration:*** *15 Days (1 hour/day)*
>
> ***Focus:*** *Kafka Core + Spring Boot Integration + Real Production System*
>
> ***Target Audience:*** *Developers new to Kafka but familiar with Java & Spring Boot*

Apache Kafka isn't just a message broker — it's the **nervous system of modern distributed systems.**
From event-driven microservices to real-time analytics, Kafka sits at the center of systems that move data *continuously* instead of *occasionally*.

This **15-day Kafka Bootcamp** is designed to take a Java/Spring Boot developer from *zero* to *production-grade* Kafka integration — understanding the

internals, building fault-tolerant producers and consumers, handling retries, ensuring exactly-once delivery, and even understandoing the Kafka deployed to Cloud.

> *Full story for non-members* | *Grab My Microservices E-Book* | *Youtube* | *LinkedIn* | *Book a 1:1 Meeting*

Each day, we'll invest just **1 focused hour** — combining theory, guided demos, and hands-on mini assignments — to build up a solid Kafka-based system step by step.

Day 1: The World of Event Streaming

- Why Kafka? Evolution from message queues to event logs.

- Core concepts: topics, partitions, brokers, producers, consumers.
- Kafka architecture overview (ISR, leader-follower replication).

> Hands-on: *Set up Kafka locally (using Docker or other way)and create your first topic.*

Day 2: CLI Practice and Deep Dive into Kafka Internals. Kafdrop for kafka monitoring

- Using `kafka-topics.sh`, `kafka-console-producer`, and `kafka-console-consumer`.
- Exploring topic metadata, partition leaders, and offsets.
- Understanding message durability and replication.
- Install Kafdrop for Kafka monitoring

> Hands-on: *Produce and consume messages using CLI; simulate broker failure. Kafka monitoring with kafdrop*

Day 3: Spring Boot Integration — Producer Setup

- Setting up Kafka dependencies in Spring Boot.
- Producer configs: serializers, acks, retries, batching.
- Writing your first producer and publishing events programmatically.

> Hands-on: *Send* `OrderPlacedEvent` *using REST endpoint.*

Day 4: Spring Boot Integration — Consumer Setup

- Consumer groups and rebalancing explained.

- Deserialization and concurrent consumers.
- Manual vs auto offset commits.

> Hands-on: *Build an OrderConsumer that logs and persists data.*

Day 5: Error Handling + Retries + Dead Letter Topics

- Common failure patterns (serialization, transient errors, poison pills).
- Spring Kafka's `@RetryableTopic` and DLT setup.
- Logging and tracing failed messages.

> Hands-on: *Create a retry + DLT pipeline and verify with test messages.*

Day 6: Message Ordering and Keying Strategies

- Partitioning logic and message ordering guarantees.
- How keys influence message placement.
- Handling reordering in consumers.

> Hands-on: *Experiment with keyed vs keyless messages.*

Day 7: Idempotency, Transactions, and Exactly Once

- Producer idempotence (`enable.idempotence=true`).
- Kafka transactions and atomic writes to multiple topics.
- Exactly-once semantics — myth vs reality.

> Hands-on: *Build a payment processor with transactional producer.*

Day 8: Building Resilient Event-Driven Systems

- Event delivery patterns: fire-and-forget, synchronous, and async acknowledgment.
- Designing event contracts and versioning strategies.
- Real-world pitfalls: duplicate messages, network retries, and lag.

> Hands-on: *Add logging and validation layers around events.*

Day 9: Outbox Pattern

- Problem: dual writes and data consistency.
- Outbox table design, transactional publishing, and Debezium overview.
- Implementing the outbox pattern with Spring Boot + Kafka.

> Hands-on: *Implement outbox publisher for Order Service.*

Day 10: Saga Pattern and Event Choreography

- Coordinating distributed transactions with Kafka events.
- Saga orchestrator vs choreography models.
- Example: Order → Payment → Inventory → Notification.

> Hands-on: *Implement event-based Saga flow.*

Day 11: Kafka Streams Fundamentals

- Stream processing vs message consumption.
- Stateless transformations (`map`, `filter`, `branch`).

- Writing a Kafka Streams app inside Spring Boot.

> Hands-on: *Build order event transformer service.*

Day 12: Kafka Streams — Stateful Operations

- Aggregations, joins, and windowed computations.
- Understanding state stores and RocksDB.
- Reprocessing and materialized views.

> Hands-on: *Count orders per minute and expose via REST.*

Day 13: Schema Registry + Avro + Versioning

- Why schemas matter in event-driven systems.
- Using Confluent Schema Registry.
- Avro serialization and compatibility rules (backward, forward).

