

# KAFKA Understanding

Dr. A. Suresh, INSOFE

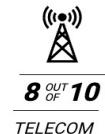
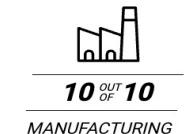
# Introduction

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## APACHE KAFKA

*More than 80% of all Fortune 100 companies trust, and use Kafka.*

Apache Kafka is an open-source distributed event streaming platform used by thousands of companies for high-performance data pipelines, streaming analytics, data integration, and mission-critical applications.

[SEE FULL LIST](#)

**10/10** Largest insurance companies

**10/10** Largest manufacturing companies

**10/10** Largest information technology and services companies

**8/10** Largest telecommunications companies

**8/10** Largest transportation companies

**7/10** Largest utility companies

# APACHE KAFKA

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- An open-source distributed streaming message platform developed at LinkedIn.
- Written in Java and Scala.
- Support for several clients - C++, Python, Ruby, Go, .NET, Node.js, etc..
- Mainly used for,
  - Real-time data pipelines
  - Real-time streaming applications
- Used at - LinkedIn, Netflix, Twitter, Apple, etc..

# Introduction



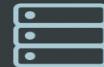
## HIGH THROUGHPUT

Deliver messages at network limited throughput using a cluster of machines with latencies as low as 2ms.



## SCALABLE

Scale production clusters up to a thousand brokers, trillions of messages per day, petabytes of data, hundreds of thousands of partitions. Elastically expand and contract storage and processing.



## PERMANENT STORAGE

Store streams of data safely in a distributed, durable, fault-tolerant cluster.



## HIGH AVAILABILITY

Stretch clusters efficiently over availability zones or connect separate clusters across geographic regions.

## ECOSYSTEM



### BUILT-IN STREAM PROCESSING

Process streams of events with joins, aggregations, filters, transformations, and more, using event-time and exactly-once processing.



### CONNECT TO ALMOST ANYTHING

Kafka's out-of-the-box Connect interface integrates with hundreds of event sources and event sinks including Postgres, JMS, Elasticsearch, AWS S3, and more.



### CLIENT LIBRARIES

Read, write, and process streams of events in a vast array of programming languages.



### LARGE ECOSYSTEM OPEN SOURCE TOOLS

Large ecosystem of open source tools: Leverage a vast array of community-driven tooling.

# USE CASES

Here is a description of a few of the popular use cases for Apache Kafka®. For an overview of a number of these areas in action, see [this blog post](#).

## Messaging

Kafka works well as a replacement for a more traditional message broker. Message brokers are used for a variety of reasons (to decouple processing from data producers, to buffer unprocessed messages, etc). In comparison to most messaging systems Kafka has better throughput, built-in partitioning, replication, and fault-tolerance which makes it a good solution for large scale message processing applications.

In our experience messaging uses are often comparatively low-throughput, but may require low end-to-end latency and often depend on the strong durability guarantees Kafka provides.

In this domain Kafka is comparable to traditional messaging systems such as [ActiveMQ](#) or [RabbitMQ](#).

## Website Activity Tracking

The original use case for Kafka was to be able to rebuild a user activity tracking pipeline as a set of real-time publish-subscribe feeds. This means site activity (page views, searches, or other actions users may take) is published to central topics with one topic per activity type. These feeds are available for subscription for a range of use cases including real-time processing, real-time monitoring, and loading into Hadoop or offline data warehousing systems for offline processing and reporting.

Activity tracking is often very high volume as many activity messages are generated for each user page view.

## Metrics

Kafka is often used for operational monitoring data. This involves aggregating statistics from distributed applications to produce centralized feeds of operational data.

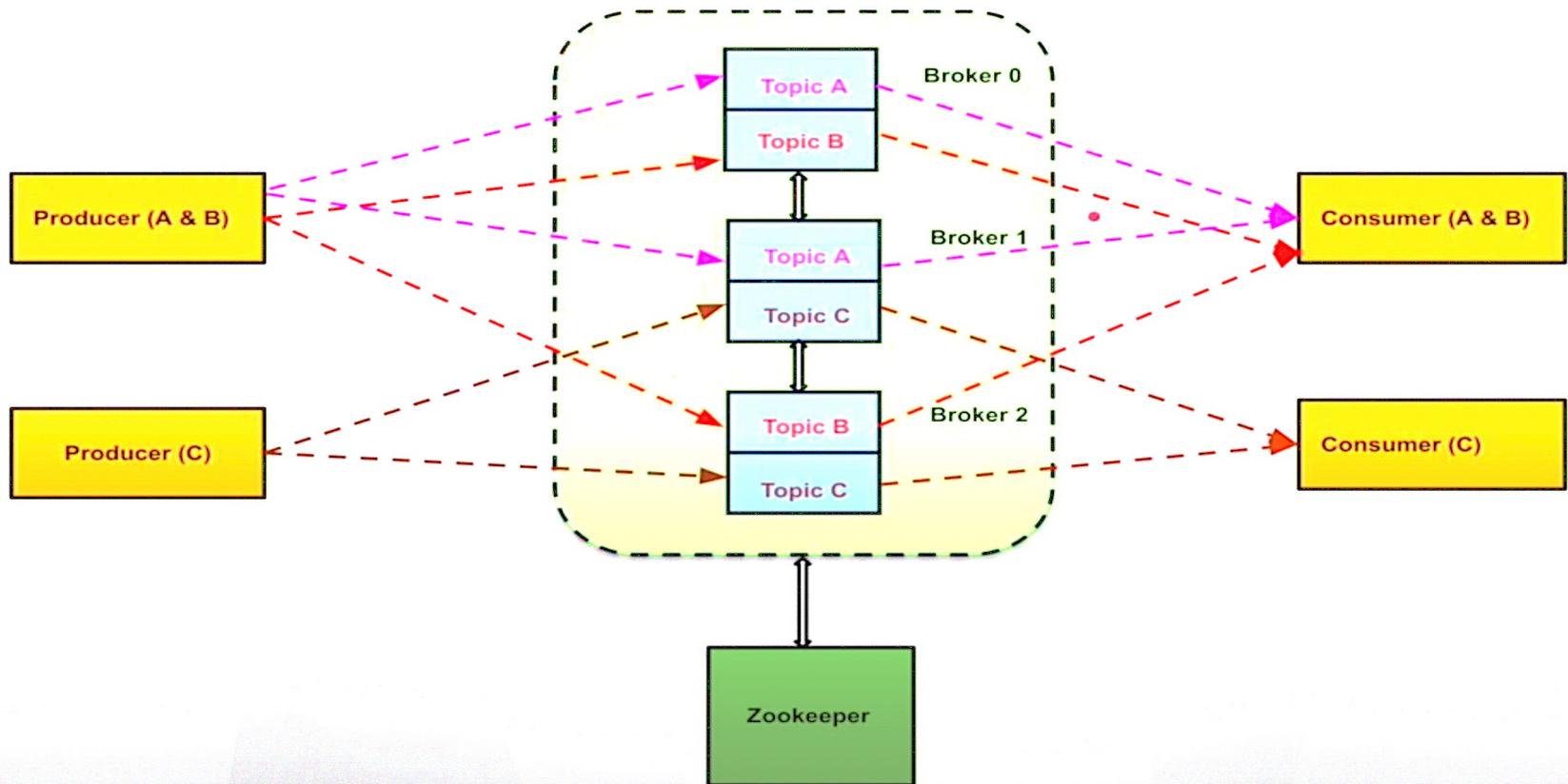
## Log Aggregation

Many people use Kafka as a replacement for a log aggregation solution. Log aggregation typically collects physical log files off servers and puts them in a central place (a file server or HDFS perhaps) for processing. Kafka abstracts away the details of files and gives a cleaner abstraction of log or event data as a stream of messages. This allows for lower-latency processing and easier support for multiple data sources and distributed data consumption. In comparison to log-centric systems like Scribe or Flume, Kafka offers equally good performance, stronger durability guarantees due to replication, and much lower end-to-end latency.

## Stream Processing

Many users of Kafka process data in processing pipelines consisting of multiple stages, where raw input data is consumed from Kafka topics and then aggregated, enriched, or otherwise transformed into new topics for further consumption or follow-up processing. For example, a processing pipeline for recommending news articles might crawl article content from RSS feeds and publish it to an "articles" topic; further processing might normalize or deduplicate this content and publish the cleansed article content to a new topic; a final processing stage might attempt to recommend this content to users. Such processing pipelines create graphs of real-time data flows based on the individual topics. Starting in 0.10.0.0, a light-weight but powerful stream processing library called [Kafka Streams](#) is available in Apache Kafka to perform such data processing as described above. Apart from Kafka Streams, alternative open source stream processing tools include [Apache Storm](#) and [Apache Samza](#).

# Simple Architecture



# Topics

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- Similar to an entity/ table in a database system.
- For example - Customer\_Info, Customer\_Orders, etc. in a Customer-Transactions System.
- Comprises of messages (aka records) written by one or more producers.
- Name of a topic is **unique** across a Kafka cluster.

