



# Red Hat AMQ Streams 2.6

## Kafka configuration properties

Use configuration properties to configure Kafka components



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## Abstract

Get the most out of how Kafka components operate using Kafka configuration properties.

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## Table of Contents

<b>MAKING OPEN SOURCE MORE INCLUSIVE</b> .....	<b>3</b>
<b>CHAPTER 1. BROKER CONFIGURATION PROPERTIES</b> .....	<b>4</b>
<b>CHAPTER 2. TOPIC CONFIGURATION PROPERTIES</b> .....	<b>52</b>
<b>CHAPTER 3. CONSUMER CONFIGURATION PROPERTIES</b> .....	<b>59</b>
<b>CHAPTER 4. PRODUCER CONFIGURATION PROPERTIES</b> .....	<b>75</b>
<b>CHAPTER 5. ADMIN CLIENT CONFIGURATION PROPERTIES</b> .....	<b>91</b>
<b>CHAPTER 6. KAFKA CONNECT CONFIGURATION PROPERTIES</b> .....	<b>102</b>
<b>CHAPTER 7. KAFKA STREAMS CONFIGURATION PROPERTIES</b> .....	<b>120</b>
<b>APPENDIX A. USING YOUR SUBSCRIPTION</b> .....	<b>130</b>
Accessing Your Account	130
Activating a Subscription	130
Downloading Zip and Tar Files	130
Installing packages with DNF	130



## MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see [our CTO Chris Wright's message](#).

## CHAPTER 1. BROKER CONFIGURATION PROPERTIES

### advertised.listeners

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** per-broker

Listeners to publish to ZooKeeper for clients to use, if different than the **listeners** config property. In IaaS environments, this may need to be different from the interface to which the broker binds. If this is not set, the value for **listeners** will be used. Unlike **listeners**, it is not valid to advertise the 0.0.0.0 meta-address. Also unlike **listeners**, there can be duplicated ports in this property, so that one listener can be configured to advertise another listener's address. This can be useful in some cases where external load balancers are used.

### auto.create.topics.enable

**Type:** boolean

**Default:** true

**Importance:** high

**Dynamic update:** read-only

Enable auto creation of topic on the server.

### auto.leader.rebalance.enable

**Type:** boolean

**Default:** true

**Importance:** high

**Dynamic update:** read-only

Enables auto leader balancing. A background thread checks the distribution of partition leaders at regular intervals, configurable by `leader.imbalance.check.interval.seconds`. If the leader imbalance exceeds `leader.imbalance.per.broker.percentage`, leader rebalance to the preferred leader for partitions is triggered.

### background.threads

**Type:** int

**Default:** 10

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** cluster-wide

The number of threads to use for various background processing tasks.

### broker.id

**Type:** int

**Default:** -1

**Importance:** high

**Dynamic update:** read-only

The broker id for this server. If unset, a unique broker id will be generated. To avoid conflicts between ZooKeeper generated broker id's and user configured broker id's, generated broker ids start from `reserved.broker.max.id + 1`.

### compression.type

**Type:** string

**Default:** producer

**Valid Values:** [uncompressed, zstd, lz4, snappy, gzip, producer]



**Importance:** high

**Dynamic update:** cluster-wide

Specify the final compression type for a given topic. This configuration accepts the standard compression codecs ('gzip', 'snappy', 'lz4', 'zstd'). It additionally accepts 'uncompressed' which is equivalent to no compression; and 'producer' which means retain the original compression codec set by the producer.

### **control.plane.listener.name**

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** read-only

Name of listener used for communication between controller and brokers. A broker will use the **control.plane.listener.name** to locate the endpoint in listeners list, to listen for connections from the controller. For example, if a broker's config is: **listeners = INTERNAL://192.1.1.8:9092, EXTERNAL://10.1.1.5:9093, CONTROLLER://192.1.1.8:9094** **listener.security.protocol.map = INTERNAL:PLAINTEXT, EXTERNAL:SSL, CONTROLLER:SSL** **control.plane.listener.name = CONTROLLER** On startup, the broker will start listening on "192.1.1.8:9094" with security protocol "SSL". On the controller side, when it discovers a broker's published endpoints through ZooKeeper, it will use the **control.plane.listener.name** to find the endpoint, which it will use to establish connection to the broker. For example, if the broker's published endpoints on ZooKeeper are:

**"endpoints" :**

**["INTERNAL://broker1.example.com:9092", "EXTERNAL://broker1.example.com:9093", "CONTROLLER://broker1.example.com:9094"]** and the controller's config is:

**listener.security.protocol.map = INTERNAL:PLAINTEXT, EXTERNAL:SSL,**

**CONTROLLER:SSL** **control.plane.listener.name = CONTROLLER** then the controller will use

"broker1.example.com:9094" with security protocol "SSL" to connect to the broker. If not explicitly configured, the default value will be null and there will be no dedicated endpoints for controller connections. If explicitly configured, the value cannot be the same as the value of

**inter.broker.listener.name**.

### **controller.listener.names**

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** read-only

A comma-separated list of the names of the listeners used by the controller. This is required if running in KRaft mode. When communicating with the controller quorum, the broker will always use the first listener in this list. Note: The ZooKeeper-based controller should not set this configuration.

### **controller.quorum.election.backoff.max.ms**

**Type:** int

**Default:** 1000 (1 second)

**Importance:** high

**Dynamic update:** read-only

Maximum time in milliseconds before starting new elections. This is used in the binary exponential backoff mechanism that helps prevent gridlocked elections.

### **controller.quorum.election.timeout.ms**

**Type:** int

**Default:** 1000 (1 second)

**Importance:** high

**Dynamic update:** read-only

Maximum time in milliseconds to wait without being able to fetch from the leader before triggering a new election.

**controller.quorum.fetch.timeout.ms**

**Type:** int

**Default:** 2000 (2 seconds)

**Importance:** high

**Dynamic update:** read-only

Maximum time without a successful fetch from the current leader before becoming a candidate and triggering an election for voters; Maximum time without receiving fetch from a majority of the quorum before asking around to see if there's a new epoch for leader.

**controller.quorum.voters**

**Type:** list

**Default:** ""

**Valid Values:** non-empty list

**Importance:** high

**Dynamic update:** read-only

Map of id/endpoint information for the set of voters in a comma-separated list of **{id}@{host}:{port}** entries. For example: **1@localhost:9092,2@localhost:9093,3@localhost:9094**.

**delete.topic.enable**

**Type:** boolean

**Default:** true

**Importance:** high

**Dynamic update:** read-only

Enables delete topic. Delete topic through the admin tool will have no effect if this config is turned off.

**early.start.listeners**

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** read-only

A comma-separated list of listener names which may be started before the authorizer has finished initialization. This is useful when the authorizer is dependent on the cluster itself for bootstrapping, as is the case for the StandardAuthorizer (which stores ACLs in the metadata log.) By default, all listeners included in controller.listener.names will also be early start listeners. A listener should not appear in this list if it accepts external traffic.

**leader.imbalance.check.interval.seconds**

**Type:** long

**Default:** 300

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The frequency with which the partition rebalance check is triggered by the controller.

**leader.imbalance.per.broker.percentage**

**Type:** int

**Default:** 10

**Importance:** high

**Dynamic update:** read-only

The ratio of leader imbalance allowed per broker. The controller would trigger a leader balance if it goes above this value per broker. The value is specified in percentage.

## listeners

**Type:** string

**Default:** PLAINTEXT://:9092

**Importance:** high

**Dynamic update:** per-broker

Listener List - Comma-separated list of URIs we will listen on and the listener names. If the listener name is not a security protocol, **listener.security.protocol.map** must also be set. Listener names and port numbers must be unique unless one listener is an IPv4 address and the other listener is an IPv6 address (for the same port). Specify hostname as 0.0.0.0 to bind to all interfaces. Leave hostname empty to bind to default interface. Examples of legal listener lists:

**PLAINTEXT://myhost:9092,SSL://:9091 CLIENT://0.0.0.0:9092,REPLICATION://localhost:9093  
PLAINTEXT://127.0.0.1:9092,SSL://[:1]:9092.**

## log.dir

**Type:** string

**Default:** /tmp/kafka-logs

**Importance:** high

**Dynamic update:** read-only

The directory in which the log data is kept (supplemental for log.dirs property).

## log.dirs

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** read-only

A comma-separated list of the directories where the log data is stored. If not set, the value in log.dir is used.

## log.flush.interval.messages

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** cluster-wide

The number of messages accumulated on a log partition before messages are flushed to disk.

## log.flush.interval.ms

**Type:** long

**Default:** null

**Importance:** high

**Dynamic update:** cluster-wide

The maximum time in ms that a message in any topic is kept in memory before flushed to disk. If not set, the value in log.flush.scheduler.interval.ms is used.

## log.flush.offset.checkpoint.interval.ms

**Type:** int

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Importance:** high

**Dynamic update:** read-only

The frequency with which we update the persistent record of the last flush which acts as the log recovery point.

### **log.flush.scheduler.interval.ms**

**Type:** long

**Default:** 9223372036854775807

**Importance:** high

**Dynamic update:** read-only

The frequency in ms that the log flusher checks whether any log needs to be flushed to disk.

### **log.flush.start.offset.checkpoint.interval.ms**

**Type:** int

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Importance:** high

**Dynamic update:** read-only

The frequency with which we update the persistent record of log start offset.

### **log.retention.bytes**

**Type:** long

**Default:** -1

**Importance:** high

**Dynamic update:** cluster-wide

The maximum size of the log before deleting it.

### **log.retention.hours**

**Type:** int

**Default:** 168

**Importance:** high

**Dynamic update:** read-only

The number of hours to keep a log file before deleting it (in hours), tertiary to log.retention.ms property.

### **log.retention.minutes**

**Type:** int

**Default:** null

**Importance:** high

**Dynamic update:** read-only

The number of minutes to keep a log file before deleting it (in minutes), secondary to log.retention.ms property. If not set, the value in log.retention.hours is used.

### **log.retention.ms**

**Type:** long

**Default:** null

**Importance:** high

**Dynamic update:** cluster-wide

The number of milliseconds to keep a log file before deleting it (in milliseconds), If not set, the value in log.retention.minutes is used. If set to -1, no time limit is applied.

**log.roll.hours**

**Type:** int

**Default:** 168

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The maximum time before a new log segment is rolled out (in hours), secondary to log.roll.ms property.

**log.roll.jitter.hours**

**Type:** int

**Default:** 0

**Valid Values:** [0,...]

**Importance:** high

**Dynamic update:** read-only

The maximum jitter to subtract from logRollTimeMillis (in hours), secondary to log.roll.jitter.ms property.

**log.roll.jitter.ms**

**Type:** long

**Default:** null

**Importance:** high

**Dynamic update:** cluster-wide

The maximum jitter to subtract from logRollTimeMillis (in milliseconds). If not set, the value in log.roll.jitter.hours is used.

**log.roll.ms**

**Type:** long

**Default:** null

**Importance:** high

**Dynamic update:** cluster-wide

The maximum time before a new log segment is rolled out (in milliseconds). If not set, the value in log.roll.hours is used.

**log.segment.bytes**

**Type:** int

**Default:** 1073741824 (1 gibibyte)

**Valid Values:** [14,...]

**Importance:** high

**Dynamic update:** cluster-wide

The maximum size of a single log file.

**log.segment.delete.delay.ms**

**Type:** long

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Importance:** high

**Dynamic update:** cluster-wide

The amount of time to wait before deleting a file from the filesystem.

**message.max.bytes**

**Type:** int

**Default:** 1048588

**Valid Values:** [0,...]

**Importance:** high

**Dynamic update:** cluster-wide

The largest record batch size allowed by Kafka (after compression if compression is enabled). If this is increased and there are consumers older than 0.10.2, the consumers' fetch size must also be increased so that they can fetch record batches this large. In the latest message format version, records are always grouped into batches for efficiency. In previous message format versions, uncompressed records are not grouped into batches and this limit only applies to a single record in that case. This can be set per topic with the topic level **max.message.bytes** config.

### **metadata.log.dir**

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** read-only

This configuration determines where we put the metadata log for clusters in KRaft mode. If it is not set, the metadata log is placed in the first log directory from log.dirs.

### **metadata.log.max.record.bytes.between.snapshots**

**Type:** long

**Default:** 20971520

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

This is the maximum number of bytes in the log between the latest snapshot and the high-watermark needed before generating a new snapshot. The default value is 20971520. To generate snapshots based on the time elapsed, see the **metadata.log.max.snapshot.interval.ms** configuration. The Kafka node will generate a snapshot when either the maximum time interval is reached or the maximum bytes limit is reached.

### **metadata.log.max.snapshot.interval.ms**

**Type:** long

**Default:** 3600000 (1 hour)

**Valid Values:** [0,...]

**Importance:** high

**Dynamic update:** read-only

This is the maximum number of milliseconds to wait to generate a snapshot if there are committed records in the log that are not included in the latest snapshot. A value of zero disables time based snapshot generation. The default value is 3600000. To generate snapshots based on the number of metadata bytes, see the **metadata.log.max.record.bytes.between.snapshots** configuration. The Kafka node will generate a snapshot when either the maximum time interval is reached or the maximum bytes limit is reached.

### **metadata.log.segment.bytes**

**Type:** int

**Default:** 1073741824 (1 gibibyte)

**Valid Values:** [12,...]

**Importance:** high

**Dynamic update:** read-only

The maximum size of a single metadata log file.

**metadata.log.segment.ms****Type:** long**Default:** 604800000 (7 days)**Importance:** high**Dynamic update:** read-only

The maximum time before a new metadata log file is rolled out (in milliseconds).

**metadata.max.retention.bytes****Type:** long**Default:** 104857600 (100 mebibytes)**Importance:** high**Dynamic update:** read-only

The maximum combined size of the metadata log and snapshots before deleting old snapshots and log files. Since at least one snapshot must exist before any logs can be deleted, this is a soft limit.

**metadata.max.retention.ms****Type:** long**Default:** 604800000 (7 days)**Importance:** high**Dynamic update:** read-only

The number of milliseconds to keep a metadata log file or snapshot before deleting it. Since at least one snapshot must exist before any logs can be deleted, this is a soft limit.

**min.insync.replicas****Type:** int**Default:** 1**Valid Values:** [1,...]**Importance:** high**Dynamic update:** cluster-wide

When a producer sets acks to "all" (or "-1"), **min.insync.replicas** specifies the minimum number of replicas that must acknowledge a write for the write to be considered successful. If this minimum cannot be met, then the producer will raise an exception (either **NotEnoughReplicas** or **NotEnoughReplicasAfterAppend**). When used together, **min.insync.replicas** and acks allow you to enforce greater durability guarantees. A typical scenario would be to create a topic with a replication factor of 3, set **min.insync.replicas** to 2, and produce with acks of "all". This will ensure that the producer raises an exception if a majority of replicas do not receive a write.

**node.id****Type:** int**Default:** -1**Importance:** high**Dynamic update:** read-only

The node ID associated with the roles this process is playing when **process.roles** is non-empty. This is required configuration when running in KRaft mode.

**num.io.threads****Type:** int**Default:** 8**Valid Values:** [1,...]**Importance:** high**Dynamic update:** cluster-wide

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

**num.network.threads****Type:** int**Default:** 3**Valid Values:** [1,...]**Importance:** high**Dynamic update:** cluster-wide

The number of threads that the server uses for receiving requests from the network and sending responses to the network. Noted: each listener (except for controller listener) creates its own thread pool.

**num.recovery.threads.per.data.dir****Type:** int**Default:** 1**Valid Values:** [1,...]**Importance:** high**Dynamic update:** cluster-wide

The number of threads per data directory to be used for log recovery at startup and flushing at shutdown.

**num.replica.alter.log.dirs.threads****Type:** int**Default:** null**Importance:** high**Dynamic update:** read-only

The number of threads that can move replicas between log directories, which may include disk I/O.

**num.replica.fetchers****Type:** int**Default:** 1**Importance:** high**Dynamic update:** cluster-wide

Number of fetcher threads used to replicate records from each source broker. The total number of fetchers on each broker is bound by **num.replica.fetchers** multiplied by the number of brokers in the cluster. Increasing this value can increase the degree of I/O parallelism in the follower and leader broker at the cost of higher CPU and memory utilization.

**offset.metadata.max.bytes****Type:** int**Default:** 4096 (4 kibibytes)**Importance:** high**Dynamic update:** read-only

The maximum size for a metadata entry associated with an offset commit.

**offsets.commit.required.acks****Type:** short**Default:** -1**Importance:** high**Dynamic update:** read-only

The required acks before the commit can be accepted. In general, the default (-1) should not be overridden.

**offsets.commit.timeout.ms**



**Type:** int

**Default:** 5000 (5 seconds)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

Offset commit will be delayed until all replicas for the offsets topic receive the commit or this timeout is reached. This is similar to the producer request timeout.

### **offsets.load.buffer.size**

**Type:** int

**Default:** 5242880

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

Batch size for reading from the offsets segments when loading offsets into the cache (soft-limit, overridden if records are too large).

### **offsets.retention.check.interval.ms**

**Type:** long

**Default:** 600000 (10 minutes)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

Frequency at which to check for stale offsets.

### **offsets.retention.minutes**

**Type:** int

**Default:** 10080

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

For subscribed consumers, committed offset of a specific partition will be expired and discarded when 1) this retention period has elapsed after the consumer group loses all its consumers (i.e. becomes empty); 2) this retention period has elapsed since the last time an offset is committed for the partition and the group is no longer subscribed to the corresponding topic. For standalone consumers (using manual assignment), offsets will be expired after this retention period has elapsed since the time of last commit. Note that when a group is deleted via the delete-group request, its committed offsets will also be deleted without extra retention period; also when a topic is deleted via the delete-topic request, upon propagated metadata update any group's committed offsets for that topic will also be deleted without extra retention period.

### **offsets.topic.compression.codec**

**Type:** int

**Default:** 0

**Importance:** high

**Dynamic update:** read-only

Compression codec for the offsets topic - compression may be used to achieve "atomic" commits.

### **offsets.topic.num.partitions**

**Type:** int

**Default:** 50

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The number of partitions for the offset commit topic (should not change after deployment).

### **offsets.topic.replication.factor**

**Type:** short

**Default:** 3

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The replication factor for the offsets topic (set higher to ensure availability). Internal topic creation will fail until the cluster size meets this replication factor requirement.

### **offsets.topic.segment.bytes**

**Type:** int

**Default:** 104857600 (100 mebibytes)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The offsets topic segment bytes should be kept relatively small in order to facilitate faster log compaction and cache loads.

### **process.roles**

**Type:** list

**Default:** ""

**Valid Values:** [broker, controller]

**Importance:** high

**Dynamic update:** read-only

The roles that this process plays: 'broker', 'controller', or 'broker,controller' if it is both. This configuration is only applicable for clusters in KRaft (Kafka Raft) mode (instead of ZooKeeper). Leave this config undefined or empty for ZooKeeper clusters.

### **queued.max.requests**

**Type:** int

**Default:** 500

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The number of queued requests allowed for data-plane, before blocking the network threads.

### **replica.fetch.min.bytes**

**Type:** int

**Default:** 1

**Importance:** high

**Dynamic update:** read-only

Minimum bytes expected for each fetch response. If not enough bytes, wait up to **replica.fetch.wait.max.ms** (broker config).

### **replica.fetch.wait.max.ms**

**Type:** int

**Default:** 500

**Importance:** high

**Dynamic update:** read-only

The maximum wait time for each fetcher request issued by follower replicas. This value should always be less than the `replica.lag.time.max.ms` at all times to prevent frequent shrinking of ISR for low throughput topics.

### **replica.high.watermark.checkpoint.interval.ms**

**Type:** long

**Default:** 5000 (5 seconds)

**Importance:** high

**Dynamic update:** read-only

The frequency with which the high watermark is saved out to disk.

### **replica.lag.time.max.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Importance:** high

**Dynamic update:** read-only

If a follower hasn't sent any fetch requests or hasn't consumed up to the leader's log end offset for at least this time, the leader will remove the follower from ISR.

