

# Kafka KRaft Mode

Apache Kafka without Zookeeper

The Kafka project undertook one of its greatest change with the introduction of [KIP-500](#) on August 1st 2019: the desire to remove Zookeeper as a dependency to running Apache Kafka.

## Why remove Zookeeper from Kafka?

Kafka scaling has hit a performance bottleneck with Zookeeper, which means Kafka has the following limitations with Zookeeper:

Kafka clusters only support a limited number of partitions (up to 200,000)

When a Kafka broker joins or leaves a cluster, a high number of leader election must happen which can overload Zookeeper and slow down the cluster temporarily

Kafka clusters setup is difficult and depends on another component to setup

Kafka cluster metadata is sometimes out-of-sync from Zookeeper

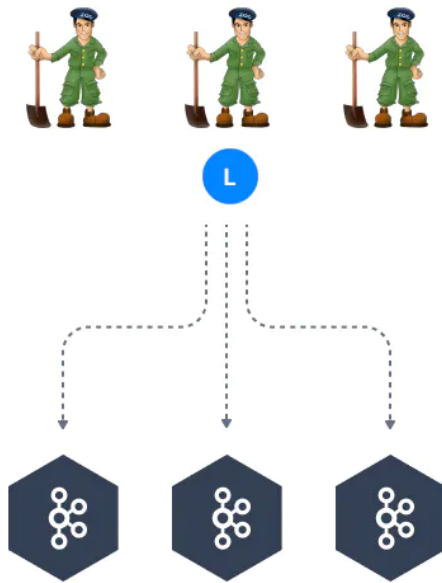
Zookeeper security is lagging behind Kafka security

## Kafka KRaft Mode

It has been noted as part of KIP-500 that the metadata of Kafka itself is a log and that Kafka brokers should be able to consume that metadata log as an internal metadata topic. Kafka leverages itself!

Removing Zookeeper means that Kafka must still act as a quorum to perform controller election and therefore the Kafka brokers implement the [Raft protocol](#) thus giving the name KRaft to the new Kafka Metadata Quorum mode.

### With Zookeeper



### With Quorum Controller



**L** Quorum leader

Without Zookeeper, the following benefits are observed in Kafka:

Ability to scale to millions of partitions, easier to maintain and set up

Improved stability, easier to monitor, support, and administer

Single process to start Kafka

Single security model for the whole system

Faster controller shutdown and recovery time

## More Kafka KRaft reading

Kafka KRaft was officially released as of Kafka version 3.3 and is now production ready. Read more on the [change here](#).

A starting tutorial is included on this site for [Windows](#), [Mac](#) and [Linux](#).

A good blog on the [Confluent blog](#) describes the benefits of KRaft.

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