# Messages

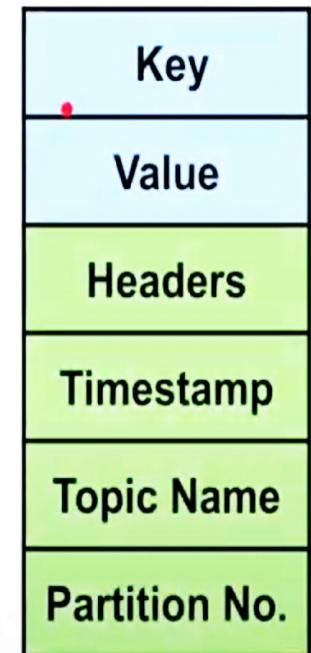
- A Kafka record pertaining to a topic.
- Consists of a key-value pair and a metadata.
- No specific data type. Simple bytes (or strings).
- Messages produced for a topic are identified by means of an **Offset** number (integer value).
- Metadata - headers, timestamp, topic name, partition number, etc.

Key
Value
Headers
Timestamp
Topic Name
Partition No.

# Sample Message

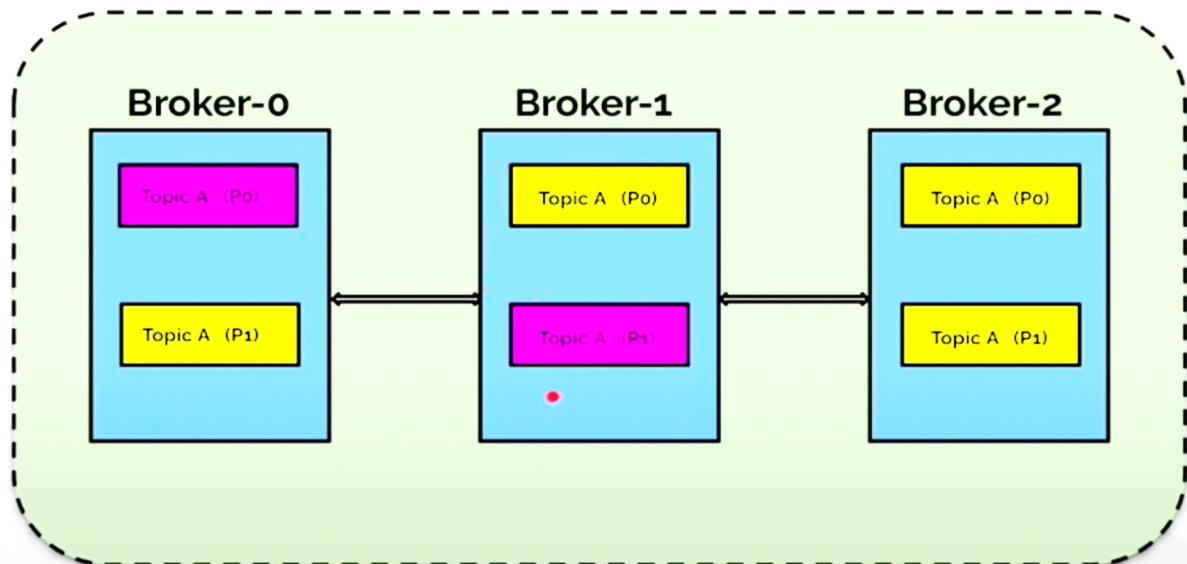
Example for a Kafka Message : Topic name = Customers

```
{  
    topic: "Customers",  
    timestamp : "2020-05-20T20:17:46.384Z",  
    partition : 0  
    value  
    {  
        "id": "100",  
        "name": "Ajith"  
    }  
}
```



# Partitions

- Unit of Storage
- Unlimited Scaling
- Records in a partition stored in order of arrival (identified by **Offset**)
- Topic creation
  - No. of partitions
  - Replication Factor
  - Retention period (7 days)
- Replication Factor less than or equal to number of brokers
- **Leader (Pink) and Follower (Yellow)**
  - Writes to leaders
  - One of followers will become leader when broker containing that partition fails



- Topic A created with 3 partitions and with a replication factor 3 on a 3-node Kafka Cluster (**Broker-0, Broker-1 and Broker-2**).

Topics	Partitions	Replicas	ISR	Leader
Topic A	P0	0,1,2	0,1,2	0
Topic A	P1	0,1,2	0,1,2	0
Topic A	P2	0,1,2	0,1,2	2

- Replica ID is same as the broker ID.

# Brokers & Controllers

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- Kafka Application running on a host machine. For sake of simplicity - Broker => a machine or a node.
- **Controller**
  - One of the brokers of a Kafka cluster.
  - Elected by the Zookeeper.
  - Decides which replica should become the leader for each partition.
  - Tracks the state of each partition (online, offline, new partition, partition deleted,etc..)

# Zookeeper

- Kafka Application running separately from brokers.
- If number Zookeepers > 1, then all of the work together as **Zookeeper Cluster**.
- Number of Zookeepers => Odd number.
- Tracks the state of Kafka brokers (alive brokers, crashed brokers, etc.).
- Elects a new controller whenever a broker fails.
- Contains **metadata** information
  - List of topics & number of partitions for each topic.
  - Location of all the replicas for each topic.
  - Information about ACLs (Access Control Lists)

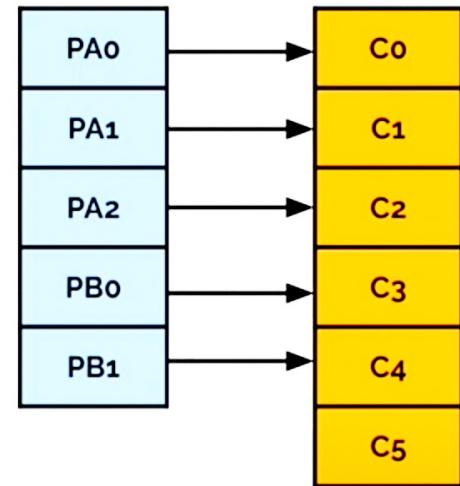
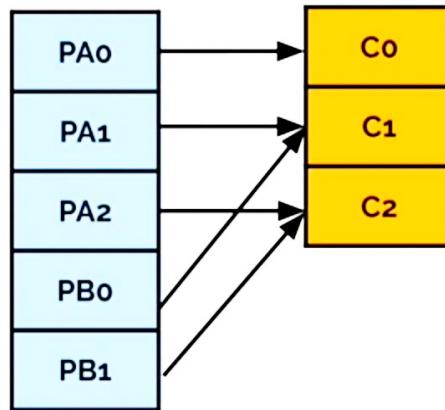
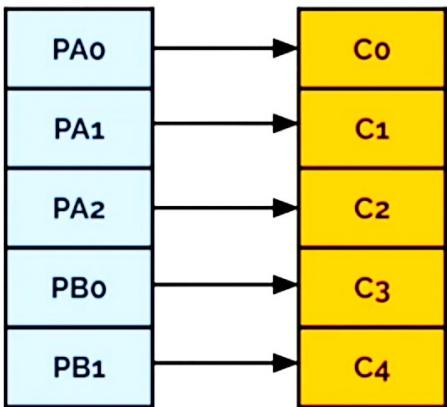
# Publisher

- Data Publishers - Produce messages to a topic.
- For example - A backend application writing to a database system.
- **Data Publishing Strategy**
  - To a specific partition if partition ID is specified in the message.
  - No partition ID? Hash of the key and total number of partitions available for the topic.
  - No partition ID and no key in message? **Round-Robin method** (default).
  - After a partition is assigned, writes are made to the **partition leader**.

# Subscriber

- Data Subscribers - Applications that receive the messages
- Consumers are identified by means of a consumer group.
- **Consumer Group** - Used to identify an application consuming from a topic.
- Each consumer group can subscribe to any number of topics.
- Number of Consumers in a consumer group should be less than or equal to the total number of partitions across all the topics being subscribed by the group.
- Each consumer in a group - A separate process running on same machine or different machines (or) a thread within a process.

# PUB-SUB



- Consumer group subscribes to two topics - Topic A and Topic B.
- Topic A contains 3 partitions - PA0, PA1, PA2.
- Topic B contains two partitions - Identified - PB0, PB1.



# DOWNLOAD

3.2.0 is the latest release. The current stable version is 3.2.0.

You can verify your download by following these [procedures](#) and using these [KEYS](#).

## 3.2.0

- Released May 17, 2022
- [Release Notes](#)
- Source download: [kafka-3.2.0-src.tgz \(asc, sha512\)](#)
- Binary downloads:
  - [Scala 2.12 - kafka\\_2.12-3.2.0.tgz \(asc, sha512\)](#)
  - [Scala 2.13 - kafka\\_2.13-3.2.0.tgz \(asc, sha512\)](#)

We build for multiple versions of Scala. This only matters if you are using Scala and you want a version built for the same Scala version you use. Otherwise any version should work (2.13 is recommended).

Kafka 3.2.0 includes a number of significant new features. Here is a summary of some notable changes:

- log4j 1.x is replaced with reload4j



We suggest the following site for your download:

[https://dlcdn.apache.org/kafka/3.2.0/kafka\\_2.12-3.2.0.tgz](https://dlcdn.apache.org/kafka/3.2.0/kafka_2.12-3.2.0.tgz)

Alternate download locations are suggested below.