### **replica.socket.receive.buffer.bytes**

**Type:** int

**Default:** 65536 (64 kibibytes)

**Importance:** high

**Dynamic update:** read-only

The socket receive buffer for network requests to the leader for replicating data.

### **replica.socket.timeout.ms**

**Type:** int

**Default:** 30000 (30 seconds)

**Importance:** high

**Dynamic update:** read-only

The socket timeout for network requests. Its value should be at least `replica.fetch.wait.max.ms`.

### **request.timeout.ms**

**Type:** int

**Default:** 30000 (30 seconds)

**Importance:** high

**Dynamic update:** read-only

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted.

### **sasl.mechanism.controller.protocol**

**Type:** string

**Default:** GSSAPI

**Importance:** high

**Dynamic update:** read-only

SASL mechanism used for communication with controllers. Default is GSSAPI.

### **socket.receive.buffer.bytes**

**Type:** int

**Default:** 102400 (100 kibibytes)

**Importance:** high

**Dynamic update:** read-only

The SO\_RCVBUF buffer of the socket server sockets. If the value is -1, the OS default will be used.

### **socket.request.max.bytes**

**Type:** int

**Default:** 104857600 (100 mebibytes)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The maximum number of bytes in a socket request.

### **socket.send.buffer.bytes**

**Type:** int

**Default:** 102400 (100 kibibytes)

**Importance:** high

**Dynamic update:** read-only

The SO\_SNDBUF buffer of the socket server sockets. If the value is -1, the OS default will be used.

### **transaction.max.timeout.ms**

**Type:** int

**Default:** 900000 (15 minutes)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The maximum allowed timeout for transactions. If a client's requested transaction time exceed this, then the broker will return an error in InitProducerIdRequest. This prevents a client from too large of a timeout, which can stall consumers reading from topics included in the transaction.

### **transaction.state.log.load.buffer.size**

**Type:** int

**Default:** 5242880

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

Batch size for reading from the transaction log segments when loading producer ids and transactions into the cache (soft-limit, overridden if records are too large).

### **transaction.state.log.min.isr**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

Overridden min.insync.replicas config for the transaction topic.

### **transaction.state.log.num.partitions**

**Type:** int

**Default:** 50

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The number of partitions for the transaction topic (should not change after deployment).

### **transaction.state.log.replication.factor**

**Type:** short

**Default:** 3

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The replication factor for the transaction topic (set higher to ensure availability). Internal topic creation will fail until the cluster size meets this replication factor requirement.

### **transaction.state.log.segment.bytes**

**Type:** int

**Default:** 104857600 (100 mebibytes)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The transaction topic segment bytes should be kept relatively small in order to facilitate faster log compaction and cache loads.

### **transactional.id.expiration.ms**

**Type:** int

**Default:** 604800000 (7 days)

**Valid Values:** [1,...]

**Importance:** high

**Dynamic update:** read-only

The time in ms that the transaction coordinator will wait without receiving any transaction status updates for the current transaction before expiring its transactional id. Transactional IDs will not expire while a the transaction is still ongoing.

### **unclean.leader.election.enable**

**Type:** boolean

**Default:** false

**Importance:** high

**Dynamic update:** cluster-wide

Indicates whether to enable replicas not in the ISR set to be elected as leader as a last resort, even though doing so may result in data loss.

### **zookeeper.connect**

**Type:** string

**Default:** null

**Importance:** high

**Dynamic update:** read-only

Specifies the ZooKeeper connection string in the form **hostname:port** where host and port are the host and port of a ZooKeeper server. To allow connecting through other ZooKeeper nodes when that ZooKeeper machine is down you can also specify multiple hosts in the form

**hostname1:port1,hostname2:port2,hostname3:port3**. The server can also have a ZooKeeper chroot path as part of its ZooKeeper connection string which puts its data under some path in the global ZooKeeper namespace. For example to give a chroot path of **/chroot/path** you would give the connection string as **hostname1:port1,hostname2:port2,hostname3:port3/chroot/path**.

**zookeeper.connection.timeout.ms****Type:** int**Default:** null**Importance:** high**Dynamic update:** read-only

The max time that the client waits to establish a connection to ZooKeeper. If not set, the value in `zookeeper.session.timeout.ms` is used.

**zookeeper.max.in.flight.requests****Type:** int**Default:** 10**Valid Values:** [1,...]**Importance:** high**Dynamic update:** read-only

The maximum number of unacknowledged requests the client will send to ZooKeeper before blocking.

**zookeeper.metadata.migration.enable****Type:** boolean**Default:** false**Importance:** high**Dynamic update:** read-only

Enable ZK to KRaft migration.

**zookeeper.session.timeout.ms****Type:** int**Default:** 18000 (18 seconds)**Importance:** high**Dynamic update:** read-only

Zookeeper session timeout.

**zookeeper.set.acl****Type:** boolean**Default:** false**Importance:** high**Dynamic update:** read-only

Set client to use secure ACLs.

**broker.heartbeat.interval.ms****Type:** int**Default:** 2000 (2 seconds)**Importance:** medium**Dynamic update:** read-only

The length of time in milliseconds between broker heartbeats. Used when running in KRaft mode.

**broker.id.generation.enable****Type:** boolean**Default:** true**Importance:** medium**Dynamic update:** read-only

Enable automatic broker id generation on the server. When enabled the value configured for `reserved.broker.max.id` should be reviewed.

### **broker.rack**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Rack of the broker. This will be used in rack aware replication assignment for fault tolerance.

Examples: **RACK1**, **us-east-1d**.

### **broker.session.timeout.ms**

**Type:** int

**Default:** 9000 (9 seconds)

**Importance:** medium

**Dynamic update:** read-only

The length of time in milliseconds that a broker lease lasts if no heartbeats are made. Used when running in KRaft mode.

### **connections.max.idle.ms**

**Type:** long

**Default:** 600000 (10 minutes)

**Importance:** medium

**Dynamic update:** read-only

Idle connections timeout: the server socket processor threads close the connections that idle more than this.

### **connections.max.reauth.ms**

**Type:** long

**Default:** 0

**Importance:** medium

**Dynamic update:** read-only

When explicitly set to a positive number (the default is 0, not a positive number), a session lifetime that will not exceed the configured value will be communicated to v2.2.0 or later clients when they authenticate. The broker will disconnect any such connection that is not re-authenticated within the session lifetime and that is then subsequently used for any purpose other than re-authentication. Configuration names can optionally be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.oauthbearer.connections.max.reauth.ms=3600000`.

### **controlled.shutdown.enable**

**Type:** boolean

**Default:** true

**Importance:** medium

**Dynamic update:** read-only

Enable controlled shutdown of the server.

### **controlled.shutdown.max.retries**

**Type:** int

**Default:** 3

**Importance:** medium

**Dynamic update:** read-only

Controlled shutdown can fail for multiple reasons. This determines the number of retries when such failure happens.

**controlled.shutdown.retry.backoff.ms**

**Type:** long

**Default:** 5000 (5 seconds)

**Importance:** medium

**Dynamic update:** read-only

Before each retry, the system needs time to recover from the state that caused the previous failure (Controller fail over, replica lag etc). This config determines the amount of time to wait before retrying.

**controller.quorum.append.linger.ms**

**Type:** int

**Default:** 25

**Importance:** medium

**Dynamic update:** read-only

The duration in milliseconds that the leader will wait for writes to accumulate before flushing them to disk.

**controller.quorum.request.timeout.ms**

**Type:** int

**Default:** 2000 (2 seconds)

**Importance:** medium

**Dynamic update:** read-only

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted.

**controller.socket.timeout.ms**

**Type:** int

**Default:** 30000 (30 seconds)

**Importance:** medium

**Dynamic update:** read-only

The socket timeout for controller-to-broker channels.

**default.replication.factor**

**Type:** int

**Default:** 1

**Importance:** medium

**Dynamic update:** read-only

The default replication factors for automatically created topics.

**delegation.token.expiry.time.ms**

**Type:** long

**Default:** 86400000 (1 day)

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

The token validity time in milliseconds before the token needs to be renewed. Default value 1 day.

**delegation.token.master.key**



**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

DEPRECATED: An alias for `delegation.token.secret.key`, which should be used instead of this config.

### **delegation.token.max.lifetime.ms**

**Type:** long

**Default:** 604800000 (7 days)

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

The token has a maximum lifetime beyond which it cannot be renewed anymore. Default value 7 days.

### **delegation.token.secret.key**

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Secret key to generate and verify delegation tokens. The same key must be configured across all the brokers. If using Kafka with KRaft, the key must also be set across all controllers. If the key is not set or set to empty string, brokers will disable the delegation token support.

### **delete.records.purgatory.purge.interval.requests**

**Type:** int

**Default:** 1

**Importance:** medium

**Dynamic update:** read-only

The purge interval (in number of requests) of the delete records request purgatory.

### **fetch.max.bytes**

**Type:** int

**Default:** 57671680 (55 mebibytes)

**Valid Values:** [1024,...]

**Importance:** medium

**Dynamic update:** read-only

The maximum number of bytes we will return for a fetch request. Must be at least 1024.

### **fetch.purgatory.purge.interval.requests**

**Type:** int

**Default:** 1000

**Importance:** medium

**Dynamic update:** read-only

The purge interval (in number of requests) of the fetch request purgatory.

### **group.initial.rebalance.delay.ms**

**Type:** int

**Default:** 3000 (3 seconds)

**Importance:** medium

**Dynamic update:** read-only

The amount of time the group coordinator will wait for more consumers to join a new group before performing the first rebalance. A longer delay means potentially fewer rebalances, but increases the time until processing begins.

**group.max.session.timeout.ms**

**Type:** int

**Default:** 1800000 (30 minutes)

**Importance:** medium

**Dynamic update:** read-only

The maximum allowed session timeout for registered consumers. Longer timeouts give consumers more time to process messages in between heartbeats at the cost of a longer time to detect failures.

**group.max.size**

**Type:** int

**Default:** 2147483647

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

The maximum number of consumers that a single consumer group can accommodate.

**group.min.session.timeout.ms**

**Type:** int

**Default:** 6000 (6 seconds)

**Importance:** medium

**Dynamic update:** read-only

The minimum allowed session timeout for registered consumers. Shorter timeouts result in quicker failure detection at the cost of more frequent consumer heartbeating, which can overwhelm broker resources.

**initial.broker.registration.timeout.ms**

**Type:** int

**Default:** 60000 (1 minute)

**Importance:** medium

**Dynamic update:** read-only

When initially registering with the controller quorum, the number of milliseconds to wait before declaring failure and exiting the broker process.

**inter.broker.listener.name**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Name of listener used for communication between brokers. If this is unset, the listener name is defined by `security.inter.broker.protocol`. It is an error to set this and `security.inter.broker.protocol` properties at the same time.

**inter.broker.protocol.version**

**Type:** string

**Default:** 3.6-IV2

**Valid Values:** [0.8.0, 0.8.1, 0.8.2, 0.9.0, 0.10.0-IV0, 0.10.0-IV1, 0.10.1-IV0, 0.10.1-IV1, 0.10.1-IV2, 0.10.2-IV0, 0.11.0-IV0, 0.11.0-IV1, 0.11.0-IV2, 1.0-IV0, 1.1-IV0, 2.0-IV0, 2.0-IV1, 2.1-IV0, 2.1-IV1, 2.1-IV2, 2.2-IV0, 2.2-IV1, 2.3-IV0, 2.3-IV1, 2.4-IV0, 2.4-IV1, 2.5-IV0, 2.6-IV0, 2.7-IV0, 2.7-IV1, 2.7-IV2, 2.8-IV0, 2.8-IV1,

3.0-IV0, 3.0-IV1, 3.1-IV0, 3.2-IV0, 3.3-IV0, 3.3-IV1, 3.3-IV2, 3.3-IV3, 3.4-IV0, 3.5-IV0, 3.5-IV1, 3.5-IV2, 3.6-IV0, 3.6-IV1, 3.6-IV2]

**Importance:** medium

**Dynamic update:** read-only

Specify which version of the inter-broker protocol will be used. This is typically bumped after all brokers were upgraded to a new version. Example of some valid values are: 0.8.0, 0.8.1, 0.8.1.1, 0.8.2, 0.8.2.0, 0.8.2.1, 0.9.0.0, 0.9.0.1 Check MetadataVersion for the full list.

### **log.cleaner.backoff.ms**

**Type:** long

**Default:** 15000 (15 seconds)

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The amount of time to sleep when there are no logs to clean.

### **log.cleaner.dedupe.buffer.size**

**Type:** long

**Default:** 134217728

**Importance:** medium

**Dynamic update:** cluster-wide

The total memory used for log deduplication across all cleaner threads.

### **log.cleaner.delete.retention.ms**

**Type:** long

**Default:** 86400000 (1 day)

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The amount of time to retain tombstone message markers for log compacted topics. This setting also gives a bound on the time in which a consumer must complete a read if they begin from offset 0 to ensure that they get a valid snapshot of the final stage (otherwise tombstones messages may be collected before a consumer completes their scan).

### **log.cleaner.enable**

**Type:** boolean

**Default:** true

**Importance:** medium

**Dynamic update:** read-only

Enable the log cleaner process to run on the server. Should be enabled if using any topics with a cleanup.policy=compact including the internal offsets topic. If disabled those topics will not be compacted and continually grow in size.

### **log.cleaner.io.buffer.load.factor**

**Type:** double

**Default:** 0.9

**Importance:** medium

**Dynamic update:** cluster-wide

Log cleaner dedupe buffer load factor. The percentage full the dedupe buffer can become. A higher value will allow more log to be cleaned at once but will lead to more hash collisions.

### **log.cleaner.io.buffer.size**

**Type:** int

**Default:** 524288

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The total memory used for log cleaner I/O buffers across all cleaner threads.

### **log.cleaner.io.max.bytes.per.second**

**Type:** double

**Default:** 1.7976931348623157E308

**Importance:** medium

**Dynamic update:** cluster-wide

The log cleaner will be throttled so that the sum of its read and write i/o will be less than this value on average.

### **log.cleaner.max.compaction.lag.ms**

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The maximum time a message will remain ineligible for compaction in the log. Only applicable for logs that are being compacted.

### **log.cleaner.min.cleanable.ratio**

**Type:** double

**Default:** 0.5

**Valid Values:** [0,...,1]

**Importance:** medium

**Dynamic update:** cluster-wide

The minimum ratio of dirty log to total log for a log to eligible for cleaning. If the `log.cleaner.max.compaction.lag.ms` or the `log.cleaner.min.compaction.lag.ms` configurations are also specified, then the log compactor considers the log eligible for compaction as soon as either: (i) the dirty ratio threshold has been met and the log has had dirty (uncompacted) records for at least the `log.cleaner.min.compaction.lag.ms` duration, or (ii) if the log has had dirty (uncompacted) records for at most the `log.cleaner.max.compaction.lag.ms` period.

### **log.cleaner.min.compaction.lag.ms**

**Type:** long

**Default:** 0

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The minimum time a message will remain uncompacted in the log. Only applicable for logs that are being compacted.

### **log.cleaner.threads**

**Type:** int

**Default:** 1

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The number of background threads to use for log cleaning.

### **log.cleanup.policy**

**Type:** list

**Default:** delete

**Valid Values:** [compact, delete]

**Importance:** medium

**Dynamic update:** cluster-wide

The default cleanup policy for segments beyond the retention window. A comma separated list of valid policies. Valid policies are: "delete" and "compact".

### **log.index.interval.bytes**

**Type:** int

**Default:** 4096 (4 kibibytes)

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The interval with which we add an entry to the offset index.

### **log.index.size.max.bytes**

**Type:** int

**Default:** 10485760 (10 mebibytes)

**Valid Values:** [4,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The maximum size in bytes of the offset index.

### **log.local.retention.bytes**

**Type:** long

**Default:** -2

**Valid Values:** [-2,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The maximum size of local log segments that can grow for a partition before it gets eligible for deletion. Default value is -2, it represents **log.retention.bytes** value to be used. The effective value should always be less than or equal to **log.retention.bytes** value.

### **log.local.retention.ms**

**Type:** long

**Default:** -2

**Valid Values:** [-2,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The number of milliseconds to keep the local log segments before it gets eligible for deletion. Default value is -2, it represents **log.retention.ms** value is to be used. The effective value should always be less than or equal to **log.retention.ms** value.

### **log.message.format.version**

**Type:** string

**Default:** 3.0-IV1

**Valid Values:** [0.8.0, 0.8.1, 0.8.2, 0.9.0, 0.10.0-IV0, 0.10.0-IV1, 0.10.1-IV0, 0.10.1-IV1, 0.10.1-IV2, 0.10.2-IV0, 0.11.0-IV0, 0.11.0-IV1, 0.11.0-IV2, 1.0-IV0, 1.1-IV0, 2.0-IV0, 2.0-IV1, 2.1-IV0, 2.1-IV1, 2.1-IV2, 2.2-IV0,

2.2-IV1, 2.3-IV0, 2.3-IV1, 2.4-IV0, 2.4-IV1, 2.5-IV0, 2.6-IV0, 2.7-IV0, 2.7-IV1, 2.7-IV2, 2.8-IV0, 2.8-IV1, 3.0-IV0, 3.0-IV1, 3.1-IV0, 3.2-IV0, 3.3-IV0, 3.3-IV1, 3.3-IV2, 3.3-IV3, 3.4-IV0, 3.5-IV0, 3.5-IV1, 3.5-IV2, 3.6-IV0, 3.6-IV1, 3.6-IV2]

**Importance:** medium

**Dynamic update:** read-only

Specify the message format version the broker will use to append messages to the logs. The value should be a valid `MetadataVersion`. Some examples are: 0.8.2, 0.9.0.0, 0.10.0, check `MetadataVersion` for more details. By setting a particular message format version, the user is certifying that all the existing messages on disk are smaller or equal than the specified version. Setting this value incorrectly will cause consumers with older versions to break as they will receive messages with a format that they don't understand.

### **log.message.timestamp.after.max.ms**

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

This configuration sets the allowable timestamp difference between the message timestamp and the broker's timestamp. The message timestamp can be later than or equal to the broker's timestamp, with the maximum allowable difference determined by the value set in this configuration. If `log.message.timestamp.type=CreateTime`, the message will be rejected if the difference in timestamps exceeds this specified threshold. This configuration is ignored if `log.message.timestamp.type=LogAppendTime`.

### **log.message.timestamp.before.max.ms**

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

This configuration sets the allowable timestamp difference between the broker's timestamp and the message timestamp. The message timestamp can be earlier than or equal to the broker's timestamp, with the maximum allowable difference determined by the value set in this configuration. If `log.message.timestamp.type=CreateTime`, the message will be rejected if the difference in timestamps exceeds this specified threshold. This configuration is ignored if `log.message.timestamp.type=LogAppendTime`.

### **log.message.timestamp.difference.max.ms**

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

[DEPRECATED] The maximum difference allowed between the timestamp when a broker receives a message and the timestamp specified in the message. If `log.message.timestamp.type=CreateTime`, a message will be rejected if the difference in timestamp exceeds this threshold. This configuration is ignored if `log.message.timestamp.type=LogAppendTime`. The maximum timestamp difference allowed should be no greater than `log.retention.ms` to avoid unnecessarily frequent log rolling.

### **log.message.timestamp.type**

**Type:** string

**Default:** CreateTime

**Valid Values:** [CreateTime, LogAppendTime]

**Importance:** medium

**Dynamic update:** cluster-wide

Define whether the timestamp in the message is message create time or log append time. The value should be either **CreateTime** or **LogAppendTime**.

### log.preallocate

**Type:** boolean

**Default:** false

**Importance:** medium

**Dynamic update:** cluster-wide

Should pre allocate file when create new segment? If you are using Kafka on Windows, you probably need to set it to true.

### log.retention.check.interval.ms

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

The frequency in milliseconds that the log cleaner checks whether any log is eligible for deletion.