> Hands-on: *Produce and consume Avro messages.*

Day 14: Integration Testing with Embedded Kafka

- Unit testing producers and consumers.
- Integration testing with `@EmbeddedKafka`.
- Testcontainers for Kafka end-to-end flow.

> Hands-on: *Write integration tests for event pipeline.*

Day 15: Monitoring, Lag Metrics, and Cloud Deployment

- Understanding consumer lag and offsets.
- Kafka metrics via Micrometer and Actuator.
- Understanding Kafka available on AWS (known as MSK) and Confluent Cloud.
- Production tuning tips (acks, linger.ms, batch.size).

> Hands-on: *Deploy and verify your system's metrics dashboard.*

Final Project

Goal: Build a mini "Order Management System" consisting of:

- **Order Service** → produces events
- **Payment Service** → consumes + produces
- **Inventory Service** → consumes + updates stock
- Add retry/DLT handling, transaction safety, and test coverage.

Closing Note

By the end of this 15-day bootcamp, you won't just "know Kafka" —
You will understand *why* Kafka behaves the way it does under load, during failures, and across distributed systems.

They'll be able to:

- Build reliable producers and consumers in Spring Boot.

- Handle retries, DLTs, and transactional events with confidence.
- Test and monitor Kafka pipelines like a production engineer.
- Deploy and operate Kafka apps on cloud environments such as MSK or Confluent Cloud.

> *Need my help to do this bootcamp? Drop message on linkedin*

This lays the perfect foundation for **Part 2: Advanced Kafka Master class**, where we'll dive into **Kafka Connect, Schema Evolution, Performance Tuning, Multi-Cluster Replication, and Real-Time Analytics Pipelines** — the topics that turn an engineer into an architect.

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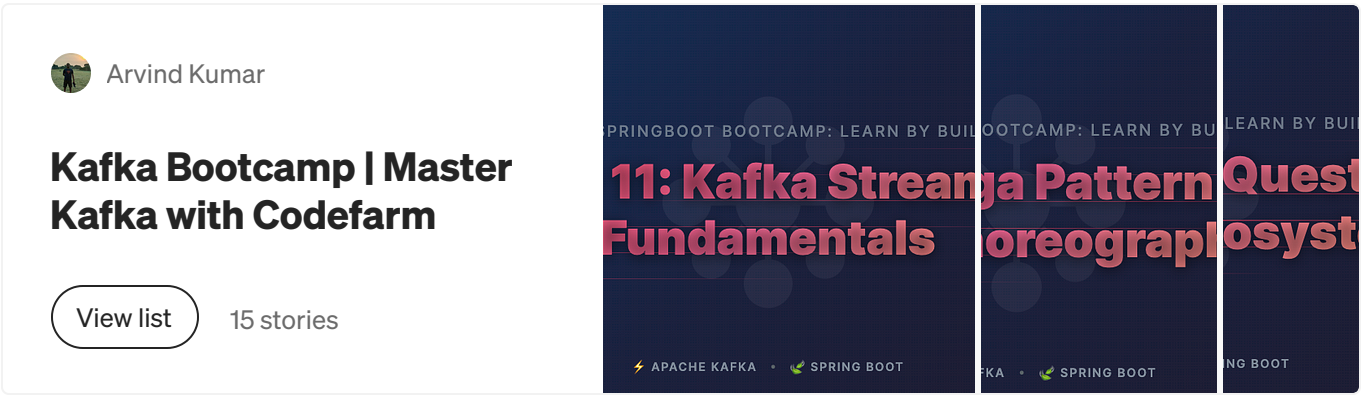

Kafka | Apache Kafka | Kafka Producer | Kafka Streams | Kafka Connect

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Pradeep Kasula

What are your thoughts?

Enamoradoc
Oct 29, 2025 (edited)

Awesome, glad you're doing this!

7 1 reply Reply

Engouyassa
Nov 11, 2025

Great undertaking. How is this bootcamp accessible?

4 1 reply Reply

mohamad shahkhajeh
Nov 2, 2025

Have you considered how partitioning strategy might impact exactly-once delivery and consumer lag under load?