It is essential that you verify the integrity of the downloaded file using the PGP signature ([.asc](#) file) or a hash ([.md5](#) or [.sha\\*](#) file).

## HTTP

[https://dlcdn.apache.org/kafka/3.2.0/kafka\\_2.12-3.2.0.tgz](https://dlcdn.apache.org/kafka/3.2.0/kafka_2.12-3.2.0.tgz)

## BACKUP SITE

[https://dlcdn.apache.org/kafka/3.2.0/kafka\\_2.12-3.2.0.tgz](https://dlcdn.apache.org/kafka/3.2.0/kafka_2.12-3.2.0.tgz)

## VERIFY THE INTEGRITY OF THE FILES

It is essential that you verify the integrity of the downloaded file using the PGP signature ([.asc](#) file) or a hash ([.md5](#) or [.sha\\*](#) file). Please read Verifying Apache Software Foundation Releases for more information on why you should verify our releases.

kafka\_2.12-3.2.0

A set of small, semi-transparent icons representing various file operations like New, Cut, Copy, Paste, Delete, Sort, View, and More.

Sort ▾

View ▾

...

A row of small, semi-transparent icons for navigating through the file structure: Back, Forward, Up, and a search icon.

kafka\_2.12-3.2.0

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Search kafka\_2.12-3.2.0

A vertical sidebar showing navigation links: Home (selected), Desktop, Downloads, Documents, Pictures, Music, Videos, OneDrive, This PC, and Network.

Name	Date modified	Type	Size
bin	25-06-2022 07:11	File folder	
config	25-06-2022 07:11	File folder	
libs	25-06-2022 07:11	File folder	
licenses	25-06-2022 07:11	File folder	
site-docs	25-06-2022 07:11	File folder	
LICENSE	03-05-2022 18:22	File	15 KB
NOTICE	03-05-2022 18:22	File	28 KB

## Download

Apache ZooKeeper 3.8.0 is our current release, and 3.7.1 our latest stable release.

### Apache ZooKeeper 3.8.0 (current release)

[Apache ZooKeeper 3.8.0\(asc, sha512\)](#)

[Apache ZooKeeper 3.8.0 Source Release\(asc, sha512\)](#)

### Apache ZooKeeper 3.7.1 (latest stable release)

[Apache ZooKeeper 3.7.1\(asc, sha512\)](#)

[Apache ZooKeeper 3.7.1 Source Release\(asc, sha512\)](#)

### Apache ZooKeeper 3.6.3

[Apache ZooKeeper 3.6.3\(asc, sha512\)](#)

[Apache ZooKeeper 3.6.3 Source Release\(asc, sha512\)](#)

### Apache ZooKeeper 3.5.10 (3.5 is EoL since 1st of June, 2022)

[Apache ZooKeeper 3.5.10\(asc, sha512\)](#)

[Apache ZooKeeper 3.5.10 Source Release\(asc, sha512\)](#)



## COMMUNITY-LED DEVELOPMENT "THE APACHE WAY"

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We suggest the following site for your download:

<https://dlcdn.apache.org/zookeeper/zookeeper-3.7.1/apache-zookeeper-3.7.1.tar.gz>

Alternate download locations are suggested below.

It is essential that you verify the integrity of the downloaded file using the PGP signature ([.asc](#) file) or a hash ([.md5](#) or [.sha\\*](#) file).

## HTTP

<https://dlcdn.apache.org/zookeeper/zookeeper-3.7.1/apache-zookeeper-3.7.1.tar.gz>

## BACKUP SITE

<https://dlcdn.apache.org/zookeeper/zookeeper-3.7.1/apache-zookeeper-3.7.1.tar.gz>

## VERIFY THE INTEGRITY OF THE FILES

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Search apache-zookeeper-3.7.1

Home Desktop Downloads Documents Pictures Local Disk (C:) Music Videos OneDrive This PC Desktop Documents Downloads Music Pictures Videos Local Disk (C:)

Name	Date modified	Type	Size
.github	25-06-2022 07:23	File folder	
bin	25-06-2022 07:23	File folder	
conf	25-06-2022 07:23	File folder	
dev	25-06-2022 07:23	File folder	
tools	25-06-2022 07:23	File folder	
zookeeper-assembly	25-06-2022 07:23	File folder	
zookeeper-client	25-06-2022 07:23	File folder	
zookeeper-compatibility-tests	25-06-2022 07:23	File folder	
zookeeper-contrib	25-06-2022 07:23	File folder	
zookeeper-docs	25-06-2022 07:23	File folder	
zookeeper-it	25-06-2022 07:23	File folder	
zookeeper-jute	25-06-2022 07:23	File folder	
zookeeper-metrics-providers	25-06-2022 07:23	File folder	
zookeeper-recipes	25-06-2022 07:23	File folder	
zookeeper-server	25-06-2022 07:23	File folder	
.asf.yaml	07-05-2022 12:14	YAML File	2 KB
.travis.yml	07-05-2022 12:14	YML File	1 KB
checkstyle-simple	07-05-2022 12:14	Microsoft Edge H...	3 KB

This PC > Local Disk (C:) > apache-zookeeper-3.7.1 > conf				Search conf
Name	Date modified	Type	Size	
configuration	07-05-2022 12:14	XSL Stylesheet	1 KB	
log4j.properties	07-05-2022 12:14	PROPERTIES File	4 KB	
[zoo.cfg]	07-05-2022 12:14	CFG File	2 KB	

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Name	Date modified	Type	Size
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bin	25-06-2022 07:23	File folder	
conf	25-06-2022 07:29	File folder	
dev	25-06-2022 07:23	File folder	
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tools	25-06-2022 07:23	File folder	
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zookeeper-client	25-06-2022 07:23	File folder	
zookeeper-compatibility-tests	25-06-2022 07:23	File folder	
zookeeper-contrib	25-06-2022 07:23	File folder	
zookeeper-docs	25-06-2022 07:23	File folder	
zookeeper-it	25-06-2022 07:23	File folder	
zookeeper-jute	25-06-2022 07:23	File folder	
zookeeper-metrics-providers	25-06-2022 07:23	File folder	
zookeeper-recipes	25-06-2022 07:23	File folder	
zookeeper-server	25-06-2022 07:23	File folder	
.asf.yaml	07-05-2022 12:14	YAML File	2 KB
.travis.yml	07-05-2022 12:14	YML File	1 KB



\*zoo.cfg - Notepad

File Edit View

```
# The number of milliseconds of each tick
tickTime=2000
# The number of ticks that the initial
# synchronization phase can take
initLimit=10
# The number of ticks that can pass between
# sending a request and getting an acknowledgement
syncLimit=5
# the directory where the snapshot is stored.
# do not use /tmp for storage, /tmp here is just
# example sakes.
dataDir=C:\apache-zookeeper-3.7.1\data
# the port at which the clients will connect
clientPort=2181
# the maximum number of client connections.
# increase this if you need to handle more clients
#maxClientCnxns=60
#
# Be sure to read the maintenance section of the
# administrator guide before turning on autopurge.
#
# http://zookeeper.apache.org/doc/current/zookeeperAdmin.html#sc_maintenance
#
# The number of snapshots to retain in dataDir
#autopurge.snapRetainCount=3
# Purge task interval in hours
# Set to "0" to disable auto purge feature
#autopurge.purgeInterval=1

## Metrics Providers
#
# https://prometheus.io Metrics Exporter
#metricsProvider.className=org.apache.zookeeper.metrics.prometheus.PrometheusMetricsProvider
#metricsProvider.httpPort=7000
#metricsProvider.httpPort=7000
```



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Search kafka\_2.12-3.2.0

Name	Date modified	Type	Size
bin	25-06-2022 07:16	File folder	
config	25-06-2022 07:16	File folder	
data	25-06-2022 07:53	File folder	
libs	25-06-2022 07:16	File folder	
licenses	25-06-2022 07:16	File folder	
site-docs	25-06-2022 07:11	File folder	
LICENSE	03-05-2022 18:22	File	15 KB
NOTICE	03-05-2022 18:22	File	28 KB