### max.connection.creation.rate

**Type:** int

**Default:** 2147483647

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The maximum connection creation rate we allow in the broker at any time. Listener-level limits may also be configured by prefixing the config name with the listener prefix, for example, **listener.name.internal.max.connection.creation.rate**. Broker-wide connection rate limit should be configured based on broker capacity while listener limits should be configured based on application requirements. New connections will be throttled if either the listener or the broker limit is reached, with the exception of inter-broker listener. Connections on the inter-broker listener will be throttled only when the listener-level rate limit is reached.

### max.connections

**Type:** int

**Default:** 2147483647

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The maximum number of connections we allow in the broker at any time. This limit is applied in addition to any per-ip limits configured using `max.connections.per.ip`. Listener-level limits may also be configured by prefixing the config name with the listener prefix, for example, **listener.name.internal.max.connections**. Broker-wide limit should be configured based on broker capacity while listener limits should be configured based on application requirements. New connections are blocked if either the listener or broker limit is reached. Connections on the inter-broker listener are permitted even if broker-wide limit is reached. The least recently used connection on another listener will be closed in this case.

### max.connections.per.ip

**Type:** int

**Default:** 2147483647

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** cluster-wide

The maximum number of connections we allow from each ip address. This can be set to 0 if there are overrides configured using `max.connections.per.ip.overrides` property. New connections from the ip address are dropped if the limit is reached.

### **max.connections.per.ip.overrides**

**Type:** string

**Default:** ""

**Importance:** medium

**Dynamic update:** cluster-wide

A comma-separated list of per-ip or hostname overrides to the default maximum number of connections. An example value is "hostName:100,127.0.0.1:200".

### **max.incremental.fetch.session.cache.slots**

**Type:** int

**Default:** 1000

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** read-only

The maximum number of incremental fetch sessions that we will maintain.

### **num.partitions**

**Type:** int

**Default:** 1

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

The default number of log partitions per topic.

### **password.encoder.old.secret**

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The old secret that was used for encoding dynamically configured passwords. This is required only when the secret is updated. If specified, all dynamically encoded passwords are decoded using this old secret and re-encoded using `password.encoder.secret` when broker starts up.

### **password.encoder.secret**

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The secret used for encoding dynamically configured passwords for this broker.

### **principal.builder.class**

**Type:** class

**Default:** org.apache.kafka.common.security.authenticator.DefaultKafkaPrincipalBuilder

**Importance:** medium



**Dynamic update:** per-broker

The fully qualified name of a class that implements the `KafkaPrincipalBuilder` interface, which is used to build the `KafkaPrincipal` object used during authorization. If no principal builder is defined, the default behavior depends on the security protocol in use. For SSL authentication, the principal will be derived using the rules defined by **`ssl.principal.mapping.rules`** applied on the distinguished name from the client certificate if one is provided; otherwise, if client authentication is not required, the principal name will be `ANONYMOUS`. For SASL authentication, the principal will be derived using the rules defined by **`sasl.kerberos.principal.to.local.rules`** if GSSAPI is in use, and the SASL authentication ID for other mechanisms. For `PLAINTEXT`, the principal will be `ANONYMOUS`.

### **`producer.purgatory.purge.interval.requests`**

**Type:** int

**Default:** 1000

**Importance:** medium

**Dynamic update:** read-only

The purge interval (in number of requests) of the producer request purgatory.

### **`queued.max.request.bytes`**

**Type:** long

**Default:** -1

**Importance:** medium

**Dynamic update:** read-only

The number of queued bytes allowed before no more requests are read.

### **`remote.log.manager.thread.pool.size`**

**Type:** int

**Default:** 10

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

Size of the thread pool used in scheduling tasks to copy segments, fetch remote log indexes and clean up remote log segments.

### **`remote.log.metadata.manager.class.name`**

**Type:** string

**Default:**

`org.apache.kafka.server.log.remote.metadata.storage.TopicBasedRemoteLogMetadataManager`

**Valid Values:** non-empty string

**Importance:** medium

**Dynamic update:** read-only

Fully qualified class name of **`RemoteLogMetadataManager`** implementation.

### **`remote.log.metadata.manager.class.path`**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Class path of the **`RemoteLogMetadataManager`** implementation. If specified, the `RemoteLogMetadataManager` implementation and its dependent libraries will be loaded by a dedicated classloader which searches this class path before the Kafka broker class path. The syntax of this parameter is same as the standard Java class path string.

**remote.log.metadata.manager.impl.prefix**

**Type:** string

**Default:** rlmm.config.

**Valid Values:** non-empty string

**Importance:** medium

**Dynamic update:** read-only

Prefix used for properties to be passed to RemoteLogMetadataManager implementation. For example this value can be **rlmm.config**.

**remote.log.metadata.manager.listener.name**

**Type:** string

**Default:** null

**Valid Values:** non-empty string

**Importance:** medium

**Dynamic update:** read-only

Listener name of the local broker to which it should get connected if needed by RemoteLogMetadataManager implementation.

**remote.log.reader.max.pending.tasks**

**Type:** int

**Default:** 100

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

Maximum remote log reader thread pool task queue size. If the task queue is full, fetch requests are served with an error.

**remote.log.reader.threads**

**Type:** int

**Default:** 10

**Valid Values:** [1,...]

**Importance:** medium

**Dynamic update:** read-only

Size of the thread pool that is allocated for handling remote log reads.

**remote.log.storage.manager.class.name**

**Type:** string

**Default:** null

**Valid Values:** non-empty string

**Importance:** medium

**Dynamic update:** read-only

Fully qualified class name of **RemoteStorageManager** implementation.

**remote.log.storage.manager.class.path**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Class path of the **RemoteStorageManager** implementation. If specified, the RemoteStorageManager implementation and its dependent libraries will be loaded by a dedicated classloader which searches this class path before the Kafka broker class path. The syntax of this parameter is same as the standard Java class path string.

**remote.log.storage.manager.impl.prefix**

**Type:** string

**Default:** rsm.config.

**Valid Values:** non-empty string

**Importance:** medium

**Dynamic update:** read-only

Prefix used for properties to be passed to RemoteStorageManager implementation. For example this value can be **rsm.config..**

**remote.log.storage.system.enable**

**Type:** boolean

**Default:** false

**Importance:** medium

**Dynamic update:** read-only

Whether to enable tiered storage functionality in a broker or not. Valid values are **true** or **false** and the default value is false. When it is true broker starts all the services required for the tiered storage functionality.

**replica.fetch.backoff.ms**

**Type:** int

**Default:** 1000 (1 second)

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** read-only

The amount of time to sleep when fetch partition error occurs.

**replica.fetch.max.bytes**

**Type:** int

**Default:** 1048576 (1 mebibyte)

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** read-only

The number of bytes of messages to attempt to fetch for each partition. This is not an absolute maximum, if the first record batch in the first non-empty partition of the fetch is larger than this value, the record batch will still be returned to ensure that progress can be made. The maximum record batch size accepted by the broker is defined via **message.max.bytes** (broker config) or **max.message.bytes** (topic config).

**replica.fetch.response.max.bytes**

**Type:** int

**Default:** 10485760 (10 mebibytes)

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** read-only

Maximum bytes expected for the entire fetch response. Records are fetched in batches, and if the first record batch in the first non-empty partition of the fetch is larger than this value, the record batch will still be returned to ensure that progress can be made. As such, this is not an absolute maximum. The maximum record batch size accepted by the broker is defined via **message.max.bytes** (broker config) or **max.message.bytes** (topic config).

**replica.selector.class**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The fully qualified class name that implements ReplicaSelector. This is used by the broker to find the preferred read replica. By default, we use an implementation that returns the leader.

### **reserved.broker.max.id**

**Type:** int

**Default:** 1000

**Valid Values:** [0,...]

**Importance:** medium

**Dynamic update:** read-only

Max number that can be used for a broker.id.

### **sasl.client.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The fully qualified name of a SASL client callback handler class that implements the AuthenticateCallbackHandler interface.

### **sasl.enabled.mechanisms**

**Type:** list

**Default:** GSSAPI

**Importance:** medium

**Dynamic update:** per-broker

The list of SASL mechanisms enabled in the Kafka server. The list may contain any mechanism for which a security provider is available. Only GSSAPI is enabled by default.

### **sasl.jaas.config**

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** per-broker

JAAS login context parameters for SASL connections in the format used by JAAS configuration files. JAAS configuration file format is described [here](#). The format for the value is: **loginModuleClass controlFlag (optionName=optionValue)\***; For brokers, the config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.jaas.config=com.example.ScramLoginModule required;

### **sasl.kerberos.kinit.cmd**

**Type:** string

**Default:** /usr/bin/kinit

**Importance:** medium

**Dynamic update:** per-broker

Kerberos kinit command path.

### **sasl.kerberos.min.time.before.relogin**

**Type:** long

**Default:** 60000

**Importance:** medium

**Dynamic update:** per-broker  
Login thread sleep time between refresh attempts.

### **sasl.kerberos.principal.to.local.rules**

**Type:** list  
**Default:** DEFAULT  
**Importance:** medium  
**Dynamic update:** per-broker

A list of rules for mapping from principal names to short names (typically operating system usernames). The rules are evaluated in order and the first rule that matches a principal name is used to map it to a short name. Any later rules in the list are ignored. By default, principal names of the form **{username}/{hostname}@{REALM}** are mapped to **{username}**. For more details on the format please see [security authorization and acls](#). Note that this configuration is ignored if an extension of **KafkaPrincipalBuilder** is provided by the **principal.builder.class** configuration.

### **sasl.kerberos.service.name**

**Type:** string  
**Default:** null  
**Importance:** medium  
**Dynamic update:** per-broker

The Kerberos principal name that Kafka runs as. This can be defined either in Kafka's JAAS config or in Kafka's config.

### **sasl.kerberos.ticket.renew.jitter**

**Type:** double  
**Default:** 0.05  
**Importance:** medium  
**Dynamic update:** per-broker  
Percentage of random jitter added to the renewal time.

### **sasl.kerberos.ticket.renew.window.factor**

**Type:** double  
**Default:** 0.8  
**Importance:** medium  
**Dynamic update:** per-broker  
Login thread will sleep until the specified window factor of time from last refresh to ticket's expiry has been reached, at which time it will try to renew the ticket.

### **sasl.login.callback.handler.class**

**Type:** class  
**Default:** null  
**Importance:** medium  
**Dynamic update:** read-only

The fully qualified name of a SASL login callback handler class that implements the `AuthenticateCallbackHandler` interface. For brokers, login callback handler config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.login.callback.handler.class=com.example.CustomScramLoginCallbackHandler`.

### **sasl.login.class**

**Type:** class  
**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The fully qualified name of a class that implements the Login interface. For brokers, login config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.login.class=com.example.CustomScramLogin`.

### **sasl.login.refresh.buffer.seconds**

**Type:** short

**Default:** 300

**Importance:** medium

**Dynamic update:** per-broker

The amount of buffer time before credential expiration to maintain when refreshing a credential, in seconds. If a refresh would otherwise occur closer to expiration than the number of buffer seconds then the refresh will be moved up to maintain as much of the buffer time as possible. Legal values are between 0 and 3600 (1 hour); a default value of 300 (5 minutes) is used if no value is specified. This value and `sasl.login.refresh.min.period.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.min.period.seconds**

**Type:** short

**Default:** 60

**Importance:** medium

**Dynamic update:** per-broker

The desired minimum time for the login refresh thread to wait before refreshing a credential, in seconds. Legal values are between 0 and 900 (15 minutes); a default value of 60 (1 minute) is used if no value is specified. This value and `sasl.login.refresh.buffer.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.window.factor**

**Type:** double

**Default:** 0.8

**Importance:** medium

**Dynamic update:** per-broker

Login refresh thread will sleep until the specified window factor relative to the credential's lifetime has been reached, at which time it will try to refresh the credential. Legal values are between 0.5 (50%) and 1.0 (100%) inclusive; a default value of 0.8 (80%) is used if no value is specified. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.window.jitter**

**Type:** double

**Default:** 0.05

**Importance:** medium

**Dynamic update:** per-broker

The maximum amount of random jitter relative to the credential's lifetime that is added to the login refresh thread's sleep time. Legal values are between 0 and 0.25 (25%) inclusive; a default value of 0.05 (5%) is used if no value is specified. Currently applies only to OAUTHBEARER.

### **sasl.mechanism.inter.broker.protocol**

**Type:** string

**Default:** GSSAPI

**Importance:** medium

**Dynamic update:** per-broker

SASL mechanism used for inter-broker communication. Default is GSSAPI.

### **sasl.oauthbearer.jwks.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The OAuth/OIDC provider URL from which the provider's [JWKS \(JSON Web Key Set\)](#) can be retrieved. The URL can be HTTP(S)-based or file-based. If the URL is HTTP(S)-based, the JWKS data will be retrieved from the OAuth/OIDC provider via the configured URL on broker startup. All then-current keys will be cached on the broker for incoming requests. If an authentication request is received for a JWT that includes a "kid" header claim value that isn't yet in the cache, the JWKS endpoint will be queried again on demand. However, the broker polls the URL every `sasl.oauthbearer.jwks.endpoint.refresh.ms` milliseconds to refresh the cache with any forthcoming keys before any JWT requests that include them are received. If the URL is file-based, the broker will load the JWKS file from a configured location on startup. In the event that the JWT includes a "kid" header value that isn't in the JWKS file, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.token.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The URL for the OAuth/OIDC identity provider. If the URL is HTTP(S)-based, it is the issuer's token endpoint URL to which requests will be made to login based on the configuration in `sasl.jaas.config`. If the URL is file-based, it specifies a file containing an access token (in JWT serialized form) issued by the OAuth/OIDC identity provider to use for authorization.

### **sasl.server.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

The fully qualified name of a SASL server callback handler class that implements the `AuthenticateCallbackHandler` interface. Server callback handlers must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.plain.sasl.server.callback.handler.class=com.example.CustomPlainCallbackHandler`

### **sasl.server.max.receive.size**

**Type:** int

**Default:** 524288

**Importance:** medium

**Dynamic update:** read-only

The maximum receive size allowed before and during initial SASL authentication. Default receive size is 512KB. GSSAPI limits requests to 64K, but we allow upto 512KB by default for custom SASL mechanisms. In practice, PLAIN, SCRAM and OAUTH mechanisms can use much smaller limits.

### **security.inter.broker.protocol**

**Type:** string

**Default:** PLAINTEXT

**Valid Values:** [PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL]

**Importance:** medium

**Dynamic update:** read-only

Security protocol used to communicate between brokers. Valid values are: PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL. It is an error to set this and `inter.broker.listener.name` properties at the same time.

### **socket.connection.setup.timeout.max.ms**

**Type:** long  
**Default:** 30000 (30 seconds)  
**Importance:** medium  
**Dynamic update:** read-only

The maximum amount of time the client will wait for the socket connection to be established. The connection setup timeout will increase exponentially for each consecutive connection failure up to this maximum. To avoid connection storms, a randomization factor of 0.2 will be applied to the timeout resulting in a random range between 20% below and 20% above the computed value.

### **socket.connection.setup.timeout.ms**

**Type:** long  
**Default:** 10000 (10 seconds)  
**Importance:** medium  
**Dynamic update:** read-only

The amount of time the client will wait for the socket connection to be established. If the connection is not built before the timeout elapses, clients will close the socket channel.

### **socket.listen.backlog.size**

**Type:** int  
**Default:** 50  
**Valid Values:** [1,...]  
**Importance:** medium  
**Dynamic update:** read-only

The maximum number of pending connections on the socket. In Linux, you may also need to configure **somaxconn** and **tcp\_max\_syn\_backlog** kernel parameters accordingly to make the configuration takes effect.

### **ssl.cipher.suites**

**Type:** list  
**Default:** ""  
**Importance:** medium  
**Dynamic update:** per-broker

A list of cipher suites. This is a named combination of authentication, encryption, MAC and key exchange algorithm used to negotiate the security settings for a network connection using TLS or SSL network protocol. By default all the available cipher suites are supported.

### **ssl.client.auth**

**Type:** string  
**Default:** none  
**Valid Values:** [required, requested, none]  
**Importance:** medium  
**Dynamic update:** per-broker

Configures kafka broker to request client authentication. The following settings are common:

- **ssl.client.auth=required** If set to required client authentication is required.
- **ssl.client.auth=requested** This means client authentication is optional. unlike required, if this option is set client can choose not to provide authentication information about itself



- **ssl.client.auth=none** This means client authentication is not needed.

### ssl.enabled.protocols

**Type:** list

**Default:** TLSv1.2,TLSv1.3

**Importance:** medium

**Dynamic update:** per-broker

The list of protocols enabled for SSL connections. The default is 'TLSv1.2,TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. With the default value for Java 11, clients and servers will prefer TLSv1.3 if both support it and fallback to TLSv1.2 otherwise (assuming both support at least TLSv1.2). This default should be fine for most cases. Also see the config documentation for **ssl.protocol**.

### ssl.key.password

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** per-broker

The password of the private key in the key store file or the PEM key specified in 'ssl.keystore.key'.

### ssl.keymanager.algorithm

**Type:** string

**Default:** SunX509

**Importance:** medium

**Dynamic update:** per-broker

The algorithm used by key manager factory for SSL connections. Default value is the key manager factory algorithm configured for the Java Virtual Machine.

### ssl.keystore.certificate.chain

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** per-broker

Certificate chain in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with a list of X.509 certificates.

### ssl.keystore.key

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** per-broker

Private key in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with PKCS#8 keys. If the key is encrypted, key password must be specified using 'ssl.key.password'.

### ssl.keystore.location

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** per-broker

The location of the key store file. This is optional for client and can be used for two-way authentication for client.

**ssl.keystore.password****Type:** password**Default:** null**Importance:** medium**Dynamic update:** per-broker

The store password for the key store file. This is optional for client and only needed if 'ssl.keystore.location' is configured. Key store password is not supported for PEM format.

**ssl.keystore.type****Type:** string**Default:** JKS**Importance:** medium**Dynamic update:** per-broker

The file format of the key store file. This is optional for client. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

**ssl.protocol****Type:** string**Default:** TLSv1.3**Importance:** medium**Dynamic update:** per-broker

The SSL protocol used to generate the SSLContext. The default is 'TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. This value should be fine for most use cases. Allowed values in recent JVMs are 'TLSv1.2' and 'TLSv1.3'. 'TLS', 'TLSv1.1', 'SSL', 'SSLv2' and 'SSLv3' may be supported in older JVMs, but their usage is discouraged due to known security vulnerabilities. With the default value for this config and 'ssl.enabled.protocols', clients will downgrade to 'TLSv1.2' if the server does not support 'TLSv1.3'. If this config is set to 'TLSv1.2', clients will not use 'TLSv1.3' even if it is one of the values in ssl.enabled.protocols and the server only supports 'TLSv1.3'.

**ssl.provider****Type:** string**Default:** null**Importance:** medium**Dynamic update:** per-broker

The name of the security provider used for SSL connections. Default value is the default security provider of the JVM.

**ssl.trustmanager.algorithm****Type:** string**Default:** PKIX**Importance:** medium**Dynamic update:** per-broker

The algorithm used by trust manager factory for SSL connections. Default value is the trust manager factory algorithm configured for the Java Virtual Machine.

**ssl.truststore.certificates****Type:** password**Default:** null**Importance:** medium**Dynamic update:** per-broker

Trusted certificates in the format specified by 'ssl.truststore.type'. Default SSL engine factory supports only PEM format with X.509 certificates.

**ssl.truststore.location****Type:** string**Default:** null**Importance:** medium**Dynamic update:** per-broker

The location of the trust store file.

**ssl.truststore.password****Type:** password**Default:** null**Importance:** medium**Dynamic update:** per-broker

The password for the trust store file. If a password is not set, trust store file configured will still be used, but integrity checking is disabled. Trust store password is not supported for PEM format.

