# Build scalable applications with Apache Kafka

**Section 1: Apache Kafka Architecture**

**1.1 The Course Overview**

This video provides an overview of the entire course.

**1.2 Building Applications in the Publish-Subscribe Architecture**

What is the need for Publish-Subscribe Architecture?

* Understand how Kafka tackles these problems
* Learn how Kafka is used in the Streaming World

**1.3 Topics and Partitions**

What are Topics and Partitions?

* Learn how to scale Kafka Topics
* Understand what is an topic offset
* Learn how offsets are stored per consumer group

**1.4 How Kafka Cluster is Built? - Brokers**

What is a Kafka Broker?

* Learn how Topic Partitions are Replicated between Brokers
* Understand what is the leader of Partitions

**1.5 Setup of Kafka - Using Docker**

How to setup Kafka using Docker?

* Install Zookeeper
* Install Kafka
* Use Docker to setup Kafka Locally

**Section 2: Producers and Consumers**

**2.1 Sending Events to Kafka - Producers API**

How to send events to Kafka?

* Configure the Kafka Producer
* Configure the Producer API
* Send Events in a Synchronous Way

**2.2 Asynchronous Send**

What is asynchronous send?

* Learn about Producers API – Async Send
* Investigate Record Metadata
* Write tests for Kafka producer

**2.3 Partitioning of Topics - Implementing Custom Partitioner**

What is partitioning of topics and how to implement custom partitioner?

* Use Key of Record to Partition Data in Kafka
* Configure Number of Partitions for specific topic
* Implement Custom Partitioner

**2.4 Reading Events from Kafka - Consumer API**

How to read events from Kafka using Consumer API?

* Learn about Consumer API
* Configure and Create Kafka Consumer
* Implement consuming of messages

**2.5 Consumer Pool Loop - Offset Management**

How to implement Consumer Pool Loop with committing offset?

* Commit offset synchronously
* Commit offset async
* Test Kafka Consumer

**2.6 Rebalancing of Consumers**

What is Kafka rebalance?

* Implement Rebalance Listener
* Handle Offsets properly while rebalance

**Section 3: Advanced Kafka - Understanding Internals**

**3.1 Electing Partition Leaders - Kafka Controller Component**

How does Kafka elect Leaders for Partition?

* Learn what is Controller component
* Learn about brokers Advanced Topics

**3.2 Data Replication in Kafka**

How are Topics and Partitions replicated?

* Learn how many replicas we should have
* Understand how the number of replicas affect Kafka

**3.3 Append-Only Distributed Log - Storing Events in Kafka**

What is append-only Distributed log and what is the structure of storing events in Kafka?

* Learn why Scaling Kafka to multiple consumers and producers is so easy
* Understand why one partition can be read by only one consumer because Kafka is storing offset per partition
* Read topics from multiple consumer groups

**3.4 Compaction Process**

What is Kafka Compaction?

* Learn how Compaction is performed
* Understand how Compaction differ from Delete

**3.5 Summary of Apache Kafka Course**

Summarize what was covered in the entire course.

* We learned about Kafka Architecture
* We learned about Producer and Consumer API
* We learned about Kafka Internals