\*server.properties - Notepad

File Edit View

```
#listeners=PLAINTEXT://:9092

# Listener name, hostname and port the broker will advertise to clients.
# If not set, it uses the value for "listeners".
#advertised.listeners=PLAINTEXT://your.host.name:9092

# Maps listener names to security protocols, the default is for them to be the same. See the config documentation for more details
#listener.security.protocol.map=PLAINTEXT:PLAINTEXT,SSL:SSL,SASL_PLAINTEXT:SASL_PLAINTEXT,SASL_SSL:SASL_SSL

# The number of threads that the server uses for receiving requests from the network and sending responses to the network
num.network.threads=3

# The number of threads that the server uses for processing requests, which may include disk I/O
num.io.threads=8

# The send buffer (SO_SNDBUF) used by the socket server
socket.send.buffer.bytes=102400

# The receive buffer (SO_RCVBUF) used by the socket server
socket.receive.buffer.bytes=102400

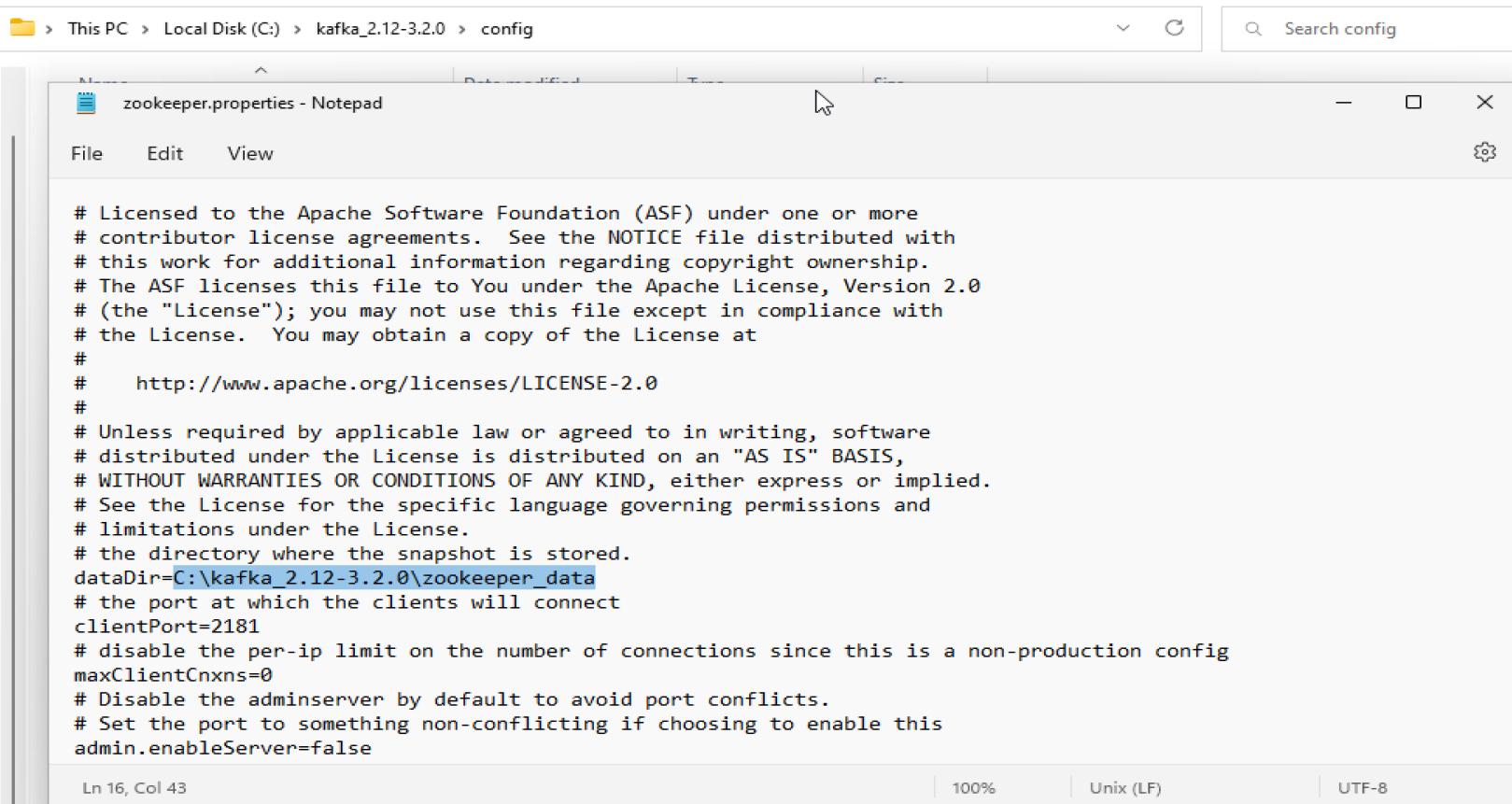
# The maximum size of a request that the socket server will accept (protection against OOM)
socket.request.max.bytes=104857600

#####
##### Log Basics #####
#####

# A comma separated list of directories under which to store log files
log.dirs=C:\kafka_2.12-3.2.0\data 
```

```
# The default number of log partitions per topic. More partitions allow greater
# parallelism for consumption, but this will also result in more files across
# the brokers.
num.partitions=1
```

This PC > Local Disk (C:) > kafka_2.12-3.2.0 >					Search kafka_2.12-3.2.0
Name	Date modified	Type	Size		
bin	25-06-2022 07:16	File folder			
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data	25-06-2022 07:53	File folder			
libs	25-06-2022 07:16	File folder			
licenses	25-06-2022 07:16	File folder			
logs	25-06-2022 08:26	File folder			
site-docs	25-06-2022 07:11	File folder			
zookeeper_data	25-06-2022 07:58	File folder			
LICENSE	03-05-2022 18:22	File	15 KB		
NOTICE	03-05-2022 18:22	File	28 KB		



This PC > Local Disk (C:) > kafka\_2.12-3.2.0 > config

zookeeper.properties - Notepad

```
# Licensed to the Apache Software Foundation (ASF) under one or more
# contributor license agreements. See the NOTICE file distributed with
# this work for additional information regarding copyright ownership.
# The ASF licenses this file to You under the Apache License, Version 2.0
# (the "License"); you may not use this file except in compliance with
# the License. You may obtain a copy of the License at
#
#     http://www.apache.org/licenses/LICENSE-2.0
#
# Unless required by applicable law or agreed to in writing, software
# distributed under the License is distributed on an "AS IS" BASIS,
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
# See the License for the specific language governing permissions and
# limitations under the License.
# the directory where the snapshot is stored.
dataDir=C:\kafka_2.12-3.2.0\zookeeper_data
# the port at which the clients will connect
clientPort=2181
# disable the per-ip limit on the number of connections since this is a non-production config
maxClientCnxns=0
# Disable the adminserver by default to avoid port conflicts.
# Set the port to something non-conflicting if choosing to enable this
admin.enableServer=false
```

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Environment Variables

User variables for itsuresha

Variable	Value
JAVA_HOME	C:\Program Files\Java\jre1.8.0_333
OneDrive	C:\Users\itsuresha\OneDrive
OneDriveConsumer	C:\Users\itsuresha\OneDrive
Path	C:\Users\itsuresha\AppData\Local\Microsoft\WindowsApps;C:\Pro...
TEMP	C:\Users\itsuresha\AppData\Local\Temp
TMP	C:\Users\itsuresha\AppData\Local\Temp

Edit User Variable

Variable name: JAVA\_HOME

Variable value: C:\Program Files\Java\jre1.8.0\_333

Browse Directory... Browse File... OK Cancel

User variables for itsuresha

Variable	Value
OneDrive	C:\Users\itsuresha\OneDrive
OneDriveConsumer	C:\Users\itsuresha\OneDrive
Path	C:\Users\itsuresha\AppData\Local\Microsoft\WindowsApps;C:\Pro...
TEMP	C:\Users\itsuresha\AppData\Local\Temp
TMP	C:\Users\itsuresha\AppData\Local\Temp
ZOOKEEPER_HOME	C:\apache-zookeeper-3.7.1

Edit User Variable

Variable name: ZOOKEEPER\_HOME

Variable value: C:\apache-zookeeper-3.7.1

Browse Directory... Browse File... OK Cancel

Environment Variables

Variable	Value
JAVA_HOME	C:\Program Files\Java\jre1.8.0_333
NUMBER_OF_PROCESSORS	4
OS	Windows_NT
Path	C:\Program Files (x86)\Common Files\Oracle\Java\javapath;C:\Win...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC

New... Edit... Delete OK Cancel

Environment Variables

Variable	Value
TEMP	C:\Windows\TEMP
TMP	C:\Windows\TEMP
USERNAME	SYSTEM
windir	C:\Windows
ZOOKEEPER_HOME	C:\apache-zookeeper-3.7.1