**ssl.truststore.type****Type:** string**Default:** JKS**Importance:** medium**Dynamic update:** per-brokerThe file format of the trust store file. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].**zookeeper.clientCnxnSocket****Type:** string**Default:** null**Importance:** medium**Dynamic update:** read-onlyTypically set to **org.apache.zookeeper.ClientCnxnSocketNetty** when using TLS connectivity to ZooKeeper. Overrides any explicit value set via the same-named **zookeeper.clientCnxnSocket** system property.**zookeeper.ssl.client.enable****Type:** boolean**Default:** false**Importance:** medium**Dynamic update:** read-onlySet client to use TLS when connecting to ZooKeeper. An explicit value overrides any value set via the **zookeeper.client.secure** system property (note the different name). Defaults to false if neither is set; when true, **zookeeper.clientCnxnSocket** must be set (typically to **org.apache.zookeeper.ClientCnxnSocketNetty**); other values to set may include **zookeeper.ssl.cipher.suites**, **zookeeper.ssl.crl.enable**, **zookeeper.ssl.enabled.protocols**, **zookeeper.ssl.endpoint.identification.algorithm**, **zookeeper.ssl.keystore.location**, **zookeeper.ssl.keystore.password**, **zookeeper.ssl.keystore.type**, **zookeeper.ssl.ocsp.enable**, **zookeeper.ssl.protocol**, **zookeeper.ssl.truststore.location**, **zookeeper.ssl.truststore.password**, **zookeeper.ssl.truststore.type**.**zookeeper.ssl.keystore.location****Type:** string**Default:** null**Importance:** medium**Dynamic update:** read-only

Keystore location when using a client-side certificate with TLS connectivity to ZooKeeper. Overrides any explicit value set via the **zookeeper.ssl.keyStore.location** system property (note the camelCase).

### **zookeeper.ssl.keystore.password**

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Keystore password when using a client-side certificate with TLS connectivity to ZooKeeper. Overrides any explicit value set via the **zookeeper.ssl.keyStore.password** system property (note the camelCase). Note that ZooKeeper does not support a key password different from the keystore password, so be sure to set the key password in the keystore to be identical to the keystore password; otherwise the connection attempt to Zookeeper will fail.

### **zookeeper.ssl.keystore.type**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Keystore type when using a client-side certificate with TLS connectivity to ZooKeeper. Overrides any explicit value set via the **zookeeper.ssl.keyStore.type** system property (note the camelCase). The default value of **null** means the type will be auto-detected based on the filename extension of the keystore.

### **zookeeper.ssl.truststore.location**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Truststore location when using TLS connectivity to ZooKeeper. Overrides any explicit value set via the **zookeeper.ssl.trustStore.location** system property (note the camelCase).

### **zookeeper.ssl.truststore.password**

**Type:** password

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Truststore password when using TLS connectivity to ZooKeeper. Overrides any explicit value set via the **zookeeper.ssl.trustStore.password** system property (note the camelCase).

### **zookeeper.ssl.truststore.type**

**Type:** string

**Default:** null

**Importance:** medium

**Dynamic update:** read-only

Truststore type when using TLS connectivity to ZooKeeper. Overrides any explicit value set via the **zookeeper.ssl.trustStore.type** system property (note the camelCase). The default value of **null** means the type will be auto-detected based on the filename extension of the truststore.

### **alter.config.policy.class.name**

**Type:** class

**Default:** null

**Importance:** low

**Dynamic update:** read-only

The alter configs policy class that should be used for validation. The class should implement the **org.apache.kafka.server.policy.AlterConfigPolicy** interface.

#### **alter.log.dirs.replication.quota.window.num**

**Type:** int

**Default:** 11

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The number of samples to retain in memory for alter log dirs replication quotas.

#### **alter.log.dirs.replication.quota.window.size.seconds**

**Type:** int

**Default:** 1

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The time span of each sample for alter log dirs replication quotas.

#### **authorizer.class.name**

**Type:** string

**Default:** ""

**Valid Values:** non-null string

**Importance:** low

**Dynamic update:** read-only

The fully qualified name of a class that implements **org.apache.kafka.server.authorizer.Authorizer** interface, which is used by the broker for authorization.

#### **auto.include.jmx.reporter**

**Type:** boolean

**Default:** true

**Importance:** low

**Dynamic update:** read-only

Deprecated. Whether to automatically include JmxReporter even if it's not listed in **metric.reporters**. This configuration will be removed in Kafka 4.0, users should instead include **org.apache.kafka.common.metrics.JmxReporter** in **metric.reporters** in order to enable the JmxReporter.

#### **client.quota.callback.class**

**Type:** class

**Default:** null

**Importance:** low

**Dynamic update:** read-only

The fully qualified name of a class that implements the ClientQuotaCallback interface, which is used to determine quota limits applied to client requests. By default, the <user> and <client-id> quotas that are stored in ZooKeeper are applied. For any given request, the most specific quota that matches the user principal of the session and the client-id of the request is applied.

#### **connection.failed.authentication.delay.ms**

**Type:** int

**Default:** 100

**Valid Values:** [0,...]

**Importance:** low

**Dynamic update:** read-only

Connection close delay on failed authentication: this is the time (in milliseconds) by which connection close will be delayed on authentication failure. This must be configured to be less than `connections.max.idle.ms` to prevent connection timeout.

### **controller.quorum.retry.backoff.ms**

**Type:** int

**Default:** 20

**Importance:** low

**Dynamic update:** read-only

The amount of time to wait before attempting to retry a failed request to a given topic partition. This avoids repeatedly sending requests in a tight loop under some failure scenarios.

### **controller.quota.window.num**

**Type:** int

**Default:** 11

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The number of samples to retain in memory for controller mutation quotas.

### **controller.quota.window.size.seconds**

**Type:** int

**Default:** 1

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The time span of each sample for controller mutations quotas.

### **create.topic.policy.class.name**

**Type:** class

**Default:** null

**Importance:** low

**Dynamic update:** read-only

The create topic policy class that should be used for validation. The class should implement the **`org.apache.kafka.server.policy.CreateTopicPolicy`** interface.

### **delegation.token.expiry.check.interval.ms**

**Type:** long

**Default:** 3600000 (1 hour)

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

Scan interval to remove expired delegation tokens.

### **kafka.metrics.polling.interval.secs**

**Type:** int

**Default:** 10

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The metrics polling interval (in seconds) which can be used in `kafka.metrics.reporters` implementations.

### **kafka.metrics.reporters**

**Type:** list

**Default:** ""

**Importance:** low

**Dynamic update:** read-only

A list of classes to use as Yammer metrics custom reporters. The reporters should implement **kafka.metrics.KafkaMetricsReporter** trait. If a client wants to expose JMX operations on a custom reporter, the custom reporter needs to additionally implement an MBean trait that extends **kafka.metrics.KafkaMetricsReporterMBean** trait so that the registered MBean is compliant with the standard MBean convention.

### **listener.security.protocol.map**

**Type:** string

**Default:**

PLAINTEXT:PLAINTEXT,SSL:SSL,SASL\_PLAINTEXT:SASL\_PLAINTEXT,SASL\_SSL:SASL\_SSL

**Importance:** low

**Dynamic update:** per-broker

Map between listener names and security protocols. This must be defined for the same security protocol to be usable in more than one port or IP. For example, internal and external traffic can be separated even if SSL is required for both. Concretely, the user could define listeners with names INTERNAL and EXTERNAL and this property as: **INTERNAL:SSL,EXTERNAL:SSL**. As shown, key and value are separated by a colon and map entries are separated by commas. Each listener name should only appear once in the map. Different security (SSL and SASL) settings can be configured for each listener by adding a normalised prefix (the listener name is lowercased) to the config name. For example, to set a different keystore for the INTERNAL listener, a config with name **listener.name.internal.ssl.keystore.location** would be set. If the config for the listener name is not set, the config will fallback to the generic config (i.e. **ssl.keystore.location**). Note that in KRaft a default mapping from the listener names defined by **controller.listener.names** to PLAINTEXT is assumed if no explicit mapping is provided and no other security protocol is in use.

### **log.message.downconversion.enable**

**Type:** boolean

**Default:** true

**Importance:** low

**Dynamic update:** cluster-wide

This configuration controls whether down-conversion of message formats is enabled to satisfy consume requests. When set to **false**, broker will not perform down-conversion for consumers expecting an older message format. The broker responds with **UNSUPPORTED\_VERSION** error for consume requests from such older clients. This configuration does not apply to any message format conversion that might be required for replication to followers.

### **metadata.max.idle.interval.ms**

**Type:** int

**Default:** 500

**Valid Values:** [0,...]

**Importance:** low

**Dynamic update:** read-only

This configuration controls how often the active controller should write no-op records to the metadata partition. If the value is 0, no-op records are not appended to the metadata partition. The default value is 500.

### **metric.reporters**

**Type:** list

**Default:** ""

**Importance:** low

**Dynamic update:** cluster-wide

A list of classes to use as metrics reporters. Implementing the **org.apache.kafka.common.metrics.MetricsReporter** interface allows plugging in classes that will be notified of new metric creation. The JmxReporter is always included to register JMX statistics.

### **metrics.num.samples**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The number of samples maintained to compute metrics.

### **metrics.recording.level**

**Type:** string

**Default:** INFO

**Importance:** low

**Dynamic update:** read-only

The highest recording level for metrics.

### **metrics.sample.window.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The window of time a metrics sample is computed over.

### **password.encoder.cipher.algorithm**

**Type:** string

**Default:** AES/CBC/PKCS5Padding

**Importance:** low

**Dynamic update:** read-only

The Cipher algorithm used for encoding dynamically configured passwords.

### **password.encoder.iterations**

**Type:** int

**Default:** 4096

**Valid Values:** [1024,...]

**Importance:** low

**Dynamic update:** read-only

The iteration count used for encoding dynamically configured passwords.

### **password.encoder.key.length**



**Type:** int  
**Default:** 128  
**Valid Values:** [8,...]  
**Importance:** low  
**Dynamic update:** read-only  
The key length used for encoding dynamically configured passwords.

### **password.encoder.keyfactory.algorithm**

**Type:** string  
**Default:** null  
**Importance:** low  
**Dynamic update:** read-only  
The SecretKeyFactory algorithm used for encoding dynamically configured passwords. Default is PBKDF2WithHmacSHA512 if available and PBKDF2WithHmacSHA1 otherwise.

### **producer.id.expiration.ms**

**Type:** int  
**Default:** 86400000 (1 day)  
**Valid Values:** [1,...]  
**Importance:** low  
**Dynamic update:** cluster-wide  
The time in ms that a topic partition leader will wait before expiring producer IDs. Producer IDs will not expire while a transaction associated to them is still ongoing. Note that producer IDs may expire sooner if the last write from the producer ID is deleted due to the topic's retention settings. Setting this value the same or higher than **delivery.timeout.ms** can help prevent expiration during retries and protect against message duplication, but the default should be reasonable for most use cases.

### **quota.window.num**

**Type:** int  
**Default:** 11  
**Valid Values:** [1,...]  
**Importance:** low  
**Dynamic update:** read-only  
The number of samples to retain in memory for client quotas.

### **quota.window.size.seconds**

**Type:** int  
**Default:** 1  
**Valid Values:** [1,...]  
**Importance:** low  
**Dynamic update:** read-only  
The time span of each sample for client quotas.

### **remote.log.manager.task.interval.ms**

**Type:** long  
**Default:** 30000 (30 seconds)  
**Valid Values:** [1,...]  
**Importance:** low  
**Dynamic update:** read-only  
Interval at which remote log manager runs the scheduled tasks like copy segments, and clean up remote log segments.

**remote.log.metadata.custom.metadata.max.bytes****Type:** int**Default:** 128**Valid Values:** [0,...]**Importance:** low**Dynamic update:** read-only

The maximum size of custom metadata in bytes that the broker should accept from a remote storage plugin. If custom metadata exceeds this limit, the updated segment metadata will not be stored, the copied data will be attempted to delete, and the remote copying task for this topic-partition will stop with an error.

**replication.quota.window.num****Type:** int**Default:** 11**Valid Values:** [1,...]**Importance:** low**Dynamic update:** read-only

The number of samples to retain in memory for replication quotas.

**replication.quota.window.size.seconds****Type:** int**Default:** 1**Valid Values:** [1,...]**Importance:** low**Dynamic update:** read-only

The time span of each sample for replication quotas.

**sasl.login.connect.timeout.ms****Type:** int**Default:** null**Importance:** low**Dynamic update:** read-only

The (optional) value in milliseconds for the external authentication provider connection timeout. Currently applies only to OAUTHBEARER.

**sasl.login.read.timeout.ms****Type:** int**Default:** null**Importance:** low**Dynamic update:** read-only

The (optional) value in milliseconds for the external authentication provider read timeout. Currently applies only to OAUTHBEARER.

**sasl.login.retry.backoff.max.ms****Type:** long**Default:** 10000 (10 seconds)**Importance:** low**Dynamic update:** read-only

The (optional) value in milliseconds for the maximum wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum

wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

### **sasl.login.retry.backoff.ms**

**Type:** long

**Default:** 100

**Importance:** low

**Dynamic update:** read-only

The (optional) value in milliseconds for the initial wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

### **sasl.oauthbearer.clock.skew.seconds**

**Type:** int

**Default:** 30

**Importance:** low

**Dynamic update:** read-only

The (optional) value in seconds to allow for differences between the time of the OAuth/OIDC identity provider and the broker.

### **sasl.oauthbearer.expected.audience**

**Type:** list

**Default:** null

**Importance:** low

**Dynamic update:** read-only

The (optional) comma-delimited setting for the broker to use to verify that the JWT was issued for one of the expected audiences. The JWT will be inspected for the standard OAuth "aud" claim and if this value is set, the broker will match the value from JWT's "aud" claim to see if there is an exact match. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.expected.issuer**

**Type:** string

**Default:** null

**Importance:** low

**Dynamic update:** read-only

The (optional) setting for the broker to use to verify that the JWT was created by the expected issuer. The JWT will be inspected for the standard OAuth "iss" claim and if this value is set, the broker will match it exactly against what is in the JWT's "iss" claim. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.jwks.endpoint.refresh.ms**

**Type:** long

**Default:** 3600000 (1 hour)

**Importance:** low

**Dynamic update:** read-only

The (optional) value in milliseconds for the broker to wait between refreshing its JWKS (JSON Web Key Set) cache that contains the keys to verify the signature of the JWT.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

**Dynamic update:** read-only

The (optional) value in milliseconds for the maximum wait between attempts to retrieve the JWKS (JSON Web Key Set) from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.ms**

**Type:** long

**Default:** 100

**Importance:** low

**Dynamic update:** read-only

The (optional) value in milliseconds for the initial wait between JWKS (JSON Web Key Set) retrieval attempts from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.scope.claim.name**

**Type:** string

**Default:** scope

**Importance:** low

**Dynamic update:** read-only

The OAuth claim for the scope is often named "scope", but this (optional) setting can provide a different name to use for the scope included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **sasl.oauthbearer.sub.claim.name**

**Type:** string

**Default:** sub

**Importance:** low

**Dynamic update:** read-only

The OAuth claim for the subject is often named "sub", but this (optional) setting can provide a different name to use for the subject included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **security.providers**

**Type:** string

**Default:** null

**Importance:** low

**Dynamic update:** read-only

A list of configurable creator classes each returning a provider implementing security algorithms. These classes should implement the **`org.apache.kafka.common.security.auth.SecurityProviderCreator`** interface.

### **ssl.endpoint.identification.algorithm**

**Type:** string

**Default:** https

**Importance:** low

**Dynamic update:** per-broker

The endpoint identification algorithm to validate server hostname using server certificate.

### **ssl.engine.factory.class**

**Type:** class

**Default:** null

**Importance:** low

**Dynamic update:** per-broker

The class of type `org.apache.kafka.common.security.auth.SslEngineFactory` to provide `SSL`Engine objects. Default value is `org.apache.kafka.common.security.ssl.DefaultSslEngineFactory`.

### **ssl.principal.mapping.rules**

**Type:** string

**Default:** DEFAULT

**Importance:** low

**Dynamic update:** read-only

A list of rules for mapping from distinguished name from the client certificate to short name. The rules are evaluated in order and the first rule that matches a principal name is used to map it to a short name. Any later rules in the list are ignored. By default, distinguished name of the X.500 certificate will be the principal. For more details on the format please see [security authorization and acls](#). Note that this configuration is ignored if an extension of `KafkaPrincipalBuilder` is provided by the **principal.builder.class** configuration.

### **ssl.secure.random.implementation**

**Type:** string

**Default:** null

**Importance:** low

**Dynamic update:** per-broker

The `SecureRandom` PRNG implementation to use for `SSL` cryptography operations.

### **transaction.abort.timed.out.transaction.cleanup.interval.ms**

**Type:** int

**Default:** 10000 (10 seconds)

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The interval at which to rollback transactions that have timed out.

### **transaction.partition.verification.enable**

**Type:** boolean

**Default:** true

**Importance:** low

**Dynamic update:** cluster-wide

Enable verification that checks that the partition has been added to the transaction before writing transactional records to the partition.

### **transaction.remove.expired.transaction.cleanup.interval.ms**

**Type:** int

**Default:** 3600000 (1 hour)

**Valid Values:** [1,...]

**Importance:** low

**Dynamic update:** read-only

The interval at which to remove transactions that have expired due to **transactional.id.expiration.ms** passing.

### **zookeeper.ssl.cipher.suites**

**Type:** list

**Default:** null

**Importance:** low

**Dynamic update:** read-only

Specifies the enabled cipher suites to be used in ZooKeeper TLS negotiation (csv). Overrides any explicit value set via the **zookeeper.ssl.ciphersuites** system property (note the single word "ciphersuites"). The default value of **null** means the list of enabled cipher suites is determined by the Java runtime being used.

### **zookeeper.ssl.crl.enable**

**Type:** boolean

**Default:** false

**Importance:** low

**Dynamic update:** read-only

Specifies whether to enable Certificate Revocation List in the ZooKeeper TLS protocols. Overrides any explicit value set via the **zookeeper.ssl.crl** system property (note the shorter name).

### **zookeeper.ssl.enabled.protocols**

**Type:** list

**Default:** null

**Importance:** low

**Dynamic update:** read-only

Specifies the enabled protocol(s) in ZooKeeper TLS negotiation (csv). Overrides any explicit value set via the **zookeeper.ssl.enabledProtocols** system property (note the camelCase). The default value of **null** means the enabled protocol will be the value of the **zookeeper.ssl.protocol** configuration property.

### **zookeeper.ssl.endpoint.identification.algorithm**

**Type:** string

**Default:** HTTPS

**Importance:** low

**Dynamic update:** read-only

Specifies whether to enable hostname verification in the ZooKeeper TLS negotiation process, with (case-insensitively) "https" meaning ZooKeeper hostname verification is enabled and an explicit blank value meaning it is disabled (disabling it is only recommended for testing purposes). An explicit value overrides any "true" or "false" value set via the **zookeeper.ssl.hostnameVerification** system property (note the different name and values; true implies https and false implies blank).

### **zookeeper.ssl.ocsp.enable**

**Type:** boolean

**Default:** false

**Importance:** low

**Dynamic update:** read-only

Specifies whether to enable Online Certificate Status Protocol in the ZooKeeper TLS protocols. Overrides any explicit value set via the **zookeeper.ssl.ocsp** system property (note the shorter name).

### **zookeeper.ssl.protocol**

**Type:** string

**Default:** TLSv1.2

**Importance:** low

**Dynamic update:** read-only

Specifies the protocol to be used in ZooKeeper TLS negotiation. An explicit value overrides any value set via the same-named **zookeeper.ssl.protocol** system property.

## CHAPTER 2. TOPIC CONFIGURATION PROPERTIES

### cleanup.policy

**Type:** list

**Default:** delete

**Valid Values:** [compact, delete]

**Server Default Property:** log.cleanup.policy

**Importance:** medium

This config designates the retention policy to use on log segments. The "delete" policy (which is the default) will discard old segments when their retention time or size limit has been reached. The "compact" policy will enable [log compaction](#), which retains the latest value for each key. It is also possible to specify both policies in a comma-separated list (e.g. "delete,compact"). In this case, old segments will be discarded per the retention time and size configuration, while retained segments will be compacted.

