

# Red Hat Certified Specialist in Event-Driven Development with Kafka Exam (EX482)

ID EX482 Price CHF 557.—(excl. VAT) Duration 1 day

## Who should attend

The following audiences may be interested in earning the Red Hat Certified Specialist in Event-Driven Development with Kafka credential:

- Java developers and architects who are implementing event-driven applications using Apache Kafka and Kubernetes.
- Red Hat Certified professionals who wish to pursue Red Hat Certified Architect (RHCA) certification.

## Prerequisites

- Familiarity with using VSCode/VSCodium in a Red Hat Enterprise Linux environment.
- Good experience with Java SE, including a knowledge and understanding of the core Java concepts and APIs. For example, exceptions, annotations, lambdas, and familiarity with functional programming and the Collections API are all required.
- Some familiarity with OpenShift/Kubernetes is beneficial.

Red Hat recommends that candidates for this exam earn Red Hat Certified Cloud-Native Developer (EX378) before attempting this exam, but it is not required.

## Course Content

### Study points for the exam

As part of this exam, you should be able to perform these tasks:

#### Understand and work with event-driven applications with AMQ Streams API.

- Know how to send and read data from Kafka.
- Be able to develop microservices and other types of applications to share data with extremely high throughput and low latency.

#### Understand the Kafka ecosystem and architecture:

- How to create, configure, and manage topics.
- How to configure the ecosystem to share data with extremely high throughput and low latency.
- How to scale and guarantee message ordering.
- Message compaction to remove old records, and how to set them.
- Configuration and use of the replication of data to control fault tolerance.
- Retention of high volumes of data for immediate access.

#### Understand and work with a Quarkus application connected to Kafka

- Connect to Kafka with Reactive Messaging
- Connect to Apache Kafka with its native API
- Produce and consume messages and implement event-driven and data-streaming applications
- Be familiar with the reactive libraries used by Quarkus : Asynchronous Java or Publisher API, RxJava or Reactor APIs, Mutiny, etc.

#### Provide and configure access to a Kafka cluster.

- Be able to access the external listeners of Kafka on the cloud. In the cases of Kubernetes or Red Hat OpenShift, connect via node ports, load balancers, and externally, using an ingress or OpenShift route.
- Understand how to configure the security of the communications between the Kafka client and the cluster.
- Produce and consume messages and implement event-driven and data-streaming applications
- Understand and provide the Kafka client configuration for the required authentication and authorization security.

#### Provide and use the schema Red Hat Service Registry to decouple the data from client applications, share and manage the data types at runtime:

- Understand and work with the different Kafka Streams APIs like Streams DSL and Processor API.
- Configure and provide the proper Kafka SerDes (Serializer/Deserializer) for the records to correctly materialize the data
- Be able to receive data from one or more input streams,

execute complex operations like mapping, filtering or joining, repartition and/or grouping, and write the results into one or more output streams.

- Understand the stream-table duality and perform stateful operations like joins, aggregations, and windowed joins.
- Understand how to define and connect custom processors and transformers to interact with state stores using the Processor API.
- Understand the event manipulation deriving new collections from existing ones and describing changes between them.

### **Data integration with Kafka Connect:**

- Understand how Kafka Connect provides reliability and scalability data transferring between Kafka and other heterogeneous data systems.
- Understand how Kafka Connect facilitates data conversion, transformation, and offset management.
- Apply the detecting and capturing data changes (CDC) with Debezium.
- Understand the different stand-alone/distributed running modes and their use cases.
- Use the pre-built AMQ Streams connectors.

### **Understand and use advanced event-driven patterns in applications based on Apache Kafka:**

- Recognize and work in an application with Event Sourcing and CQRS patterns
- Know and work in advanced techniques like long-running business transactions with Saga orchestration and outbox patterns to exchange data between different services.

### **Troubleshoot most common problems in event-driven applications like maintaining message ordering, retries and idempotency, handling duplicate events, implement Streams test cases**

- During the exam you may be required to work with one or more pre-written Java applications. You will be required to modify some parts of the application code.

As with all Red Hat performance-based exams, configurations must persist after reboot without intervention.

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