New... Edit... Delete OK Cancel

```
... Select Administrator: Command Prompt - zookeeper-server-start.bat C:\kafka_2.12-3.2.0\config\zookeeper.properties
c:\>cd kafka_2.12-3.2.0\bin\windows

c:\kafka_2.12-3.2.0\bin\windows>zookeeper-server-start.bat C:\kafka_2.12-3.2.0\config\zookeeper.properties
[2022-06-25 08:38:51,915] INFO Reading configuration from: C:\kafka_2.12-3.2.0\config\zookeeper.properties (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,923] WARN C:kafka_2.12-3.2.0zookeeper_data is relative. Prepend .\ to indicate that you're sure! (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,928] INFO clientPortAddress is 0.0.0.0:2181 (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,928] INFO secureClientPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,929] INFO observerMasterPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,929] INFO metricsProvider.className is org.apache.zookeeper.metrics.impl.DefaultMetricsProvider (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,933] INFO autopurge.snapRetainCount set to 3 (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-25 08:38:51,933] INFO autopurge.purgeInterval set to 0 (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-25 08:38:51,933] INFO Purge task is not scheduled. (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-25 08:38:51,934] WARN Either no config or no quorum defined in config, running in standalone mode (org.apache.zookeeper.server.quorum.QuorumPeerMain)
[2022-06-25 08:38:51,936] INFO Log4j 1.2 jmx support not found; jmx disabled. (org.apache.zookeeper.jmx.ManagedUtil)
[2022-06-25 08:38:51,937] INFO Reading configuration from: C:\kafka_2.12-3.2.0\config\zookeeper.properties (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,938] WARN C:kafka_2.12-3.2.0zookeeper_data is relative. Prepend .\ to indicate that you're sure! (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,939] INFO clientPortAddress is 0.0.0.0:2181 (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,939] INFO secureClientPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,939] INFO observerMasterPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,940] INFO metricsProvider.className is org.apache.zookeeper.metrics.impl.DefaultMetricsProvider (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-25 08:38:51,940] INFO Starting server (org.apache.zookeeper.server.ZooKeeperServerMain)
[2022-06-25 08:38:51,966] INFO ServerMetrics initialized with provider org.apache.zookeeper.metrics.impl.DefaultMetricsProvider@668bc3d5 (org.apache.zookeeper.server.ServerMetrics)
[2022-06-25 08:38:51,977] INFO zookeeper.snapshot.trust.empty : false (org.apache.zookeeper.server.persistence.FileTxnSnapLog)
[2022-06-25 08:38:52,017] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,017] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,018] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,018] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,018] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,019] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,019] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,020] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,020] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,023] INFO Server environment:zookeeper.version=3.6.3--6401e4ad2087061bc6b9f80dec2d69f2e3c8660a, built on 04/08/2021 16:35 GMT (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,024] INFO Server environment:host.name=DESKTOP-IEFNU6I (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-25 08:38:52,024] INFO Server environment:java.version=1.8.0_333 (org.apache.zookeeper.server.ZooKeeperServer)
```

cmd Select Administrator: Command Prompt - kafka-server-start.bat C:\kafka\_2.12-3.2.0\config\server.properties

C:\Windows\System32>cd c:\

c:\>cd kafka\_2.12-3.2.0\bin\windows

```
c:\kafka_2.12-3.2.0\bin\windows>kafka-server-start.bat C:\kafka_2.12-3.2.0\config\server.properties
[2022-06-25 08:39:37,517] INFO Registered kafka:type=kafka.Log4jController MBean (kafka.utils.Log4jControllerRegistration$)
[2022-06-25 08:39:38,655] INFO Setting -D jdk.tls.rejectClientInitiatedRenegotiation=true to disable client-initiated TLS renegotiation (org.apache.zookeeper.common.X509Util)
[2022-06-25 08:39:38,872] INFO starting (kafka.server.KafkaServer)
[2022-06-25 08:39:38,873] INFO Connecting to zookeeper on localhost:2181 (kafka.server.KafkaServer)
[2022-06-25 08:39:38,988] INFO [ZooKeeperClient Kafka server] Initializing a new session to localhost:2181. (kafka.zookeeper.ZooKeeperClient)
[2022-06-25 08:39:39,007] INFO Client environment:zookeeper.version=3.6.3--6401e4ad2087061bc6b9f80dec2d69f2e3c8660a, built on 04/08/2021 16:35 GMT (org.apache.zookeeper.ZooKeeper)
[2022-06-25 08:39:39,007] INFO Client environment:host.name=DESKTOP-IEFNU6I (org.apache.zookeeper.ZooKeeper)
[2022-06-25 08:39:39,007] INFO Client environment:java.version=1.8.0_333 (org.apache.zookeeper.ZooKeeper)
[2022-06-25 08:39:39,007] INFO Client environment:java.vendor=Oracle Corporation (org.apache.zookeeper.ZooKeeper)
[2022-06-25 08:39:39,007] INFO Client environment:java.home=C:\Program Files\Java\jre1.8.0_333 (org.apache.zookeeper.ZooKeeper)
[2022-06-25 08:39:39,007] INFO Client environment:java.class.path=c:\kafka_2.12-3.2.0\libs\activation-1.1.1.jar;c:\kafka_2.12-3.2.0\libs\apollion-repackaged-2.6.1.jar;c:\kafka_2.12-3.2.0\libs\argparse4j-0.7.0.jar;c:\kafka_2.12-3.2.0\libs\audience-annotations-0.5.0.jar;c:\kafka_2.12-3.2.0\libs\commons-cli-1.4.jar;c:\kafka_2.12-3.2.0\libs\commons-lang3-3.8.1.jar;c:\kafka_2.12-3.2.0\libs\connect-api-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-basic-auth-extension-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-file-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-json-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-mirror-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-mirror-client-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-runtime-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\connect-transforms-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\hk2-api-2.6.1.jar;c:\kafka_2.12-3.2.0\libs\hk2-locator-2.6.1.jar;c:\kafka_2.12-3.2.0\libs\hk2-utils-2.6.1.jar;c:\kafka_2.12-3.2.0\libs\jackson-annotations-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-core-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-databind-2.12.6.1.jar;c:\kafka_2.12-3.2.0\libs\jackson-dataformat-csv-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-datatype-jdk8-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-jaxrs-base-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-jaxrs-json-provider-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-module-jaxb-annotations-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jackson-module-scala-2.12-2.12.6.jar;c:\kafka_2.12-3.2.0\libs\jakarta.activation-api-1.2.1.jar;c:\kafka_2.12-3.2.0\libs\jakarta.annotation-api-1.3.5.jar;c:\kafka_2.12-3.2.0\libs\jakarta.inject-2.6.1.jar;c:\kafka_2.12-3.2.0\libs\jakarta.validation-api-2.0.2.jar;c:\kafka_2.12-3.2.0\libs\jakarta.ws.rs-api-2.1.6.jar;c:\kafka_2.12-3.2.0\libs\jakarta.xml.bind-api-2.3.2.jar;c:\kafka_2.12-3.2.0\libs\javassist-3.27.0-GA.jar;c:\kafka_2.12-3.2.0\libs\javax.servlet-api-3.1.0.jar;c:\kafka_2.12-3.2.0\libs\jaxws.rs-api-2.1.1.jar;c:\kafka_2.12-3.2.0\libs\jaxb-api-2.3.0.jar;c:\kafka_2.12-3.2.0\libs\jersey-client-2.34.jar;c:\kafka_2.12-3.2.0\libs\jersey-common-2.34.jar;c:\kafka_2.12-3.2.0\libs\jersey-container-servlet-2.34.jar;c:\kafka_2.12-3.2.0\libs\jersey-container-servlet-core-2.34.jar;c:\kafka_2.12-3.2.0\libs\jersey-hk2-2.34.jar;c:\kafka_2.12-3.2.0\libs\jersey-server-2.34.jar;c:\kafka_2.12-3.2.0\libs\jetty-client-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-continuation-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-http-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-io-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-security-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-server-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-servlet-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-servlets-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-util-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\jetty-util-ajax-9.4.44.v20210927.jar;c:\kafka_2.12-3.2.0\libs\kafka-clients-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-log4j-appender-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-metadata-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-raft-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-server-common-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-shell-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-storage-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-storage-api-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-streams-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-streams-examples-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-streams-scala-2.12-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-streams-test-utils-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka-tools-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\kafka_2.12-3.2.0.jar;c:\kafka_2.12-3.2.0\libs\lzf-java-1.8.0.jar;c:\kafka_2.12-3.2.0\libs\maven-artifact-3.8.4.jar;c:\kafka_2.12-3.2.0\libs\metrics-core-2.2.0.jar;c:\kafka_2.12-3.2.0\libs\metrics-core-4.1.1.2.jar;c:\kafka_2.12-3.2.0\libs\netty-buffer-4.1.73.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-codec-4.1.73.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-common-4.1.73.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-handler-4.1.73.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-resolver-4.1.73.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-tcnative-classes-2.0.46.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-transport-4.1.73.Final.jar;c:\kafka_2.12-3.2.0\libs\netty-transport-classes-epoll-4.1.73.F
```

```
c:\ Select Administrator: Command Prompt - kafka-console-producer.bat --bootstrap-server localhost:9092 --topic Topic1  
at kafka.admin.TopicCommand.main(TopicCommand.scala)
```

```
c:\kafka_2.12-3.2.0\bin\windows>kafka-topics.bat --create --topic test-topic --bootstrap-server localhost:9092 --replication-factor 1 --partitions 4  
Created topic test-topic.
```

```
c:\kafka_2.12-3.2.0\bin\windows>kafka-console-producer.bat --bootstrap-server localhost:9092 --topic Topic1  
>hai  
>this is new msg  
>.
```

```
c:\ Select Administrator: Command Prompt - kafka-console-consumer.bat --bootstrap-server localhost:9092 --topic Topic1  
Microsoft Windows [Version 10.0.25140.1000]  
(c) Microsoft Corporation. All rights reserved.
```

```
C:\Windows\System32>cd c:\
```

```
c:\>cd kafka_2.12-3.2.0\bin\windows
```

```
c:\kafka_2.12-3.2.0\bin\windows>kafka-console-consumer.bat --bootstrap-server localhost:9092 --topic Topic1  
[2022-06-25 08:50:21,692] WARN [Consumer clientId=console-consumer, groupId=console-consumer-75030] Error while fetching metadata with correlation id 2 : {Topic1=LEADER_NOT_AVAILABLE} (org.apache.kafka.clients.NetworkClient)  
[2022-06-25 08:50:21,912] WARN [Consumer clientId=console-consumer, groupId=console-consumer-75030] Error while fetching metadata with correlation id 4 : {Topic1=LEADER_NOT_AVAILABLE} (org.apache.kafka.clients.NetworkClient)  
>hai  
>this is new msg
```