### compression.type

**Type:** string

**Default:** producer

**Valid Values:** [uncompressed, zstd, lz4, snappy, gzip, producer]

**Server Default Property:** compression.type

**Importance:** medium

Specify the final compression type for a given topic. This configuration accepts the standard compression codecs ('gzip', 'snappy', 'lz4', 'zstd'). It additionally accepts 'uncompressed' which is equivalent to no compression; and 'producer' which means retain the original compression codec set by the producer.

### delete.retention.ms

**Type:** long

**Default:** 86400000 (1 day)

**Valid Values:** [0,...]

**Server Default Property:** log.cleaner.delete.retention.ms

**Importance:** medium

The amount of time to retain delete tombstone markers for [log compacted](#) topics. This setting also gives a bound on the time in which a consumer must complete a read if they begin from offset 0 to ensure that they get a valid snapshot of the final stage (otherwise delete tombstones may be collected before they complete their scan).

### file.delete.delay.ms

**Type:** long

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Server Default Property:** log.segment.delete.delay.ms

**Importance:** medium

The time to wait before deleting a file from the filesystem.

### flush.messages

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [1,...]

**Server Default Property:** log.flush.interval.messages

**Importance:** medium

This setting allows specifying an interval at which we will force an fsync of data written to the log. For



example if this was set to 1 we would fsync after every message; if it were 5 we would fsync after every five messages. In general we recommend you not set this and use replication for durability and allow the operating system's background flush capabilities as it is more efficient. This setting can be overridden on a per-topic basis (see [the per-topic configuration section](#)).

### flush.ms

**Type:** long

**Default:** 9223372036854775807

**Valid Values:** [0,...]

**Server Default Property:** log.flush.interval.ms

**Importance:** medium

This setting allows specifying a time interval at which we will force an fsync of data written to the log. For example if this was set to 1000 we would fsync after 1000 ms had passed. In general we recommend you not set this and use replication for durability and allow the operating system's background flush capabilities as it is more efficient.

### follower.replication.throttled.replicas

**Type:** list

**Default:** ""

**Valid Values:** [partitionId]:[brokerId],[partitionId]:[brokerId],...

**Server Default Property:** null

**Importance:** medium

A list of replicas for which log replication should be throttled on the follower side. The list should describe a set of replicas in the form [PartitionId]:[BrokerId],[PartitionId]:[BrokerId]:... or alternatively the wildcard '\*' can be used to throttle all replicas for this topic.

### index.interval.bytes

**Type:** int

**Default:** 4096 (4 kibibytes)

**Valid Values:** [0,...]

**Server Default Property:** log.index.interval.bytes

**Importance:** medium

This setting controls how frequently Kafka adds an index entry to its offset index. The default setting ensures that we index a message roughly every 4096 bytes. More indexing allows reads to jump closer to the exact position in the log but makes the index larger. You probably don't need to change this.

### leader.replication.throttled.replicas

**Type:** list

**Default:** ""

**Valid Values:** [partitionId]:[brokerId],[partitionId]:[brokerId],...

**Server Default Property:** null

**Importance:** medium

A list of replicas for which log replication should be throttled on the leader side. The list should describe a set of replicas in the form [PartitionId]:[BrokerId],[PartitionId]:[BrokerId]:... or alternatively the wildcard '\*' can be used to throttle all replicas for this topic.

### local.retention.bytes

**Type:** long

**Default:** -2

**Valid Values:** [-2,...]

**Server Default Property:** log.local.retention.bytes

**Importance:** medium

The maximum size of local log segments that can grow for a partition before it deletes the old segments. Default value is `-2`, it represents **retention.bytes** value to be used. The effective value should always be less than or equal to **retention.bytes** value.

### **local.retention.ms**

**Type:** long

**Default:** `-2`

**Valid Values:** `[-2,...]`

**Server Default Property:** `log.local.retention.ms`

**Importance:** medium

The number of milli seconds to keep the local log segment before it gets deleted. Default value is `-2`, it represents **retention.ms** value is to be used. The effective value should always be less than or equal to **retention.ms** value.

### **max.compaction.lag.ms**

**Type:** long

**Default:** `9223372036854775807`

**Valid Values:** `[1,...]`

**Server Default Property:** `log.cleaner.max.compaction.lag.ms`

**Importance:** medium

The maximum time a message will remain ineligible for compaction in the log. Only applicable for logs that are being compacted.

### **max.message.bytes**

**Type:** int

**Default:** `1048588`

**Valid Values:** `[0,...]`

**Server Default Property:** `message.max.bytes`

**Importance:** medium

The largest record batch size allowed by Kafka (after compression if compression is enabled). If this is increased and there are consumers older than 0.10.2, the consumers' fetch size must also be increased so that they can fetch record batches this large. In the latest message format version, records are always grouped into batches for efficiency. In previous message format versions, uncompressed records are not grouped into batches and this limit only applies to a single record in that case.

### **message.format.version**

**Type:** string

**Default:** `3.0-IV1`

**Valid Values:** `[0.8.0, 0.8.1, 0.8.2, 0.9.0, 0.10.0-IV0, 0.10.0-IV1, 0.10.1-IV0, 0.10.1-IV1, 0.10.1-IV2, 0.10.2-IV0, 0.11.0-IV0, 0.11.0-IV1, 0.11.0-IV2, 1.0-IV0, 1.1-IV0, 2.0-IV0, 2.0-IV1, 2.1-IV0, 2.1-IV1, 2.1-IV2, 2.2-IV0, 2.2-IV1, 2.3-IV0, 2.3-IV1, 2.4-IV0, 2.4-IV1, 2.5-IV0, 2.6-IV0, 2.7-IV0, 2.7-IV1, 2.7-IV2, 2.8-IV0, 2.8-IV1, 3.0-IV0, 3.0-IV1, 3.1-IV0, 3.2-IV0, 3.3-IV0, 3.3-IV1, 3.3-IV2, 3.3-IV3, 3.4-IV0, 3.5-IV0, 3.5-IV1, 3.5-IV2, 3.6-IV0, 3.6-IV1, 3.6-IV2]`

**Server Default Property:** `log.message.format.version`

**Importance:** medium

[DEPRECATED] Specify the message format version the broker will use to append messages to the logs. The value of this config is always assumed to be **3.0** if **inter.broker.protocol.version** is 3.0 or higher (the actual config value is ignored). Otherwise, the value should be a valid `ApiVersion`. Some examples are: `0.10.0`, `1.1`, `2.8`, `3.0`. By setting a particular message format version, the user is certifying that all the existing messages on disk are smaller or equal than the specified version. Setting this value incorrectly will cause consumers with older versions to break as they will receive messages with a format that they don't understand.

**message.timestamp.after.max.ms****Type:** long**Default:** 9223372036854775807**Valid Values:** [0,...]**Server Default Property:** log.message.timestamp.after.max.ms**Importance:** medium

This configuration sets the allowable timestamp difference between the message timestamp and the broker's timestamp. The message timestamp can be later than or equal to the broker's timestamp, with the maximum allowable difference determined by the value set in this configuration. If `message.timestamp.type=CreateTime`, the message will be rejected if the difference in timestamps exceeds this specified threshold. This configuration is ignored if `message.timestamp.type=LogAppendTime`.

**message.timestamp.before.max.ms****Type:** long**Default:** 9223372036854775807**Valid Values:** [0,...]**Server Default Property:** log.message.timestamp.before.max.ms**Importance:** medium

This configuration sets the allowable timestamp difference between the broker's timestamp and the message timestamp. The message timestamp can be earlier than or equal to the broker's timestamp, with the maximum allowable difference determined by the value set in this configuration. If `message.timestamp.type=CreateTime`, the message will be rejected if the difference in timestamps exceeds this specified threshold. This configuration is ignored if `message.timestamp.type=LogAppendTime`.

**message.timestamp.difference.max.ms****Type:** long**Default:** 9223372036854775807**Valid Values:** [0,...]**Server Default Property:** log.message.timestamp.difference.max.ms**Importance:** medium

[DEPRECATED] The maximum difference allowed between the timestamp when a broker receives a message and the timestamp specified in the message. If `message.timestamp.type=CreateTime`, a message will be rejected if the difference in timestamp exceeds this threshold. This configuration is ignored if `message.timestamp.type=LogAppendTime`.

**message.timestamp.type****Type:** string**Default:** CreateTime**Valid Values:** [CreateTime, LogAppendTime]**Server Default Property:** log.message.timestamp.type**Importance:** medium

Define whether the timestamp in the message is message create time or log append time. The value should be either **CreateTime** or **LogAppendTime**.

**min.cleanable.dirty.ratio****Type:** double**Default:** 0.5**Valid Values:** [0,...,1]**Server Default Property:** log.cleaner.min.cleanable.ratio**Importance:** medium

This configuration controls how frequently the log compactor will attempt to clean the log (assuming

`log.compaction` is enabled). By default we will avoid cleaning a log where more than 50% of the log has been compacted. This ratio bounds the maximum space wasted in the log by duplicates (at 50% at most 50% of the log could be duplicates). A higher ratio will mean fewer, more efficient cleanings but will mean more wasted space in the log. If the `max.compaction.lag.ms` or the `min.compaction.lag.ms` configurations are also specified, then the log compactor considers the log to be eligible for compaction as soon as either: (i) the dirty ratio threshold has been met and the log has had dirty (uncompactable) records for at least the `min.compaction.lag.ms` duration, or (ii) if the log has had dirty (uncompactable) records for at most the `max.compaction.lag.ms` period.

### **min.compaction.lag.ms**

**Type:** long

**Default:** 0

**Valid Values:** [0,...]

**Server Default Property:** `log.cleaner.min.compaction.lag.ms`

**Importance:** medium

The minimum time a message will remain uncompactable in the log. Only applicable for logs that are being compacted.

### **min.insync.replicas**

**Type:** int

**Default:** 1

**Valid Values:** [1,...]

**Server Default Property:** `min.insync.replicas`

**Importance:** medium

When a producer sets `acks` to "all" (or "-1"), this configuration specifies the minimum number of replicas that must acknowledge a write for the write to be considered successful. If this minimum cannot be met, then the producer will raise an exception (either `NotEnoughReplicas` or `NotEnoughReplicasAfterAppend`). When used together, **`min.insync.replicas`** and **`acks`** allow you to enforce greater durability guarantees. A typical scenario would be to create a topic with a replication factor of 3, set **`min.insync.replicas`** to 2, and produce with **`acks`** of "all". This will ensure that the producer raises an exception if a majority of replicas do not receive a write.

### **preallocate**

**Type:** boolean

**Default:** false

**Server Default Property:** `log.preallocate`

**Importance:** medium

True if we should preallocate the file on disk when creating a new log segment.

### **remote.storage.enable**

**Type:** boolean

**Default:** false

**Server Default Property:** null

**Importance:** medium

To enable tiered storage for a topic, set this configuration as true. You can not disable this config once it is enabled. It will be provided in future versions.

### **retention.bytes**

**Type:** long

**Default:** -1

**Server Default Property:** `log.retention.bytes`

**Importance:** medium

This configuration controls the maximum size a partition (which consists of log segments) can grow

to before we will discard old log segments to free up space if we are using the "delete" retention policy. By default there is no size limit only a time limit. Since this limit is enforced at the partition level, multiply it by the number of partitions to compute the topic retention in bytes.

### **retention.ms**

**Type:** long  
**Default:** 604800000 (7 days)  
**Valid Values:** [-1,...]  
**Server Default Property:** log.retention.ms  
**Importance:** medium

This configuration controls the maximum time we will retain a log before we will discard old log segments to free up space if we are using the "delete" retention policy. This represents an SLA on how soon consumers must read their data. If set to -1, no time limit is applied.

### **segment.bytes**

**Type:** int  
**Default:** 1073741824 (1 gibibyte)  
**Valid Values:** [14,...]  
**Server Default Property:** log.segment.bytes  
**Importance:** medium

This configuration controls the segment file size for the log. Retention and cleaning is always done a file at a time so a larger segment size means fewer files but less granular control over retention.

### **segment.index.bytes**

**Type:** int  
**Default:** 10485760 (10 mebibytes)  
**Valid Values:** [4,...]  
**Server Default Property:** log.index.size.max.bytes  
**Importance:** medium

This configuration controls the size of the index that maps offsets to file positions. We preallocate this index file and shrink it only after log rolls. You generally should not need to change this setting.

### **segment.jitter.ms**

**Type:** long  
**Default:** 0  
**Valid Values:** [0,...]  
**Server Default Property:** log.roll.jitter.ms  
**Importance:** medium

The maximum random jitter subtracted from the scheduled segment roll time to avoid thundering herds of segment rolling.

### **segment.ms**

**Type:** long  
**Default:** 604800000 (7 days)  
**Valid Values:** [1,...]  
**Server Default Property:** log.roll.ms  
**Importance:** medium

This configuration controls the period of time after which Kafka will force the log to roll even if the segment file isn't full to ensure that retention can delete or compact old data.

### **unclean.leader.election.enable**

**Type:** boolean

**Default:** false

**Server Default Property:** unclean.leader.election.enable

**Importance:** medium

Indicates whether to enable replicas not in the ISR set to be elected as leader as a last resort, even though doing so may result in data loss.

### **message.downconversion.enable**

**Type:** boolean

**Default:** true

**Server Default Property:** log.message.downconversion.enable

**Importance:** low

This configuration controls whether down-conversion of message formats is enabled to satisfy consume requests. When set to **false**, broker will not perform down-conversion for consumers expecting an older message format. The broker responds with **UNSUPPORTED\_VERSION** error for consume requests from such older clients. This configuration does not apply to any message format conversion that might be required for replication to followers.

## CHAPTER 3. CONSUMER CONFIGURATION PROPERTIES

### key.deserializer

**Type:** class

**Importance:** high

Deserializer class for key that implements the **org.apache.kafka.common.serialization.Deserializer** interface.

### value.deserializer

**Type:** class

**Importance:** high

Deserializer class for value that implements the **org.apache.kafka.common.serialization.Deserializer** interface.

### bootstrap.servers

**Type:** list

**Default:** ""

**Valid Values:** non-null string

**Importance:** high

A list of host/port pairs to use for establishing the initial connection to the Kafka cluster. The client will make use of all servers irrespective of which servers are specified here for bootstrapping—this list only impacts the initial hosts used to discover the full set of servers. This list should be in the form **host1:port1,host2:port2,...**. Since these servers are just used for the initial connection to discover the full cluster membership (which may change dynamically), this list need not contain the full set of servers (you may want more than one, though, in case a server is down).

### fetch.min.bytes

**Type:** int

**Default:** 1

**Valid Values:** [0,...]

**Importance:** high

The minimum amount of data the server should return for a fetch request. If insufficient data is available the request will wait for that much data to accumulate before answering the request. The default setting of 1 byte means that fetch requests are answered as soon as that many byte(s) of data is available or the fetch request times out waiting for data to arrive. Setting this to a larger value will cause the server to wait for larger amounts of data to accumulate which can improve server throughput a bit at the cost of some additional latency.

### group.id

**Type:** string

**Default:** null

**Importance:** high

A unique string that identifies the consumer group this consumer belongs to. This property is required if the consumer uses either the group management functionality by using **subscribe(topic)** or the Kafka-based offset management strategy.

### heartbeat.interval.ms

**Type:** int

**Default:** 3000 (3 seconds)

**Importance:** high

The expected time between heartbeats to the consumer coordinator when using Kafka's group management facilities. Heartbeats are used to ensure that the consumer's session stays active and to

facilitate rebalancing when new consumers join or leave the group. The value must be set lower than **session.timeout.ms**, but typically should be set no higher than 1/3 of that value. It can be adjusted even lower to control the expected time for normal rebalances.

### **max.partition.fetch.bytes**

**Type:** int

**Default:** 1048576 (1 mebibyte)

**Valid Values:** [0,...]

**Importance:** high

The maximum amount of data per-partition the server will return. Records are fetched in batches by the consumer. If the first record batch in the first non-empty partition of the fetch is larger than this limit, the batch will still be returned to ensure that the consumer can make progress. The maximum record batch size accepted by the broker is defined via **message.max.bytes** (broker config) or **max.message.bytes** (topic config). See `fetch.max.bytes` for limiting the consumer request size.

### **session.timeout.ms**

**Type:** int

**Default:** 45000 (45 seconds)

**Importance:** high

The timeout used to detect client failures when using Kafka's group management facility. The client sends periodic heartbeats to indicate its liveness to the broker. If no heartbeats are received by the broker before the expiration of this session timeout, then the broker will remove this client from the group and initiate a rebalance. Note that the value must be in the allowable range as configured in the broker configuration by **group.min.session.timeout.ms** and **group.max.session.timeout.ms**.

### **ssl.key.password**

**Type:** password

**Default:** null

**Importance:** high

The password of the private key in the key store file or the PEM key specified in 'ssl.keystore.key'.

### **ssl.keystore.certificate.chain**

**Type:** password

**Default:** null

**Importance:** high

Certificate chain in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with a list of X.509 certificates.

### **ssl.keystore.key**

**Type:** password

**Default:** null

**Importance:** high

Private key in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with PKCS#8 keys. If the key is encrypted, key password must be specified using 'ssl.key.password'.

### **ssl.keystore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the key store file. This is optional for client and can be used for two-way authentication for client.



**ssl.keystore.password****Type:** password**Default:** null**Importance:** high

The store password for the key store file. This is optional for client and only needed if 'ssl.keystore.location' is configured. Key store password is not supported for PEM format.

**ssl.truststore.certificates****Type:** password**Default:** null**Importance:** high

Trusted certificates in the format specified by 'ssl.truststore.type'. Default SSL engine factory supports only PEM format with X.509 certificates.

**ssl.truststore.location****Type:** string**Default:** null**Importance:** high

The location of the trust store file.

**ssl.truststore.password****Type:** password**Default:** null**Importance:** high

The password for the trust store file. If a password is not set, trust store file configured will still be used, but integrity checking is disabled. Trust store password is not supported for PEM format.

**allow.auto.create.topics****Type:** boolean**Default:** true**Importance:** medium

Allow automatic topic creation on the broker when subscribing to or assigning a topic. A topic being subscribed to will be automatically created only if the broker allows for it using **auto.create.topics.enable** broker configuration. This configuration must be set to **false** when using brokers older than 0.11.0.

**auto.offset.reset****Type:** string**Default:** latest**Valid Values:** [latest, earliest, none]**Importance:** medium

What to do when there is no initial offset in Kafka or if the current offset does not exist any more on the server (e.g. because that data has been deleted):

- earliest: automatically reset the offset to the earliest offset
- latest: automatically reset the offset to the latest offset
- none: throw exception to the consumer if no previous offset is found for the consumer's group
- anything else: throw exception to the consumer.

Note that altering partition numbers while setting this config to latest may cause message delivery loss since producers could start to send messages to newly added partitions (i.e. no initial offsets exist yet) before consumers reset their offsets.

### **client.dns.lookup**

**Type:** string

**Default:** use\_all\_dns\_ips

**Valid Values:** [use\_all\_dns\_ips, resolve\_canonical\_bootstrap\_servers\_only]

**Importance:** medium

Controls how the client uses DNS lookups. If set to **use\_all\_dns\_ips**, connect to each returned IP address in sequence until a successful connection is established. After a disconnection, the next IP is used. Once all IPs have been used once, the client resolves the IP(s) from the hostname again (both the JVM and the OS cache DNS name lookups, however). If set to **resolve\_canonical\_bootstrap\_servers\_only**, resolve each bootstrap address into a list of canonical names. After the bootstrap phase, this behaves the same as **use\_all\_dns\_ips**.

### **connections.max.idle.ms**

**Type:** long

**Default:** 540000 (9 minutes)

**Importance:** medium

Close idle connections after the number of milliseconds specified by this config.