6 Reply

See all responses

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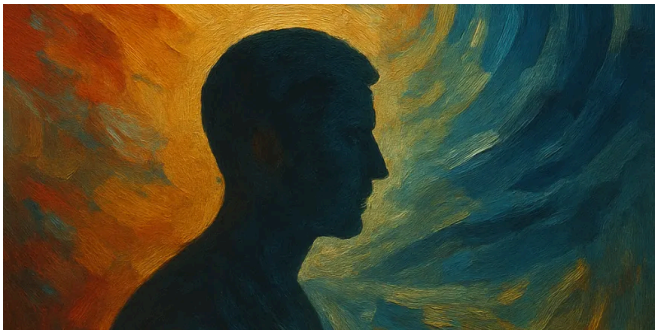

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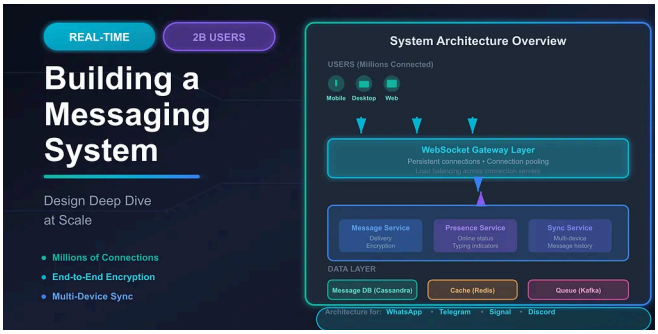

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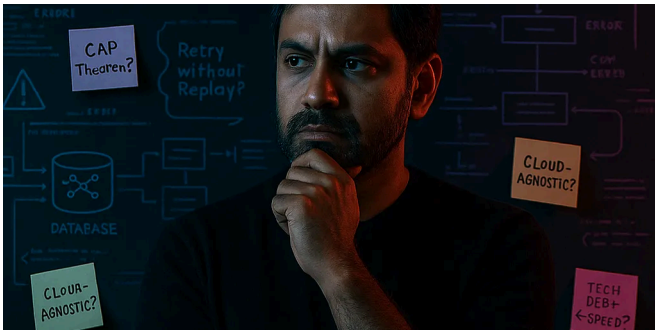

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Outbox Pattern- Day 9

Welcome to the Outbox Pattern!

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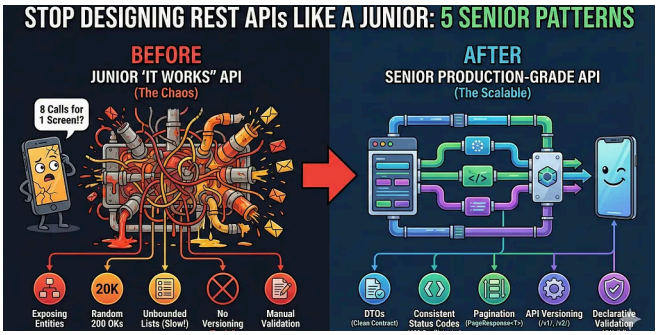

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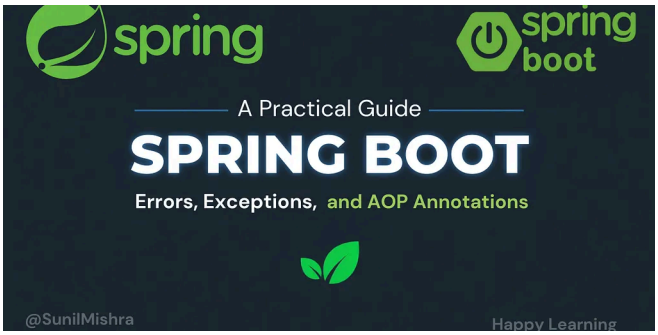

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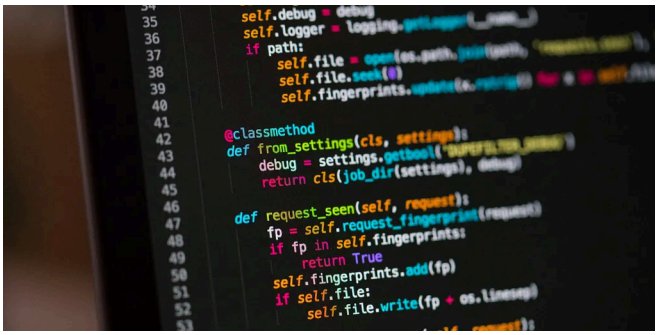

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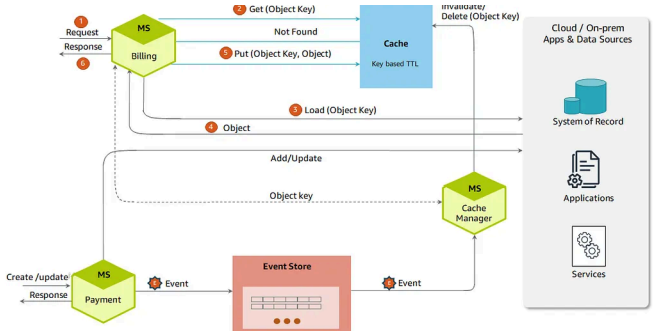

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