Activities Terminal Jun 24 03:24 itsuresha@ubuntu: ~/kafka\_2.12-3.2.0/bin

```
itsuresha@ubuntu:~$ ls
Desktop Documents Downloads kafka_2.12-3.2.0 kafka_2.12-3.2.0.tgz Music Pictures Public Templates Videos
itsuresha@ubuntu:~$ cd kafka_2.12-3.2.0/
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ cd bin
itsuresha@ubuntu:~/kafka_2.12-3.2.0/bin$ ls
connect-distributed.sh      kafka-consumer-perf-test.sh    kafka-producer-perf-test.sh    kafka-verifiable-consume
r.sh                         kafka-delegation-tokens.sh   kafka-reassign-partitions.sh   kafka-verifiable-produce
connect-mirror-maker.sh     kafka-delete-records.sh    kafka-replica-verification.sh trogdr.sh
r.sh                         kafka-dump-log.sh        kafka-run-class.sh           windows
connect-standalone.sh       kafka-features.sh       kafka-server-start.sh       zookeeper-security-migra
kafka-acls.sh               kafka-get-offsets.sh     kafka-server-stop.sh        zookeeper-server-start.s
kafka-broker-api-versions.sh kafka-leader-election.sh kafka-storage.sh          zookeeper-server-stop.sh
tion.sh                     kafka-log-dir.sh       kafka-streams-application-reset.sh  zookeeper-shell.sh
kafka-cluster.sh            kafka-metadata-shell.sh kafka-topics.sh
h                           kafka-mirror-maker.sh  kafka-transactions.sh
kafka-configs.sh            kafka-console-consumer.sh kafka-storage.sh
kafka-console-consumer.sh   kafka-console-producer.sh kafka-streams-application-reset.sh
kafka-console-producer.sh   kafka-consumer-groups.sh kafka-topics.sh
kafka-consumer-groups.sh   kafka-leader-election.sh  kafka-transactions.sh
itsuresha@ubuntu:~/kafka_2.12-3.2.0/bin$
```

```
itsuresha@ubuntu:~/kafka_2.12-3.2.0/bin$ sh kafka-topics.sh
Create, delete, describe, or change a topic.
Option          Description
-----
--alter          Alter the number of partitions,
                 replica assignment, and/or
                 configuration for the topic.
--at-min-isr-partitions if set when describing topics, only
                         show partitions whose isr count is
                         equal to the configured minimum.
--bootstrap-server <String: server to
                   connect to>
--command-config <String: command
                  config property file>

--config <String: name=value>
```

-----  
REQUIRED: The Kafka server to connect to.  
Property file containing configs to be passed to Admin Client. This is used only with --bootstrap-server option for describing and altering broker configs.  
A topic configuration override for the topic being created or altered. The following is a list of valid configurations:  
cleanup.policy  
compression.type  
delete.retention.ms  
file.delete.delay.ms  
flush.messages  
flush.ms  
follower.replication.throttled.



itsuresha@ubuntu: ~



```
itsuresha@ubuntu:~/kafka_2.12-3.2.0/bin$ cd
itsuresha@ubuntu:~$ sh kafka-topics.sh
sh: 0: cannot open kafka-topics.sh: No such file
itsuresha@ubuntu:~$ kafka-topics.sh
kafka-topics.sh: command not found
itsuresha@ubuntu:~$ java -version
openjdk version "11.0.15" 2022-04-19
OpenJDK Runtime Environment (build 11.0.15+10-Ubuntu-0ubuntu0.22.04.1)
OpenJDK 64-Bit Server VM (build 11.0.15+10-Ubuntu-0ubuntu0.22.04.1, mixed mode)
itsuresha@ubuntu:~$ sudo apt install default-jre
[sudo] password for itsuresha:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
default-jre is already the newest version (2:1.11-72build2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
itsuresha@ubuntu:~$ 
```



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DOWNLOAD KAFKA

# DOWNLOAD

3.2.0 is the latest release. The current stable version is 3.2.0.

You can verify your download by following these [procedures](#) and using these [KEYS](#).

## 3.2.0

- Released May 17, 2022
- [Release Notes](#)
- Source download: [kafka-3.2.0-src.tgz \(asc, sha512\)](#)
- Binary downloads:
  - [Scala 2.12 - kafka\\_2.12-3.2.0.tgz \(asc, sha512\)](#)
  - [Scala 2.13 - kafka\\_2.13-3.2.0.tgz \(asc, sha512\)](#)

We build for multiple versions of Scala. This only matters if you are using Scala and you want a version built for the same Scala version you use. Otherwise any version should work (2.13 is recommended).



## COMMUNITY-LED DEVELOPMENT "THE APACHE WAY"

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We suggest the following site for your download:

[https://dlcdn.apache.org/kafka/3.2.0/kafka\\_2.12-3.2.0.tgz](https://dlcdn.apache.org/kafka/3.2.0/kafka_2.12-3.2.0.tgz)

Alternate download locations are suggested below.

It is essential that you [verify the integrity](#) of the downloaded file using the PGP signature ([.asc](#) file) or a hash ([.md5](#) or [.sha\\*](#) file).

## HTTP

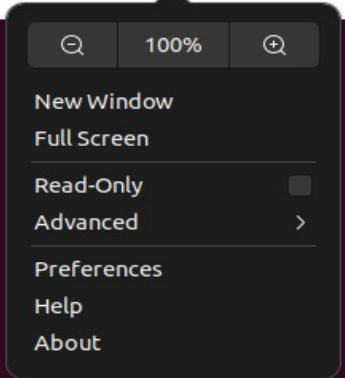
[https://dlcdn.apache.org/kafka/3.2.0/kafka\\_2.12-3.2.0.tgz](https://dlcdn.apache.org/kafka/3.2.0/kafka_2.12-3.2.0.tgz)

## BACKUP SITE

[https://dlcdn.apache.org/kafka/3.2.0/kafka\\_2.12-3.2.0.tgz](https://dlcdn.apache.org/kafka/3.2.0/kafka_2.12-3.2.0.tgz)

## VERIFY THE INTEGRITY OF THE FILES

itsuresha@ubuntu:~\$ wget https://dlcdn.apache.org/kafka/3.2.0/kafka\_2.12-3.2.0.tgz  
--2022-06-24 03:42:08-- https://dlcdn.apache.org/kafka/3.2.0/kafka\_2.12-3.2.0.tgz  
Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644  
Connecting to dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:443... connected.  
HTTP request sent, awaiting response... 200 OK  
Length: 104000785 (99M) [application/x-gzip]  
Saving to: 'kafka\_2.12-3.2.0.tgz.1'  
  
kafka\_2.12-3.2.0.tgz.1 100%[=====] 99.18M  
2022-06-24 03:42:37 (3.40 MB/s) - 'kafka\_2.12-3.2.0.tgz.1' saved [104000785/104000785]  
  
itsuresha@ubuntu:~\$ ls  
Desktop Downloads kafka\_2.12-3.2.0.tgz Music Public Videos  
Documents kafka\_2.12-3.2.0 kafka\_2.12-3.2.0.tgz.1 Pictures Templates  
itsuresha@ubuntu:~\$ tar -xvf ^C  
itsuresha@ubuntu:~\$ tar -xvf kafka\_2.12-3.2.0.tgz.1  
kafka\_2.12-3.2.0/  
kafka\_2.12-3.2.0/LICENSE  
kafka\_2.12-3.2.0/NOTICE  
kafka\_2.12-3.2.0/bin/  
kafka\_2.12-3.2.0/bin/kafka-delete-records.sh  
kafka\_2.12-3.2.0/bin/trogdor.sh  
kafka\_2.12-3.2.0/bin/connect-mirror-maker.sh  
kafka\_2.12-3.2.0/bin/kafka-console-consumer.sh  
kafka\_2.12-3.2.0/bin/kafka-consumer-perf-test.sh  
kafka\_2.12-3.2.0/bin/kafka-log-dirs.sh  
kafka\_2.12-3.2.0/bin/zookeeper-server-stop.sh