### **default.api.timeout.ms**

**Type:** int

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Importance:** medium

Specifies the timeout (in milliseconds) for client APIs. This configuration is used as the default timeout for all client operations that do not specify a **timeout** parameter.

### **enable.auto.commit**

**Type:** boolean

**Default:** true

**Importance:** medium

If true the consumer's offset will be periodically committed in the background.

### **exclude.internal.topics**

**Type:** boolean

**Default:** true

**Importance:** medium

Whether internal topics matching a subscribed pattern should be excluded from the subscription. It is always possible to explicitly subscribe to an internal topic.

### **fetch.max.bytes**

**Type:** int

**Default:** 52428800 (50 mebibytes)

**Valid Values:** [0,...]

**Importance:** medium

The maximum amount of data the server should return for a fetch request. Records are fetched in batches by the consumer, and if the first record batch in the first non-empty partition of the fetch is larger than this value, the record batch will still be returned to ensure that the consumer can make

progress. As such, this is not an absolute maximum. The maximum record batch size accepted by the broker is defined via **message.max.bytes** (broker config) or **max.message.bytes** (topic config). Note that the consumer performs multiple fetches in parallel.

### group.instance.id

**Type:** string

**Default:** null

**Valid Values:** non-empty string

**Importance:** medium

A unique identifier of the consumer instance provided by the end user. Only non-empty strings are permitted. If set, the consumer is treated as a static member, which means that only one instance with this ID is allowed in the consumer group at any time. This can be used in combination with a larger session timeout to avoid group rebalances caused by transient unavailability (e.g. process restarts). If not set, the consumer will join the group as a dynamic member, which is the traditional behavior.

### isolation.level

**Type:** string

**Default:** read\_uncommitted

**Valid Values:** [read\_committed, read\_uncommitted]

**Importance:** medium

Controls how to read messages written transactionally. If set to **read\_committed**, `consumer.poll()` will only return transactional messages which have been committed. If set to **read\_uncommitted** (the default), `consumer.poll()` will return all messages, even transactional messages which have been aborted. Non-transactional messages will be returned unconditionally in either mode.

Messages will always be returned in offset order. Hence, in **read\_committed** mode, `consumer.poll()` will only return messages up to the last stable offset (LSO), which is the one less than the offset of the first open transaction. In particular any messages appearing after messages belonging to ongoing transactions will be withheld until the relevant transaction has been completed. As a result, **read\_committed** consumers will not be able to read up to the high watermark when there are in flight transactions.

Further, when in `read_committed` the `seekToEnd` method will return the LSO.

### max.poll.interval.ms

**Type:** int

**Default:** 300000 (5 minutes)

**Valid Values:** [1,...]

**Importance:** medium

The maximum delay between invocations of `poll()` when using consumer group management. This places an upper bound on the amount of time that the consumer can be idle before fetching more records. If `poll()` is not called before expiration of this timeout, then the consumer is considered failed and the group will rebalance in order to reassign the partitions to another member. For consumers using a non-null **group.instance.id** which reach this timeout, partitions will not be immediately reassigned. Instead, the consumer will stop sending heartbeats and partitions will be reassigned after expiration of **session.timeout.ms**. This mirrors the behavior of a static consumer which has shutdown.

### max.poll.records

**Type:** int

**Default:** 500

**Valid Values:** [1,...]

**Importance:** medium

The maximum number of records returned in a single call to `poll()`. Note, that **max.poll.records** does not impact the underlying fetching behavior. The consumer will cache the records from each fetch request and returns them incrementally from each poll.

### **partition.assignment.strategy**

**Type:** list

**Default:** class `org.apache.kafka.clients.consumer.RangeAssignor`, class `org.apache.kafka.clients.consumer.CooperativeStickyAssignor`

**Valid Values:** non-null string

**Importance:** medium

A list of class names or class types, ordered by preference, of supported partition assignment strategies that the client will use to distribute partition ownership amongst consumer instances when group management is used. Available options are:

- **org.apache.kafka.clients.consumer.RangeAssignor:** Assigns partitions on a per-topic basis.
- **org.apache.kafka.clients.consumer.RoundRobinAssignor:** Assigns partitions to consumers in a round-robin fashion.
- **org.apache.kafka.clients.consumer.StickyAssignor:** Guarantees an assignment that is maximally balanced while preserving as many existing partition assignments as possible.
- **org.apache.kafka.clients.consumer.CooperativeStickyAssignor:** Follows the same `StickyAssignor` logic, but allows for cooperative rebalancing. The default assignor is [`RangeAssignor`, `CooperativeStickyAssignor`], which will use the `RangeAssignor` by default, but allows upgrading to the `CooperativeStickyAssignor` with just a single rolling bounce that removes the `RangeAssignor` from the list.

Implementing the **org.apache.kafka.clients.consumer.ConsumerPartitionAssignor** interface allows you to plug in a custom assignment strategy.

### **receive.buffer.bytes**

**Type:** int

**Default:** 65536 (64 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP receive buffer (`SO_RCVBUF`) to use when reading data. If the value is -1, the OS default will be used.

### **request.timeout.ms**

**Type:** int

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** medium

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted.

### **sasl.client.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL client callback handler class that implements the `AuthenticateCallbackHandler` interface.

### **sasl.jaas.config**

**Type:** password

**Default:** null

**Importance:** medium

JAAS login context parameters for SASL connections in the format used by JAAS configuration files. JAAS configuration file format is described [here](#). The format for the value is: **loginModuleClass controlFlag (optionName=optionValue)\***; For brokers, the config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.jaas.config=com.example.ScramLoginModule` required;

### **sasl.kerberos.service.name**

**Type:** string

**Default:** null

**Importance:** medium

The Kerberos principal name that Kafka runs as. This can be defined either in Kafka's JAAS config or in Kafka's config.

### **sasl.login.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL login callback handler class that implements the `AuthenticateCallbackHandler` interface. For brokers, login callback handler config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.login.callback.handler.class=com.example.CustomScramLoginCallbackHandler`.

### **sasl.login.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a class that implements the `Login` interface. For brokers, login config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.login.class=com.example.CustomScramLogin`.

### **sasl.mechanism**

**Type:** string

**Default:** GSSAPI

**Importance:** medium

SASL mechanism used for client connections. This may be any mechanism for which a security provider is available. GSSAPI is the default mechanism.

### **sasl.oauthbearer.jwks.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The OAuth/OIDC provider URL from which the provider's [JWKS \(JSON Web Key Set\)](#) can be retrieved. The URL can be HTTP(S)-based or file-based. If the URL is HTTP(S)-based, the JWKS data will be retrieved from the OAuth/OIDC provider via the configured URL on broker startup. All then-current keys will be cached on the broker for incoming requests. If an authentication request is received for a JWT that includes a "kid" header claim value that isn't yet in the cache, the JWKS endpoint will be queried again on demand. However, the broker polls the URL every `sasl.oauthbearer.jwks.endpoint.refresh.ms` milliseconds to refresh the cache with any forthcoming keys before any JWT requests that include them are received. If the URL is file-based, the broker will load the JWKS file from a configured location on startup. In the event that the JWT includes a "kid" header value that isn't in the JWKS file, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.token.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The URL for the OAuth/OIDC identity provider. If the URL is HTTP(S)-based, it is the issuer's token endpoint URL to which requests will be made to login based on the configuration in `sasl.jaas.config`. If the URL is file-based, it specifies a file containing an access token (in JWT serialized form) issued by the OAuth/OIDC identity provider to use for authorization.

### **security.protocol**

**Type:** string

**Default:** PLAINTEXT

**Valid Values:** (case insensitive) [SASL\_SSL, PLAINTEXT, SSL, SASL\_PLAINTEXT]

**Importance:** medium

Protocol used to communicate with brokers. Valid values are: PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL.

### **send.buffer.bytes**

**Type:** int

**Default:** 131072 (128 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP send buffer (SO\_SNDBUF) to use when sending data. If the value is -1, the OS default will be used.

### **socket.connection.setup.timeout.max.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Importance:** medium

The maximum amount of time the client will wait for the socket connection to be established. The connection setup timeout will increase exponentially for each consecutive connection failure up to this maximum. To avoid connection storms, a randomization factor of 0.2 will be applied to the timeout resulting in a random range between 20% below and 20% above the computed value.

### **socket.connection.setup.timeout.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** medium

The amount of time the client will wait for the socket connection to be established. If the connection is not built before the timeout elapses, clients will close the socket channel.

### ssl.enabled.protocols

**Type:** list

**Default:** TLSv1.2,TLSv1.3

**Importance:** medium

The list of protocols enabled for SSL connections. The default is 'TLSv1.2,TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. With the default value for Java 11, clients and servers will prefer TLSv1.3 if both support it and fallback to TLSv1.2 otherwise (assuming both support at least TLSv1.2). This default should be fine for most cases. Also see the config documentation for **ssl.protocol**.

### ssl.keystore.type

**Type:** string

**Default:** JKS

**Importance:** medium

The file format of the key store file. This is optional for client. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

### ssl.protocol

**Type:** string

**Default:** TLSv1.3

**Importance:** medium

The SSL protocol used to generate the SSLContext. The default is 'TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. This value should be fine for most use cases. Allowed values in recent JVMs are 'TLSv1.2' and 'TLSv1.3'. 'TLS', 'TLSv1.1', 'SSL', 'SSLv2' and 'SSLv3' may be supported in older JVMs, but their usage is discouraged due to known security vulnerabilities. With the default value for this config and 'ssl.enabled.protocols', clients will downgrade to 'TLSv1.2' if the server does not support 'TLSv1.3'. If this config is set to 'TLSv1.2', clients will not use 'TLSv1.3' even if it is one of the values in ssl.enabled.protocols and the server only supports 'TLSv1.3'.

### ssl.provider

**Type:** string

**Default:** null

**Importance:** medium

The name of the security provider used for SSL connections. Default value is the default security provider of the JVM.

### ssl.truststore.type

**Type:** string

**Default:** JKS

**Importance:** medium

The file format of the trust store file. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

### auto.commit.interval.ms

**Type:** int

**Default:** 5000 (5 seconds)

**Valid Values:** [0,...]

**Importance:** low

The frequency in milliseconds that the consumer offsets are auto-committed to Kafka if **enable.auto.commit** is set to **true**.

### auto.include.jmx.reporter

**Type:** boolean

**Default:** true

**Importance:** low

Deprecated. Whether to automatically include JmxReporter even if it's not listed in **metric.reporters**. This configuration will be removed in Kafka 4.0, users should instead include **org.apache.kafka.common.metrics.JmxReporter** in **metric.reporters** in order to enable the JmxReporter.

### check.crcs

**Type:** boolean

**Default:** true

**Importance:** low

Automatically check the CRC32 of the records consumed. This ensures no on-the-wire or on-disk corruption to the messages occurred. This check adds some overhead, so it may be disabled in cases seeking extreme performance.

### client.id

**Type:** string

**Default:** ""

**Importance:** low

An id string to pass to the server when making requests. The purpose of this is to be able to track the source of requests beyond just ip/port by allowing a logical application name to be included in server-side request logging.

### client.rack

**Type:** string

**Default:** ""

**Importance:** low

A rack identifier for this client. This can be any string value which indicates where this client is physically located. It corresponds with the broker config 'broker.rack'.

### fetch.max.wait.ms

**Type:** int

**Default:** 500

**Valid Values:** [0,...]

**Importance:** low

The maximum amount of time the server will block before answering the fetch request if there isn't sufficient data to immediately satisfy the requirement given by fetch.min.bytes.

### interceptor.classes

**Type:** list

**Default:** ""

**Valid Values:** non-null string

**Importance:** low

A list of classes to use as interceptors. Implementing the **org.apache.kafka.clients.consumer.ConsumerInterceptor** interface allows you to intercept (and possibly mutate) records received by the consumer. By default, there are no interceptors.

### metadata.max.age.ms

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...]



**Importance:** low

The period of time in milliseconds after which we force a refresh of metadata even if we haven't seen any partition leadership changes to proactively discover any new brokers or partitions.

### **metric.reporters**

**Type:** list

**Default:** ""

**Valid Values:** non-null string

**Importance:** low

A list of classes to use as metrics reporters. Implementing the **org.apache.kafka.common.metrics.MetricsReporter** interface allows plugging in classes that will be notified of new metric creation. The JmxReporter is always included to register JMX statistics.

### **metrics.num.samples**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** low

The number of samples maintained to compute metrics.

### **metrics.recording.level**

**Type:** string

**Default:** INFO

**Valid Values:** [INFO, DEBUG, TRACE]

**Importance:** low

The highest recording level for metrics.

### **metrics.sample.window.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The window of time a metrics sample is computed over.

### **reconnect.backoff.max.ms**

**Type:** long

**Default:** 1000 (1 second)

**Valid Values:** [0,...]

**Importance:** low

The maximum amount of time in milliseconds to wait when reconnecting to a broker that has repeatedly failed to connect. If provided, the backoff per host will increase exponentially for each consecutive connection failure, up to this maximum. After calculating the backoff increase, 20% random jitter is added to avoid connection storms.

### **reconnect.backoff.ms**

**Type:** long

**Default:** 50

**Valid Values:** [0,...]

**Importance:** low

The base amount of time to wait before attempting to reconnect to a given host. This avoids repeatedly connecting to a host in a tight loop. This backoff applies to all connection attempts by the client to a broker.

**retry.backoff.ms****Type:** long**Default:** 100**Valid Values:** [0,...]**Importance:** low

The amount of time to wait before attempting to retry a failed request to a given topic partition. This avoids repeatedly sending requests in a tight loop under some failure scenarios.

**sasl.kerberos.kinit.cmd****Type:** string**Default:** /usr/bin/kinit**Importance:** low

Kerberos kinit command path.

**sasl.kerberos.min.time.before.relogin****Type:** long**Default:** 60000**Importance:** low

Login thread sleep time between refresh attempts.

**sasl.kerberos.ticket.renew.jitter****Type:** double**Default:** 0.05**Importance:** low

Percentage of random jitter added to the renewal time.

**sasl.kerberos.ticket.renew.window.factor****Type:** double**Default:** 0.8**Importance:** low

Login thread will sleep until the specified window factor of time from last refresh to ticket's expiry has been reached, at which time it will try to renew the ticket.

**sasl.login.connect.timeout.ms****Type:** int**Default:** null**Importance:** low

The (optional) value in milliseconds for the external authentication provider connection timeout. Currently applies only to OAUTHBEARER.

**sasl.login.read.timeout.ms****Type:** int**Default:** null**Importance:** low

The (optional) value in milliseconds for the external authentication provider read timeout. Currently applies only to OAUTHBEARER.

**sasl.login.refresh.buffer.seconds****Type:** short**Default:** 300**Valid Values:** [0,...,3600]

**Importance:** low

The amount of buffer time before credential expiration to maintain when refreshing a credential, in seconds. If a refresh would otherwise occur closer to expiration than the number of buffer seconds then the refresh will be moved up to maintain as much of the buffer time as possible. Legal values are between 0 and 3600 (1 hour); a default value of 300 (5 minutes) is used if no value is specified. This value and `sasl.login.refresh.min.period.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

**sasl.login.refresh.min.period.seconds****Type:** short**Default:** 60**Valid Values:** [0,...,900]**Importance:** low

The desired minimum time for the login refresh thread to wait before refreshing a credential, in seconds. Legal values are between 0 and 900 (15 minutes); a default value of 60 (1 minute) is used if no value is specified. This value and `sasl.login.refresh.buffer.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

**sasl.login.refresh.window.factor****Type:** double**Default:** 0.8**Valid Values:** [0.5,...,1.0]**Importance:** low

Login refresh thread will sleep until the specified window factor relative to the credential's lifetime has been reached, at which time it will try to refresh the credential. Legal values are between 0.5 (50%) and 1.0 (100%) inclusive; a default value of 0.8 (80%) is used if no value is specified. Currently applies only to OAUTHBEARER.

**sasl.login.refresh.window.jitter****Type:** double**Default:** 0.05**Valid Values:** [0.0,...,0.25]**Importance:** low

The maximum amount of random jitter relative to the credential's lifetime that is added to the login refresh thread's sleep time. Legal values are between 0 and 0.25 (25%) inclusive; a default value of 0.05 (5%) is used if no value is specified. Currently applies only to OAUTHBEARER.

**sasl.login.retry.backoff.max.ms****Type:** long**Default:** 10000 (10 seconds)**Importance:** low

The (optional) value in milliseconds for the maximum wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

**sasl.login.retry.backoff.ms****Type:** long**Default:** 100**Importance:** low

The (optional) value in milliseconds for the initial wait between login attempts to the external

authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

#### **`sasl.oauthbearer.clock.skew.seconds`**

**Type:** int

**Default:** 30

**Importance:** low

The (optional) value in seconds to allow for differences between the time of the OAuth/OIDC identity provider and the broker.

#### **`sasl.oauthbearer.expected.audience`**

**Type:** list

**Default:** null

**Importance:** low

The (optional) comma-delimited setting for the broker to use to verify that the JWT was issued for one of the expected audiences. The JWT will be inspected for the standard OAuth "aud" claim and if this value is set, the broker will match the value from JWT's "aud" claim to see if there is an exact match. If there is no match, the broker will reject the JWT and authentication will fail.

#### **`sasl.oauthbearer.expected.issuer`**

**Type:** string

**Default:** null

**Importance:** low

The (optional) setting for the broker to use to verify that the JWT was created by the expected issuer. The JWT will be inspected for the standard OAuth "iss" claim and if this value is set, the broker will match it exactly against what is in the JWT's "iss" claim. If there is no match, the broker will reject the JWT and authentication will fail.

#### **`sasl.oauthbearer.jwks.endpoint.refresh.ms`**

**Type:** long

**Default:** 3600000 (1 hour)

**Importance:** low

The (optional) value in milliseconds for the broker to wait between refreshing its JWKS (JSON Web Key Set) cache that contains the keys to verify the signature of the JWT.

#### **`sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms`**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

The (optional) value in milliseconds for the maximum wait between attempts to retrieve the JWKS (JSON Web Key Set) from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

#### **`sasl.oauthbearer.jwks.endpoint.retry.backoff.ms`**

**Type:** long

**Default:** 100

**Importance:** low

The (optional) value in milliseconds for the initial wait between JWKS (JSON Web Key Set) retrieval

attempts from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.scope.claim.name**

**Type:** string

**Default:** scope

**Importance:** low

The OAuth claim for the scope is often named "scope", but this (optional) setting can provide a different name to use for the scope included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **sasl.oauthbearer.sub.claim.name**

**Type:** string

**Default:** sub

**Importance:** low

The OAuth claim for the subject is often named "sub", but this (optional) setting can provide a different name to use for the subject included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **security.providers**

**Type:** string

**Default:** null

**Importance:** low

A list of configurable creator classes each returning a provider implementing security algorithms. These classes should implement the **org.apache.kafka.common.security.auth.SecurityProviderCreator** interface.

### **ssl.cipher.suites**

**Type:** list

**Default:** null

**Importance:** low

A list of cipher suites. This is a named combination of authentication, encryption, MAC and key exchange algorithm used to negotiate the security settings for a network connection using TLS or SSL network protocol. By default all the available cipher suites are supported.

### **ssl.endpoint.identification.algorithm**

**Type:** string

**Default:** https

**Importance:** low

The endpoint identification algorithm to validate server hostname using server certificate.

### **ssl.engine.factory.class**

**Type:** class

**Default:** null

**Importance:** low

The class of type `org.apache.kafka.common.security.auth.SslEngineFactory` to provide `SSL`Engine objects. Default value is `org.apache.kafka.common.security.ssl.DefaultSslEngineFactory`.

### **ssl.keymanager.algorithm**

**Type:** string

**Default:** SunX509

**Importance:** low

The algorithm used by key manager factory for SSL connections. Default value is the key manager factory algorithm configured for the Java Virtual Machine.

### **ssl.secure.random.implementation**

**Type:** string

**Default:** null

**Importance:** low

The SecureRandom PRNG implementation to use for SSL cryptography operations.

### **ssl.trustmanager.algorithm**

**Type:** string

**Default:** PKIX

**Importance:** low

The algorithm used by trust manager factory for SSL connections. Default value is the trust manager factory algorithm configured for the Java Virtual Machine.

## CHAPTER 4. PRODUCER CONFIGURATION PROPERTIES

### key.serializer

**Type:** class

**Importance:** high

Serializer class for key that implements the `org.apache.kafka.common.serialization.Serializer` interface.

### value.serializer

**Type:** class

**Importance:** high

Serializer class for value that implements the `org.apache.kafka.common.serialization.Serializer` interface.

### bootstrap.servers

**Type:** list

**Default:** ""

**Valid Values:** non-null string

**Importance:** high

A list of host/port pairs to use for establishing the initial connection to the Kafka cluster. The client will make use of all servers irrespective of which servers are specified here for bootstrapping—this list only impacts the initial hosts used to discover the full set of servers. This list should be in the form **host1:port1,host2:port2,...** Since these servers are just used for the initial connection to discover the full cluster membership (which may change dynamically), this list need not contain the full set of servers (you may want more than one, though, in case a server is down).

### buffer.memory

**Type:** long

**Default:** 33554432

**Valid Values:** [0,...]

**Importance:** high

The total bytes of memory the producer can use to buffer records waiting to be sent to the server. If records are sent faster than they can be delivered to the server the producer will block for **max.block.ms** after which it will throw an exception.

This setting should correspond roughly to the total memory the producer will use, but is not a hard bound since not all memory the producer uses is used for buffering. Some additional memory will be used for compression (if compression is enabled) as well as for maintaining in-flight requests.

### compression.type

**Type:** string

**Default:** none

**Valid Values:** [none, gzip, snappy, lz4, zstd]

**Importance:** high

The compression type for all data generated by the producer. The default is none (i.e. no compression). Valid values are **none**, **gzip**, **snappy**, **lz4**, or **zstd**. Compression is of full batches of data, so the efficacy of batching will also impact the compression ratio (more batching means better compression).

### retries

**Type:** int

**Default:** 2147483647

**Valid Values:** [0,...,2147483647]

**Importance:** high

Setting a value greater than zero will cause the client to resend any record whose send fails with a potentially transient error. Note that this retry is no different than if the client resent the record upon receiving the error. Produce requests will be failed before the number of retries has been exhausted if the timeout configured by **delivery.timeout.ms** expires first before successful acknowledgement. Users should generally prefer to leave this config unset and instead use **delivery.timeout.ms** to control retry behavior.

Enabling idempotence requires this config value to be greater than 0. If conflicting configurations are set and idempotence is not explicitly enabled, idempotence is disabled.

Allowing retries while setting **enable.idempotence** to **false** and **max.in.flight.requests.per.connection** to greater than 1 will potentially change the ordering of records because if two batches are sent to a single partition, and the first fails and is retried but the second succeeds, then the records in the second batch may appear first.

### **ssl.key.password**

**Type:** password

**Default:** null

**Importance:** high

The password of the private key in the key store file or the PEM key specified in 'ssl.keystore.key'.

### **ssl.keystore.certificate.chain**

**Type:** password

**Default:** null

**Importance:** high

Certificate chain in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with a list of X.509 certificates.

### **ssl.keystore.key**

**Type:** password

**Default:** null

**Importance:** high

Private key in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with PKCS#8 keys. If the key is encrypted, key password must be specified using 'ssl.key.password'.

### **ssl.keystore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the key store file. This is optional for client and can be used for two-way authentication for client.

### **ssl.keystore.password**

**Type:** password

**Default:** null

**Importance:** high

The store password for the key store file. This is optional for client and only needed if 'ssl.keystore.location' is configured. Key store password is not supported for PEM format.



**ssl.truststore.certificates**

**Type:** password

**Default:** null

**Importance:** high

Trusted certificates in the format specified by 'ssl.truststore.type'. Default SSL engine factory supports only PEM format with X.509 certificates.

**ssl.truststore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the trust store file.

**ssl.truststore.password**

**Type:** password

**Default:** null

**Importance:** high

The password for the trust store file. If a password is not set, trust store file configured will still be used, but integrity checking is disabled. Trust store password is not supported for PEM format.

**batch.size**

**Type:** int

**Default:** 16384

**Valid Values:** [0,...]

**Importance:** medium

The producer will attempt to batch records together into fewer requests whenever multiple records are being sent to the same partition. This helps performance on both the client and the server. This configuration controls the default batch size in bytes.

No attempt will be made to batch records larger than this size.

Requests sent to brokers will contain multiple batches, one for each partition with data available to be sent.

A small batch size will make batching less common and may reduce throughput (a batch size of zero will disable batching entirely). A very large batch size may use memory a bit more wastefully as we will always allocate a buffer of the specified batch size in anticipation of additional records.

Note: This setting gives the upper bound of the batch size to be sent. If we have fewer than this many bytes accumulated for this partition, we will 'linger' for the **linger.ms** time waiting for more records to show up. This **linger.ms** setting defaults to 0, which means we'll immediately send out a record even the accumulated batch size is under this **batch.size** setting.

**client.dns.lookup**

**Type:** string

**Default:** use\_all\_dns\_ips

**Valid Values:** [use\_all\_dns\_ips, resolve\_canonical\_bootstrap\_servers\_only]

**Importance:** medium

Controls how the client uses DNS lookups. If set to **use\_all\_dns\_ips**, connect to each returned IP address in sequence until a successful connection is established. After a disconnection, the next IP is used. Once all IPs have been used once, the client resolves the IP(s) from the hostname again (both

the JVM and the OS cache DNS name lookups, however). If set to **resolve\_canonical\_bootstrap\_servers\_only**, resolve each bootstrap address into a list of canonical names. After the bootstrap phase, this behaves the same as **use\_all\_dns\_ips**.

### client.id

**Type:** string

**Default:** ""

**Importance:** medium

An id string to pass to the server when making requests. The purpose of this is to be able to track the source of requests beyond just ip/port by allowing a logical application name to be included in server-side request logging.

### connections.max.idle.ms

**Type:** long

**Default:** 540000 (9 minutes)

**Importance:** medium

Close idle connections after the number of milliseconds specified by this config.

### delivery.timeout.ms

**Type:** int

**Default:** 120000 (2 minutes)

**Valid Values:** [0,...]

**Importance:** medium

An upper bound on the time to report success or failure after a call to **send()** returns. This limits the total time that a record will be delayed prior to sending, the time to await acknowledgement from the broker (if expected), and the time allowed for retrievable send failures. The producer may report failure to send a record earlier than this config if either an unrecoverable error is encountered, the retries have been exhausted, or the record is added to a batch which reached an earlier delivery expiration deadline. The value of this config should be greater than or equal to the sum of **request.timeout.ms** and **linger.ms**.

### linger.ms

**Type:** long

**Default:** 0

**Valid Values:** [0,...]

**Importance:** medium

The producer groups together any records that arrive in between request transmissions into a single batched request. Normally this occurs only under load when records arrive faster than they can be sent out. However in some circumstances the client may want to reduce the number of requests even under moderate load. This setting accomplishes this by adding a small amount of artificial delay—that is, rather than immediately sending out a record, the producer will wait for up to the given delay to allow other records to be sent so that the sends can be batched together. This can be thought of as analogous to Nagle's algorithm in TCP. This setting gives the upper bound on the delay for batching: once we get **batch.size** worth of records for a partition it will be sent immediately regardless of this setting, however if we have fewer than this many bytes accumulated for this partition we will 'linger' for the specified time waiting for more records to show up. This setting defaults to 0 (i.e. no delay). Setting **linger.ms=5**, for example, would have the effect of reducing the number of requests sent but would add up to 5ms of latency to records sent in the absence of load.

### max.block.ms

**Type:** long

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Importance:** medium

The configuration controls how long the **KafkaProducer's** `send()`, `partitionsFor()`, `initTransactions()`, `sendOffsetsToTransaction()`, `commitTransaction()` and `abortTransaction()` methods will block. For `send()` this timeout bounds the total time waiting for both metadata fetch and buffer allocation (blocking in the user-supplied serializers or partitioner is not counted against this timeout). For `partitionsFor()` this timeout bounds the time spent waiting for metadata if it is unavailable. The transaction-related methods always block, but may timeout if the transaction coordinator could not be discovered or did not respond within the timeout.

### **max.request.size**

**Type:** int

**Default:** 1048576

**Valid Values:** [0,...]

**Importance:** medium

The maximum size of a request in bytes. This setting will limit the number of record batches the producer will send in a single request to avoid sending huge requests. This is also effectively a cap on the maximum uncompressed record batch size. Note that the server has its own cap on the record batch size (after compression if compression is enabled) which may be different from this.

### **partitioner.class**

**Type:** class

**Default:** null

**Importance:** medium

Determines which partition to send a record to when records are produced. Available options are:

- If not set, the default partitioning logic is used. This strategy send records to a partition until at least `batch.size` bytes is produced to the partition. It works with the strategy:

1) If no partition is specified but a key is present, choose a partition based on a hash of the key.

2) If no partition or key is present, choose the sticky partition that changes when at least `batch.size` bytes are produced to the partition.

\* `org.apache.kafka.clients.producer.RoundRobinPartitioner``: A partitioning strategy where each record in a series of consecutive records is sent to a different partition, regardless of whether the 'key' is provided or not, until partitions run out and the process starts over again. Note: There's a known issue that will cause uneven distribution when a new batch is created. See KAFKA-9965 for more detail.

Implementing the **org.apache.kafka.clients.producer.Partitioner** interface allows you to plug in a custom partitioner.

### **partitioner.ignore.keys**

**Type:** boolean

**Default:** false

**Importance:** medium

When set to 'true' the producer won't use record keys to choose a partition. If 'false', producer would choose a partition based on a hash of the key when a key is present. Note: this setting has no effect if a custom partitioner is used.

### **receive.buffer.bytes**

**Type:** int

**Default:** 32768 (32 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP receive buffer (SO\_RCVBUF) to use when reading data. If the value is -1, the OS default will be used.

### **request.timeout.ms**

**Type:** int

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** medium

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted. This should be larger than

**replica.lag.time.max.ms** (a broker configuration) to reduce the possibility of message duplication due to unnecessary producer retries.

### **sasl.client.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL client callback handler class that implements the AuthenticateCallbackHandler interface.

### **sasl.jaas.config**

**Type:** password

**Default:** null

**Importance:** medium

JAAS login context parameters for SASL connections in the format used by JAAS configuration files. JAAS configuration file format is described [here](#). The format for the value is: **loginModuleClass controlFlag (optionName=optionValue)\***; For brokers, the config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.jaas.config=com.example.ScramLoginModule required;

### **sasl.kerberos.service.name**

**Type:** string

**Default:** null

**Importance:** medium

The Kerberos principal name that Kafka runs as. This can be defined either in Kafka's JAAS config or in Kafka's config.

### **sasl.login.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL login callback handler class that implements the AuthenticateCallbackHandler interface. For brokers, login callback handler config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example,

listener.name.sasl\_ssl.scram-sha-

256.sasl.login.callback.handler.class=com.example.CustomScramLoginCallbackHandler.

### **sasl.login.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a class that implements the Login interface. For brokers, login config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.login.class=com.example.CustomScramLogin`.

### **sasl.mechanism**

**Type:** string

**Default:** GSSAPI

**Importance:** medium

SASL mechanism used for client connections. This may be any mechanism for which a security provider is available. GSSAPI is the default mechanism.

### **sasl.oauthbearer.jwks.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The OAuth/OIDC provider URL from which the provider's [JWKS \(JSON Web Key Set\)](#) can be retrieved. The URL can be HTTP(S)-based or file-based. If the URL is HTTP(S)-based, the JWKS data will be retrieved from the OAuth/OIDC provider via the configured URL on broker startup. All then-current keys will be cached on the broker for incoming requests. If an authentication request is received for a JWT that includes a "kid" header claim value that isn't yet in the cache, the JWKS endpoint will be queried again on demand. However, the broker polls the URL every `sasl.oauthbearer.jwks.endpoint.refresh.ms` milliseconds to refresh the cache with any forthcoming keys before any JWT requests that include them are received. If the URL is file-based, the broker will load the JWKS file from a configured location on startup. In the event that the JWT includes a "kid" header value that isn't in the JWKS file, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.token.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The URL for the OAuth/OIDC identity provider. If the URL is HTTP(S)-based, it is the issuer's token endpoint URL to which requests will be made to login based on the configuration in `sasl.jaas.config`. If the URL is file-based, it specifies a file containing an access token (in JWT serialized form) issued by the OAuth/OIDC identity provider to use for authorization.

### **security.protocol**

**Type:** string

**Default:** PLAINTEXT

**Valid Values:** (case insensitive) [SASL\_SSL, PLAINTEXT, SSL, SASL\_PLAINTEXT]

**Importance:** medium

Protocol used to communicate with brokers. Valid values are: PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL.

### **send.buffer.bytes**

**Type:** int

**Default:** 131072 (128 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP send buffer (SO\_SNDBUF) to use when sending data. If the value is -1, the OS default will be used.

**socket.connection.setup.timeout.max.ms****Type:** long**Default:** 30000 (30 seconds)**Importance:** medium

The maximum amount of time the client will wait for the socket connection to be established. The connection setup timeout will increase exponentially for each consecutive connection failure up to this maximum. To avoid connection storms, a randomization factor of 0.2 will be applied to the timeout resulting in a random range between 20% below and 20% above the computed value.

**socket.connection.setup.timeout.ms****Type:** long**Default:** 10000 (10 seconds)**Importance:** medium

The amount of time the client will wait for the socket connection to be established. If the connection is not built before the timeout elapses, clients will close the socket channel.

**ssl.enabled.protocols****Type:** list**Default:** TLSv1.2,TLSv1.3**Importance:** medium

The list of protocols enabled for SSL connections. The default is 'TLSv1.2,TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. With the default value for Java 11, clients and servers will prefer TLSv1.3 if both support it and fallback to TLSv1.2 otherwise (assuming both support at least TLSv1.2). This default should be fine for most cases. Also see the config documentation for **ssl.protocol**.

**ssl.keystore.type****Type:** string**Default:** JKS**Importance:** medium

The file format of the key store file. This is optional for client. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

**ssl.protocol****Type:** string**Default:** TLSv1.3**Importance:** medium

The SSL protocol used to generate the SSLContext. The default is 'TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. This value should be fine for most use cases. Allowed values in recent JVMs are 'TLSv1.2' and 'TLSv1.3'. 'TLS', 'TLSv1.1', 'SSL', 'SSLv2' and 'SSLv3' may be supported in older JVMs, but their usage is discouraged due to known security vulnerabilities. With the default value for this config and 'ssl.enabled.protocols', clients will downgrade to 'TLSv1.2' if the server does not support 'TLSv1.3'. If this config is set to 'TLSv1.2', clients will not use 'TLSv1.3' even if it is one of the values in ssl.enabled.protocols and the server only supports 'TLSv1.3'.

**ssl.provider****Type:** string**Default:** null**Importance:** medium

The name of the security provider used for SSL connections. Default value is the default security provider of the JVM.

**ssl.truststore.type**

**Type:** string

**Default:** JKS

**Importance:** medium

The file format of the trust store file. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

## acks

**Type:** string

**Default:** all

**Valid Values:** [all, -1, 0, 1]

**Importance:** low

The number of acknowledgments the producer requires the leader to have received before considering a request complete. This controls the durability of records that are sent. The following settings are allowed:

- **acks=0** If set to zero then the producer will not wait for any acknowledgment from the server at all. The record will be immediately added to the socket buffer and considered sent. No guarantee can be made that the server has received the record in this case, and the **retries** configuration will not take effect (as the client won't generally know of any failures). The offset given back for each record will always be set to **-1**.
- **acks=1** This will mean the leader will write the record to its local log but will respond without awaiting full acknowledgement from all followers. In this case should the leader fail immediately after acknowledging the record but before the followers have replicated it then the record will be lost.
- **acks=all** This means the leader will wait for the full set of in-sync replicas to acknowledge the record. This guarantees that the record will not be lost as long as at least one in-sync replica remains alive. This is the strongest available guarantee. This is equivalent to the **acks=-1** setting.  
Note that enabling idempotence requires this config value to be 'all'. If conflicting configurations are set and idempotence is not explicitly enabled, idempotence is disabled.

## auto.include.jmx.reporter

**Type:** boolean

**Default:** true

**Importance:** low

Deprecated. Whether to automatically include JmxReporter even if it's not listed in **metric.reporters**. This configuration will be removed in Kafka 4.0, users should instead include **org.apache.kafka.common.metrics.JmxReporter** in **metric.reporters** in order to enable the JmxReporter.

## enable.idempotence

**Type:** boolean

**Default:** true

**Importance:** low

When set to 'true', the producer will ensure that exactly one copy of each message is written in the stream. If 'false', producer retries due to broker failures, etc., may write duplicates of the retried message in the stream. Note that enabling idempotence requires **max.in.flight.requests.per.connection** to be less than or equal to 5 (with message ordering preserved for any allowable value), **retries** to be greater than 0, and **acks** must be 'all'.

Idempotence is enabled by default if no conflicting configurations are set. If conflicting configurations are set and idempotence is not explicitly enabled, idempotence is disabled. If

idempotence is explicitly enabled and conflicting configurations are set, a **ConfigException** is thrown.

### **interceptor.classes**

**Type:** list

**Default:** ""

**Valid Values:** non-null string

**Importance:** low

A list of classes to use as interceptors. Implementing the **org.apache.kafka.clients.producer.ProducerInterceptor** interface allows you to intercept (and possibly mutate) the records received by the producer before they are published to the Kafka cluster. By default, there are no interceptors.

### **max.in.flight.requests.per.connection**

**Type:** int

**Default:** 5

**Valid Values:** [1,...]

**Importance:** low

The maximum number of unacknowledged requests the client will send on a single connection before blocking. Note that if this configuration is set to be greater than 1 and **enable.idempotence** is set to false, there is a risk of message reordering after a failed send due to retries (i.e., if retries are enabled); if retries are disabled or if **enable.idempotence** is set to true, ordering will be preserved. Additionally, enabling idempotence requires the value of this configuration to be less than or equal to 5. If conflicting configurations are set and idempotence is not explicitly enabled, idempotence is disabled.

### **metadata.max.age.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...]

**Importance:** low

The period of time in milliseconds after which we force a refresh of metadata even if we haven't seen any partition leadership changes to proactively discover any new brokers or partitions.

### **metadata.max.idle.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [5000,...]

**Importance:** low

Controls how long the producer will cache metadata for a topic that's idle. If the elapsed time since a topic was last produced to exceeds the metadata idle duration, then the topic's metadata is forgotten and the next access to it will force a metadata fetch request.

### **metric.reporters**

**Type:** list

**Default:** ""

**Valid Values:** non-null string

**Importance:** low

A list of classes to use as metrics reporters. Implementing the **org.apache.kafka.common.metrics.MetricsReporter** interface allows plugging in classes that will be notified of new metric creation. The JmxReporter is always included to register JMX statistics.



**metrics.num.samples**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** low

The number of samples maintained to compute metrics.

**metrics.recording.level**

**Type:** string

**Default:** INFO

**Valid Values:** [INFO, DEBUG, TRACE]

**Importance:** low

The highest recording level for metrics.

**metrics.sample.window.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The window of time a metrics sample is computed over.

**partitioner.adaptive.partitioning.enable**

**Type:** boolean

**Default:** true

**Importance:** low

When set to 'true', the producer will try to adapt to broker performance and produce more messages to partitions hosted on faster brokers. If 'false', producer will try to distribute messages uniformly.

Note: this setting has no effect if a custom partitioner is used.