Data Science Education & Research 40



itsuresha@ubuntu: ~/kafka\_2.12-3.2.0



```
itsuresha@ubuntu:~$ cd kafka_2.12-3.2.0
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh
Create, delete, describe, or change a topic.
Option                                Description
-----
--alter                               Alter the number of partitions,
                                         replica assignment, and/or
                                         configuration for the topic.
                                         if set when describing topics, only
                                         show partitions whose isr count is
                                         equal to the configured minimum.
--bootstrap-server <String: server to
  connect to>
--command-config <String: command
  config property file>

--config <String: name=value>
```

```
                                         REQUIRED: The Kafka server to connect
                                         to.
                                         Property file containing configs to be
                                         passed to Admin Client. This is used
                                         only with --bootstrap-server option
                                         for describing and altering broker
                                         configs.
                                         A topic configuration override for the
                                         topic being created or altered. The
                                         following is a list of valid
                                         configurations:
                                         cleanup.policy
                                         compression.type
                                         delete.retention.ms
                                         file.delete.delay.ms
                                         flush.messages
                                         flush.ms
```



itsuresha@ubuntu: ~/kafka\_2.12-3.2.0/bin



```
itsuresha@ubuntu:~$ cd kafka_2.12-3.2.0/bin  
itsuresha@ubuntu:~/kafka_2.12-3.2.0/bin$ pwd  
/home/itsuresha/kafka_2.12-3.2.0/bin  
itsuresha@ubuntu:~/kafka_2.12-3.2.0/bin$ 
```



itsuresha@ubuntu: ~/kafka\_2.12-3.2.0/bin



```
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin:/home/itsuresha/kafka_2.12-  
3.2.0/bin"
```

~  
~  
~  
~  
~  
~  
~



itsuresha@ubuntu: ~/kafka\_2.12-3.2.0



```
itsuresha@ubuntu: ~/kafka_2.1... x itsuresha@ubuntu: ~/kafka_2.1... x itsuresha@ubuntu: ~/kafka_2.1... x itsuresha@ubuntu: ~/kafka_2.1... x
USAGE: bin/zookeeper-server-start.sh [-daemon] zookeeper.properties
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/zookeeper-server-start.sh config/zookeeper.properties
[2022-06-23 13:34:13,502] INFO Reading configuration from: config/zookeeper.properties (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,503] WARN config/zookeeper.properties is relative. Prepend ./ to indicate that you're sure! (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO clientPortAddress is 0.0.0.0:2181 (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO secureClientPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO observerMasterPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO metricsProvider.className is org.apache.zookeeper.metrics.impl.DefaultMetricsProvider (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,508] INFO autopurge.snapRetainCount set to 3 (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-23 13:34:13,508] INFO autopurge.purgeInterval set to 0 (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-23 13:34:13,508] INFO Purge task is not scheduled. (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-23 13:34:13,508] WARN Either no config or no quorum defined in config, running in standalone mode (org.apache.zookeeper.server.quorum.QuorumPeerMain)
[2022-06-23 13:34:13,508] INFO Log4j 1.2 jmx support not found; jmx disabled. (org.apache.zookeeper.jmx.ManagedUtil)
[2022-06-23 13:34:13,509] INFO Reading configuration from: config/zookeeper.properties (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] WARN config/zookeeper.properties is relative. Prepend ./ to indicate that you're sure! (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO clientPortAddress is 0.0.0.0:2181 (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO secureClientPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO observerMasterPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO metricsProvider.className is org.apache.zookeeper.metrics.impl.DefaultMetricsProvider (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO Starting server (org.apache.zookeeper.server.ZooKeeperServerMain)
[2022-06-23 13:34:13,515] INFO ServerMetrics initialized with provider org.apache.zookeeper.metrics.impl.DefaultMetricsProvider@2177849e (org.apache.zookeeper.server.ServerMetrics)
[2022-06-23 13:34:13,517] INFO zookeeper.snapshot.trust.empty : false (org.apache.zookeeper.server.persistence.FileTxnSnapLog)
[2022-06-23 13:34:13,529] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-23 13:34:13,529] INFO _____ (org.apache.zookeeper.server.ZooKeeperServer)
```

```
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0$ bin/zookeeper-server-start.sh config/zookeeper.properties
[2022-06-23 13:34:13,502] INFO Reading configuration from: config/zookeeper.properties (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,503] WARN config/zookeeper.properties is relative. Prepend ./ to indicate that you're sure! (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO clientPortAddress is 0.0.0.0:2181 (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO secureClientPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO observerMasterPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,506] INFO metricsProvider.className is org.apache.zookeeper.metrics.impl.DefaultMetricsProvider (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,508] INFO autopurge.snapRetainCount set to 3 (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-23 13:34:13,508] INFO autopurge.purgeInterval set to 0 (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-23 13:34:13,508] INFO Purge task is not scheduled. (org.apache.zookeeper.server.DatadirCleanupManager)
[2022-06-23 13:34:13,508] WARN Either no config or no quorum defined in config, running in standalone mode (org.apache.zookeeper.server.quorum.QuorumPeerMain)
[2022-06-23 13:34:13,508] INFO Log4j 1.2 jmx support not found; jmx disabled. (org.apache.zookeeper.jmx.ManagedUtil)
[2022-06-23 13:34:13,509] INFO Reading configuration from: config/zookeeper.properties (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] WARN config/zookeeper.properties is relative. Prepend ./ to indicate that you're sure! (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO clientPortAddress is 0.0.0.0:2181 (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO secureClientPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO observerMasterPort is not set (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO metricsProvider.className is org.apache.zookeeper.metrics.impl.DefaultMetricsProvider (org.apache.zookeeper.server.quorum.QuorumPeerConfig)
[2022-06-23 13:34:13,509] INFO Starting server (org.apache.zookeeper.server.ZooKeeperServerMain)
[2022-06-23 13:34:13,515] INFO ServerMetrics initialized with provider org.apache.zookeeper.metrics.impl.DefaultMetricsProvider@2177849e (org.apache.zookeeper.server.ServerMetrics)
[2022-06-23 13:34:13,517] INFO zookeeper.snapshot.trust.empty : false (org.apache.zookeeper.server.persistence.FileTxnSnapLog)
[2022-06-23 13:34:13,529] INFO (org.apache.zookeeper.server.ZooKeeperServer)
[2022-06-23 13:34:13,529] INFO _____ (org.apache.zookeeper.server.ZooKeeperServer)
```

itsuresha@ubuntu: ~/kafka\_2.12-3.2.0



```
itsuresha@ubuntu:~/kafka_2.1... x itsuresha@ubuntu:~/kafka_2.1... x itsuresha@ubuntu:~/kafka_2.1... x itsuresha@ubuntu:~/kafka_2.1... x itsuresha@ubuntu:~/kafka_2.1...
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-server-start.sh config/server.properties
[2022-06-23 13:36:25,591] INFO Registered kafka:type=kafka.Log4jController MBean (kafka.utils.Log4jControllerRegistration$)
[2022-06-23 13:36:25,804] INFO Setting -D jdk.tls.rejectClientInitiatedRenegotiation=true to disable client-initiated TLS renegotiation (org.apache.zookeeper.common.X509Util)
[2022-06-23 13:36:25,864] INFO Registered signal handlers for TERM, INT, HUP (org.apache.kafka.common.utils.LoggingSignalHandler)
[2022-06-23 13:36:25,865] INFO starting (kafka.server.KafkaServer)
[2022-06-23 13:36:25,865] INFO Connecting to zookeeper on localhost:2181 (kafka.server.KafkaServer)
[2022-06-23 13:36:25,872] INFO [ZooKeeperClient Kafka server] Initializing a new session to localhost:2181. (kafka.zookeeper.ZooKeeperClient)
[2022-06-23 13:36:25,875] INFO Client environment:zookeeper.version=3.6.3--6401e4ad2087061bc6b9f80dec2d69f2e3c8660a, built on 04/08/2021 16:35 GMT (org.apache.zookeeper.ZooKeeper)
[2022-06-23 13:36:25,875] INFO Client environment:host.name=ubuntu (org.apache.zookeeper.ZooKeeper)
[2022-06-23 13:36:25,875] INFO Client environment:java.version=11.0.15 (org.apache.zookeeper.ZooKeeper)
[2022-06-23 13:36:25,875] INFO Client environment:java.vendor=Private Build (org.apache.zookeeper.ZooKeeper)
[2022-06-23 13:36:25,875] INFO Client environment:java.home=/usr/lib/jvm/java-11-openjdk-arm64 (org.apache.zookeeper.ZooKeeper)
[2022-06-23 13:36:25,875] INFO Client environment:java.class.path=/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/activation-1.1.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/aopalliance-repackaged-2.6.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/argparse4j-0.7.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/audience-annotations-0.5.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/commons-cli-1.4.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/commons-lang3-3.8.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-api-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-basic-auth-extension-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-json-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-mirror-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-mirror-client-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-runtime-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/connect-transforms-3.2.0.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/hk2-api-2.6.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/hk2-locator-2.6.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/hk2-utils-2.6.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-annotations-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-core-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-databind-2.12.6.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-dataformat-csv-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-datatype-jdk8-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-jaxrs-base-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-jaxrs-json-provider-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-module-jaxb-annotations-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jackson-module-scala_2.12-2.12.6.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jakarta.activation-api-1.2.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jakarta.injec-t-2.6.1.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jakarta.annotation-api-1.3.5.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/../libs/jakarta.validation-api-2.0.2.jar:/home/itsuresha/kafka_2.12-3.2.0/bin/..
```



```
er)
[2022-06-23 13:36:26,760] INFO [/config/changes-event-process-thread]: Starting (kafka.common.ZkNodeChangeNotificationListener$ChangeEventProcessThread)
[2022-06-23 13:36:26,769] INFO [SocketServer listenerType=ZK_BROKER, nodeId=0] Starting socket server acceptors and processors (kafka.network.SocketServer)
[2022-06-23 13:36:26,772] INFO [SocketServer listenerType=ZK_BROKER, nodeId=0] Started data-plane acceptor and processor(s) for endpoint : ListenerName(PLAINTEXT) (kafka.network.SocketServer)
[2022-06-23 13:36:26,772] INFO [SocketServer listenerType=ZK_BROKER, nodeId=0] Started socket server acceptors and processors (kafka.network.SocketServer)
[2022-06-23 13:36:26,775] INFO Kafka version: 3.2.0 (org.apache.kafka.common.utils.AppInfoParser)
[2022-06-23 13:36:26,775] INFO Kafka commitId: 38103ffaa962ef50 (org.apache.kafka.common.utils.AppInfoParser)
[2022-06-23 13:36:26,775] INFO Kafka startTimeMs: 1655991386772 (org.apache.kafka.common.utils.AppInfoParser)
[2022-06-23 13:36:26,775] INFO [KafkaServer id=0] started (kafka.server.KafkaServer)
[2022-06-23 13:36:26,804] INFO [BrokerToControllerChannelManager broker=0 name=forwarding]: Recorded new controller, from now on will use broker ubuntu:9092 (id: 0 rack: null) (kafka.server.BrokerToControllerRequestThread)
[2022-06-23 13:36:26,828] INFO [BrokerToControllerChannelManager broker=0 name=alterPartition]: Recorded new controller, from now on will use broker ubuntu:9092 (id: 0 rack: null) (kafka.server.BrokerToControllerRequestThread)
[2022-06-23 13:44:21,882] INFO Creating topic kafka-topic-1 with configuration {} and initial partition assignment Map(0 -> ArrayBuffer(0)) (kafka.zk.AdminZkClient)
[2022-06-23 13:44:21,951] INFO [ReplicaFetcherManager on broker 0] Removed fetcher for partitions Set(kafka-topic-1-0) (kafka.server.ReplicaFetcherManager)
[2022-06-23 13:44:21,989] INFO [LogLoader partition=kafka-topic-1-0, dir=/tmp/kafka-logs] Loading producer state till offset 0 with message format version 2 (kafka.log.UnifiedLog$)
[2022-06-23 13:44:21,996] INFO Created log for partition kafka-topic-1-0 in /tmp/kafka-logs/kafka-topic-1-0 with properties {} (kafka.log.LogManager)
[2022-06-23 13:44:21,997] INFO [Partition kafka-topic-1-0 broker=0] No checkpointed highwatermark is found for partition kafka-topic-1-0 (kafka.cluster.Partition)
[2022-06-23 13:44:21,997] INFO [Partition kafka-topic-1-0 broker=0] Log loaded for partition kafka-topic-1-0 with initial high watermark 0 (kafka.cluster.Partition)
[2022-06-23 13:47:17,089] INFO Creating topic kafka-topic-2 with configuration {} and initial partition assignment Map(2 -> ArrayBuffer(0), 1 -> ArrayBuffer(0), 0 -> ArrayBuffer(0)) (kafka.zk.AdminZkClient)
[2022-06-23 13:47:17.117] INFO [ReplicaFetcherManager on broker 0] Removed fetcher for partitions Set(kafka-topic-2-1, kafka-topic-2-0)
```

```
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0

--version                                     Display Kafka version.
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-1 --create
Created topic kafka-topic-1.
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --list
kafka-topic-1
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-1 --describe
Topic: kafka-topic-1    TopicId: 47eIxxk7SIKgHBugsNmssA PartitionCount: 1      ReplicationFactor: 1      Configs: segment.bytes=10737
41824
    Topic: kafka-topic-1    Partition: 0    Leader: 0      Replicas: 0      Isr: 0
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-2 --create --partitions 3
Created topic kafka-topic-2.
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-2 --describe
Topic: kafka-topic-2    TopicId: mxItdap7QEehKnE90ubJVQ PartitionCount: 3      ReplicationFactor: 1      Configs: segment.bytes=10737
41824
    Topic: kafka-topic-2    Partition: 0    Leader: 0      Replicas: 0      Isr: 0
    Topic: kafka-topic-2    Partition: 1    Leader: 0      Replicas: 0      Isr: 0
    Topic: kafka-topic-2    Partition: 2    Leader: 0      Replicas: 0      Isr: 0
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --describe
Topic: kafka-topic-1    TopicId: 47eIxxk7SIKgHBugsNmssA PartitionCount: 1      ReplicationFactor: 1      Configs: segment.bytes=10737
41824
    Topic: kafka-topic-1    Partition: 0    Leader: 0      Replicas: 0      Isr: 0
Topic: kafka-topic-2    TopicId: mxItdap7QEehKnE90ubJVQ PartitionCount: 3      ReplicationFactor: 1      Configs: segment.bytes=10737
41824
    Topic: kafka-topic-2    Partition: 0    Leader: 0      Replicas: 0      Isr: 0
    Topic: kafka-topic-2    Partition: 1    Leader: 0      Replicas: 0      Isr: 0
    Topic: kafka-topic-2    Partition: 2    Leader: 0      Replicas: 0      Isr: 0
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-1 --delete
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --list
kafka-topic-2
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-2 --delete
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --list
```

```
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0
itsuresha@ubuntu: ~/kafka_2.12-3.2.0

itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-1 --create
Created topic kafka-topic-1.
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-console-producer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-1
>hai
>This is test msg
>^Citsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --list
kafka-topic-1
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-console-producer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-new
>kafka2
[2022-06-23 14:09:24,500] WARN [Producer clientId=console-producer] Error while fetching metadata with correlation id 4 : {kafka-topic-new=LEADER_NOT_AVAILABLE} (org.apache.kafka.clients.NetworkClient)
>new msg
>^Citsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --list
kafka-topic-1
kafka-topic-new
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --describe
Topic: kafka-topic-1    TopicId: FItgR2o3RDCUE1YzUxkn2Q PartitionCount: 1      ReplicationFactor: 1      Configs: segment.bytes=10737
41824
    Topic: kafka-topic-1    Partition: 0    Leader: 0      Replicas: 0      Isr: 0
Topic: kafka-topic-new   TopicId: JfAe1yDoT26TVynynvEv0w PartitionCount: 1      ReplicationFactor: 1      Configs: segment.bytes=10737
41824
    Topic: kafka-topic-new   Partition: 0    Leader: 0      Replicas: 0      Isr: 0
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-console-producer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3 --create
--partitions 3
create is not a recognized option
Option          Description
-----          -----
--batch-size <Integer: size>      Number of messages to send in a single
                                         batch if they are not being sent
                                         synchronously. please note that this
                                         option will be replaced if max-
```

```

itsuresha@ubuntu: ~/kafka_2.12-3.2.0$ bin/kafka-console-producer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3
>kafka3
>kafka3
>kafka4
>kafka4
>kafka5
>kafka2
>new msg
>msg10
>msg45
itsuresha@ubuntu: ~/kafka_2.12-3.2.0$ 

```

itsuresha@ubuntu: ~/kafka\_2.12-3.2.0\$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3 --create --partitions 3

Created topic kafka-topic-3.

itsuresha@ubuntu: ~/kafka\_2.12-3.2.0\$ bin/kafka-topics.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3 --list

kafka-topic-1  
kafka-topic-new

itsuresha@ubuntu: ~/kafka\_2.12-3.2.0\$ bin/kafka-console-producer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3

>kafka3  
>kafka3  
>kafka4  
>kafka4  
>kafka5  
>kafka2  
>new msg  
>msg10  
>msg45

--sync  
--timeout <Long: timeout\_ms>  
--topic <String: topic>  
--version  
bytes` in producer configs.  
(default: 102400)  
If set message send requests to the brokers are synchronously, one at a time as they arrive.  
If set and the producer is running in asynchronous mode, this gives the maximum amount of time a message will queue awaiting sufficient batch size. The value is given in ms. This is the option to control `linger.ms` in producer configs. (default: 1000)  
REQUIRED: The topic id to produce messages to.  
Display Kafka version.

```
itsuresha@ubuntu: ~/kafka_2.1... x itsuresha@ubuntu: ~/kafka_2.1... x itsuresha@ubuntu: ~/kafka_2.1... x itsuresha@ubuntu: ~/kafka_2.1... x
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-console-consumer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3
new msg
msg10
msg45
^CProcessed a total of 3 messages
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ bin/kafka-console-consumer.sh --bootstrap-server 127.0.0.1:9092 --topic kafka-topic-3 --from-beginning
kafka3
msg10
kafka5
new msg
kafka3
kafka4
kafka2
msg45
^CProcessed a total of 8 messages
itsuresha@ubuntu:~/kafka_2.12-3.2.0$ 
```

*Q&A ?  
Thank  
You*