**partitioner.availability.timeout.ms**

**Type:** long

**Default:** 0

**Valid Values:** [0,...]

**Importance:** low

If a broker cannot process produce requests from a partition for **partitioner.availability.timeout.ms** time, the partitioner treats that partition as not available. If the value is 0, this logic is disabled. Note: this setting has no effect if a custom partitioner is used or **partitioner.adaptive.partitioning.enable** is set to 'false'.

**reconnect.backoff.max.ms**

**Type:** long

**Default:** 1000 (1 second)

**Valid Values:** [0,...]

**Importance:** low

The maximum amount of time in milliseconds to wait when reconnecting to a broker that has repeatedly failed to connect. If provided, the backoff per host will increase exponentially for each consecutive connection failure, up to this maximum. After calculating the backoff increase, 20% random jitter is added to avoid connection storms.

**reconnect.backoff.ms**

**Type:** long

**Default:** 50

**Valid Values:** [0,...]

**Importance:** low

The base amount of time to wait before attempting to reconnect to a given host. This avoids repeatedly connecting to a host in a tight loop. This backoff applies to all connection attempts by the client to a broker.

### **retry.backoff.ms**

**Type:** long

**Default:** 100

**Valid Values:** [0,...]

**Importance:** low

The amount of time to wait before attempting to retry a failed request to a given topic partition. This avoids repeatedly sending requests in a tight loop under some failure scenarios.

### **sasl.kerberos.kinit.cmd**

**Type:** string

**Default:** /usr/bin/kinit

**Importance:** low

Kerberos kinit command path.

### **sasl.kerberos.min.time.before.relogin**

**Type:** long

**Default:** 60000

**Importance:** low

Login thread sleep time between refresh attempts.

### **sasl.kerberos.ticket.renew.jitter**

**Type:** double

**Default:** 0.05

**Importance:** low

Percentage of random jitter added to the renewal time.

### **sasl.kerberos.ticket.renew.window.factor**

**Type:** double

**Default:** 0.8

**Importance:** low

Login thread will sleep until the specified window factor of time from last refresh to ticket's expiry has been reached, at which time it will try to renew the ticket.

### **sasl.login.connect.timeout.ms**

**Type:** int

**Default:** null

**Importance:** low

The (optional) value in milliseconds for the external authentication provider connection timeout. Currently applies only to OAUTHBEARER.

### **sasl.login.read.timeout.ms**

**Type:** int

**Default:** null

**Importance:** low

The (optional) value in milliseconds for the external authentication provider read timeout. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.buffer.seconds**

**Type:** short

**Default:** 300

**Valid Values:** [0,...,3600]

**Importance:** low

The amount of buffer time before credential expiration to maintain when refreshing a credential, in seconds. If a refresh would otherwise occur closer to expiration than the number of buffer seconds then the refresh will be moved up to maintain as much of the buffer time as possible. Legal values are between 0 and 3600 (1 hour); a default value of 300 (5 minutes) is used if no value is specified. This value and `sasl.login.refresh.min.period.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.min.period.seconds**

**Type:** short

**Default:** 60

**Valid Values:** [0,...,900]

**Importance:** low

The desired minimum time for the login refresh thread to wait before refreshing a credential, in seconds. Legal values are between 0 and 900 (15 minutes); a default value of 60 (1 minute) is used if no value is specified. This value and `sasl.login.refresh.buffer.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.window.factor**

**Type:** double

**Default:** 0.8

**Valid Values:** [0.5,...,1.0]

**Importance:** low

Login refresh thread will sleep until the specified window factor relative to the credential's lifetime has been reached, at which time it will try to refresh the credential. Legal values are between 0.5 (50%) and 1.0 (100%) inclusive; a default value of 0.8 (80%) is used if no value is specified. Currently applies only to OAUTHBEARER.

### **sasl.login.refresh.window.jitter**

**Type:** double

**Default:** 0.05

**Valid Values:** [0.0,...,0.25]

**Importance:** low

The maximum amount of random jitter relative to the credential's lifetime that is added to the login refresh thread's sleep time. Legal values are between 0 and 0.25 (25%) inclusive; a default value of 0.05 (5%) is used if no value is specified. Currently applies only to OAUTHBEARER.

### **sasl.login.retry.backoff.max.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

The (optional) value in milliseconds for the maximum wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum

wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

### **sasl.login.retry.backoff.ms**

**Type:** long

**Default:** 100

**Importance:** low

The (optional) value in milliseconds for the initial wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

### **sasl.oauthbearer.clock.skew.seconds**

**Type:** int

**Default:** 30

**Importance:** low

The (optional) value in seconds to allow for differences between the time of the OAuth/OIDC identity provider and the broker.

### **sasl.oauthbearer.expected.audience**

**Type:** list

**Default:** null

**Importance:** low

The (optional) comma-delimited setting for the broker to use to verify that the JWT was issued for one of the expected audiences. The JWT will be inspected for the standard OAuth "aud" claim and if this value is set, the broker will match the value from JWT's "aud" claim to see if there is an exact match. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.expected.issuer**

**Type:** string

**Default:** null

**Importance:** low

The (optional) setting for the broker to use to verify that the JWT was created by the expected issuer. The JWT will be inspected for the standard OAuth "iss" claim and if this value is set, the broker will match it exactly against what is in the JWT's "iss" claim. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.jwks.endpoint.refresh.ms**

**Type:** long

**Default:** 3600000 (1 hour)

**Importance:** low

The (optional) value in milliseconds for the broker to wait between refreshing its JWKS (JSON Web Key Set) cache that contains the keys to verify the signature of the JWT.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

The (optional) value in milliseconds for the maximum wait between attempts to retrieve the JWKS (JSON Web Key Set) from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms`

setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.ms**

**Type:** long

**Default:** 100

**Importance:** low

The (optional) value in milliseconds for the initial wait between JWKS (JSON Web Key Set) retrieval attempts from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.scope.claim.name**

**Type:** string

**Default:** scope

**Importance:** low

The OAuth claim for the scope is often named "scope", but this (optional) setting can provide a different name to use for the scope included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **sasl.oauthbearer.sub.claim.name**

**Type:** string

**Default:** sub

**Importance:** low

The OAuth claim for the subject is often named "sub", but this (optional) setting can provide a different name to use for the subject included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **security.providers**

**Type:** string

**Default:** null

**Importance:** low

A list of configurable creator classes each returning a provider implementing security algorithms. These classes should implement the

**org.apache.kafka.common.security.auth.SecurityProviderCreator** interface.

### **ssl.cipher.suites**

**Type:** list

**Default:** null

**Importance:** low

A list of cipher suites. This is a named combination of authentication, encryption, MAC and key exchange algorithm used to negotiate the security settings for a network connection using TLS or SSL network protocol. By default all the available cipher suites are supported.

### **ssl.endpoint.identification.algorithm**

**Type:** string

**Default:** https

**Importance:** low

The endpoint identification algorithm to validate server hostname using server certificate.

### **ssl.engine.factory.class**

**Type:** class

**Default:** null

**Importance:** low

The class of type `org.apache.kafka.common.security.auth.SslEngineFactory` to provide `SSL` Engine objects. Default value is `org.apache.kafka.common.security.ssl.DefaultSslEngineFactory`.

### **ssl.keymanager.algorithm**

**Type:** string

**Default:** SunX509

**Importance:** low

The algorithm used by key manager factory for `SSL` connections. Default value is the key manager factory algorithm configured for the Java Virtual Machine.

### **ssl.secure.random.implementation**

**Type:** string

**Default:** null

**Importance:** low

The `SecureRandom` PRNG implementation to use for `SSL` cryptography operations.

### **ssl.trustmanager.algorithm**

**Type:** string

**Default:** PKIX

**Importance:** low

The algorithm used by trust manager factory for `SSL` connections. Default value is the trust manager factory algorithm configured for the Java Virtual Machine.

### **transaction.timeout.ms**

**Type:** int

**Default:** 60000 (1 minute)

**Importance:** low

The maximum amount of time in milliseconds that a transaction will remain open before the coordinator proactively aborts it. The start of the transaction is set at the time that the first partition is added to it. If this value is larger than the **transaction.max.timeout.ms** setting in the broker, the request will fail with a **InvalidTxnTimeoutException** error.

### **transactional.id**

**Type:** string

**Default:** null

**Valid Values:** non-empty string

**Importance:** low

The `TransactionalId` to use for transactional delivery. This enables reliability semantics which span multiple producer sessions since it allows the client to guarantee that transactions using the same `TransactionalId` have been completed prior to starting any new transactions. If no `TransactionalId` is provided, then the producer is limited to idempotent delivery. If a `TransactionalId` is configured, **enable.idempotence** is implied. By default the `TransactionalId` is not configured, which means transactions cannot be used. Note that, by default, transactions require a cluster of at least three brokers which is the recommended setting for production; for development you can change this, by adjusting broker setting **transaction.state.log.replication.factor**.

## CHAPTER 5. ADMIN CLIENT CONFIGURATION PROPERTIES

### **bootstrap.servers**

**Type:** list

**Importance:** high

A list of host/port pairs to use for establishing the initial connection to the Kafka cluster. The client will make use of all servers irrespective of which servers are specified here for bootstrapping—this list only impacts the initial hosts used to discover the full set of servers. This list should be in the form **host1:port1,host2:port2,...** Since these servers are just used for the initial connection to discover the full cluster membership (which may change dynamically), this list need not contain the full set of servers (you may want more than one, though, in case a server is down).

### **ssl.key.password**

**Type:** password

**Default:** null

**Importance:** high

The password of the private key in the key store file or the PEM key specified in 'ssl.keystore.key'.

### **ssl.keystore.certificate.chain**

**Type:** password

**Default:** null

**Importance:** high

Certificate chain in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with a list of X.509 certificates.

### **ssl.keystore.key**

**Type:** password

**Default:** null

**Importance:** high

Private key in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with PKCS#8 keys. If the key is encrypted, key password must be specified using 'ssl.key.password'.

### **ssl.keystore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the key store file. This is optional for client and can be used for two-way authentication for client.

### **ssl.keystore.password**

**Type:** password

**Default:** null

**Importance:** high

The store password for the key store file. This is optional for client and only needed if 'ssl.keystore.location' is configured. Key store password is not supported for PEM format.

### **ssl.truststore.certificates**

**Type:** password

**Default:** null

**Importance:** high

Trusted certificates in the format specified by 'ssl.truststore.type'. Default SSL engine factory supports only PEM format with X.509 certificates.

### **ssl.truststore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the trust store file.

### **ssl.truststore.password**

**Type:** password

**Default:** null

**Importance:** high

The password for the trust store file. If a password is not set, trust store file configured will still be used, but integrity checking is disabled. Trust store password is not supported for PEM format.

### **client.dns.lookup**

**Type:** string

**Default:** use\_all\_dns\_ips

**Valid Values:** [use\_all\_dns\_ips, resolve\_canonical\_bootstrap\_servers\_only]

**Importance:** medium

Controls how the client uses DNS lookups. If set to **use\_all\_dns\_ips**, connect to each returned IP address in sequence until a successful connection is established. After a disconnection, the next IP is used. Once all IPs have been used once, the client resolves the IP(s) from the hostname again (both the JVM and the OS cache DNS name lookups, however). If set to **resolve\_canonical\_bootstrap\_servers\_only**, resolve each bootstrap address into a list of canonical names. After the bootstrap phase, this behaves the same as **use\_all\_dns\_ips**.

### **client.id**

**Type:** string

**Default:** ""

**Importance:** medium

An id string to pass to the server when making requests. The purpose of this is to be able to track the source of requests beyond just ip/port by allowing a logical application name to be included in server-side request logging.

### **connections.max.idle.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Importance:** medium

Close idle connections after the number of milliseconds specified by this config.

### **default.api.timeout.ms**

**Type:** int

**Default:** 60000 (1 minute)

**Valid Values:** [0,...]

**Importance:** medium

Specifies the timeout (in milliseconds) for client APIs. This configuration is used as the default timeout for all client operations that do not specify a **timeout** parameter.

### **receive.buffer.bytes**



**Type:** int

**Default:** 65536 (64 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP receive buffer (SO\_RCVBUF) to use when reading data. If the value is -1, the OS default will be used.

### **request.timeout.ms**

**Type:** int

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** medium

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted.

### **sasl.client.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL client callback handler class that implements the AuthenticateCallbackHandler interface.

### **sasl.jaas.config**

**Type:** password

**Default:** null

**Importance:** medium

JAAS login context parameters for SASL connections in the format used by JAAS configuration files. JAAS configuration file format is described [here](#). The format for the value is: **loginModuleClass controlFlag (optionName=optionValue)\***; For brokers, the config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.jaas.config=com.example.ScramLoginModule required;

### **sasl.kerberos.service.name**

**Type:** string

**Default:** null

**Importance:** medium

The Kerberos principal name that Kafka runs as. This can be defined either in Kafka's JAAS config or in Kafka's config.

### **sasl.login.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL login callback handler class that implements the AuthenticateCallbackHandler interface. For brokers, login callback handler config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.login.callback.handler.class=com.example.CustomScramLoginCallbackHandler.

### **sasl.login.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a class that implements the Login interface. For brokers, login config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, `listener.name.sasl_ssl.scram-sha-256.sasl.login.class=com.example.CustomScramLogin`.

### **sasl.mechanism**

**Type:** string

**Default:** GSSAPI

**Importance:** medium

SASL mechanism used for client connections. This may be any mechanism for which a security provider is available. GSSAPI is the default mechanism.

### **sasl.oauthbearer.jwks.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The OAuth/OIDC provider URL from which the provider's [JWKS \(JSON Web Key Set\)](#) can be retrieved. The URL can be HTTP(S)-based or file-based. If the URL is HTTP(S)-based, the JWKS data will be retrieved from the OAuth/OIDC provider via the configured URL on broker startup. All then-current keys will be cached on the broker for incoming requests. If an authentication request is received for a JWT that includes a "kid" header claim value that isn't yet in the cache, the JWKS endpoint will be queried again on demand. However, the broker polls the URL every `sasl.oauthbearer.jwks.endpoint.refresh.ms` milliseconds to refresh the cache with any forthcoming keys before any JWT requests that include them are received. If the URL is file-based, the broker will load the JWKS file from a configured location on startup. In the event that the JWT includes a "kid" header value that isn't in the JWKS file, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.token.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The URL for the OAuth/OIDC identity provider. If the URL is HTTP(S)-based, it is the issuer's token endpoint URL to which requests will be made to login based on the configuration in `sasl.jaas.config`. If the URL is file-based, it specifies a file containing an access token (in JWT serialized form) issued by the OAuth/OIDC identity provider to use for authorization.

### **security.protocol**

**Type:** string

**Default:** PLAINTEXT

**Valid Values:** (case insensitive) [SASL\_SSL, PLAINTEXT, SSL, SASL\_PLAINTEXT]

**Importance:** medium

Protocol used to communicate with brokers. Valid values are: PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL.

### **send.buffer.bytes**

**Type:** int

**Default:** 131072 (128 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP send buffer (SO\_SNDBUF) to use when sending data. If the value is -1, the OS default will be used.

**socket.connection.setup.timeout.max.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Importance:** medium

The maximum amount of time the client will wait for the socket connection to be established. The connection setup timeout will increase exponentially for each consecutive connection failure up to this maximum. To avoid connection storms, a randomization factor of 0.2 will be applied to the timeout resulting in a random range between 20% below and 20% above the computed value.

**socket.connection.setup.timeout.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** medium

The amount of time the client will wait for the socket connection to be established. If the connection is not built before the timeout elapses, clients will close the socket channel.

**ssl.enabled.protocols**

**Type:** list

**Default:** TLSv1.2,TLSv1.3

**Importance:** medium

The list of protocols enabled for SSL connections. The default is 'TLSv1.2,TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. With the default value for Java 11, clients and servers will prefer TLSv1.3 if both support it and fallback to TLSv1.2 otherwise (assuming both support at least TLSv1.2). This default should be fine for most cases. Also see the config documentation for **ssl.protocol**.

**ssl.keystore.type**

**Type:** string

**Default:** JKS

**Importance:** medium

The file format of the key store file. This is optional for client. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

**ssl.protocol**

**Type:** string

**Default:** TLSv1.3

**Importance:** medium

The SSL protocol used to generate the SSLContext. The default is 'TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. This value should be fine for most use cases. Allowed values in recent JVMs are 'TLSv1.2' and 'TLSv1.3'. 'TLS', 'TLSv1.1', 'SSL', 'SSLv2' and 'SSLv3' may be supported in older JVMs, but their usage is discouraged due to known security vulnerabilities. With the default value for this config and 'ssl.enabled.protocols', clients will downgrade to 'TLSv1.2' if the server does not support 'TLSv1.3'. If this config is set to 'TLSv1.2', clients will not use 'TLSv1.3' even if it is one of the values in ssl.enabled.protocols and the server only supports 'TLSv1.3'.

**ssl.provider**

**Type:** string

**Default:** null

**Importance:** medium

The name of the security provider used for SSL connections. Default value is the default security provider of the JVM.

**ssl.truststore.type**

**Type:** string

**Default:** JKS

**Importance:** medium

The file format of the trust store file. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

### **auto.include.jmx.reporter**

**Type:** boolean

**Default:** true

**Importance:** low

Deprecated. Whether to automatically include JmxReporter even if it's not listed in **metric.reporters**. This configuration will be removed in Kafka 4.0, users should instead include **org.apache.kafka.common.metrics.JmxReporter** in **metric.reporters** in order to enable the JmxReporter.

### **metadata.max.age.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...]

**Importance:** low

The period of time in milliseconds after which we force a refresh of metadata even if we haven't seen any partition leadership changes to proactively discover any new brokers or partitions.

### **metric.reporters**

**Type:** list

**Default:** ""

**Importance:** low

A list of classes to use as metrics reporters. Implementing the **org.apache.kafka.common.metrics.MetricsReporter** interface allows plugging in classes that will be notified of new metric creation. The JmxReporter is always included to register JMX statistics.

### **metrics.num.samples**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** low

The number of samples maintained to compute metrics.

### **metrics.recording.level**

**Type:** string

**Default:** INFO

**Valid Values:** [INFO, DEBUG, TRACE]

**Importance:** low

The highest recording level for metrics.

### **metrics.sample.window.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The window of time a metrics sample is computed over.

**reconnect.backoff.max.ms****Type:** long**Default:** 1000 (1 second)**Valid Values:** [0,...]**Importance:** low

The maximum amount of time in milliseconds to wait when reconnecting to a broker that has repeatedly failed to connect. If provided, the backoff per host will increase exponentially for each consecutive connection failure, up to this maximum. After calculating the backoff increase, 20% random jitter is added to avoid connection storms.

**reconnect.backoff.ms****Type:** long**Default:** 50**Valid Values:** [0,...]**Importance:** low

The base amount of time to wait before attempting to reconnect to a given host. This avoids repeatedly connecting to a host in a tight loop. This backoff applies to all connection attempts by the client to a broker.

**retries****Type:** int**Default:** 2147483647**Valid Values:** [0,...,2147483647]**Importance:** low

Setting a value greater than zero will cause the client to resend any request that fails with a potentially transient error. It is recommended to set the value to either zero or **MAX\_VALUE** and use corresponding timeout parameters to control how long a client should retry a request.

**retry.backoff.ms****Type:** long**Default:** 100**Valid Values:** [0,...]**Importance:** low

The amount of time to wait before attempting to retry a failed request. This avoids repeatedly sending requests in a tight loop under some failure scenarios.

**sasl.kerberos.kinit.cmd****Type:** string**Default:** /usr/bin/kinit**Importance:** low

Kerberos kinit command path.

**sasl.kerberos.min.time.before.relogin****Type:** long**Default:** 60000**Importance:** low

Login thread sleep time between refresh attempts.

**sasl.kerberos.ticket.renew.jitter**

**Type:** double

**Default:** 0.05

**Importance:** low

Percentage of random jitter added to the renewal time.

#### **sasl.kerberos.ticket.renew.window.factor**

**Type:** double

**Default:** 0.8

**Importance:** low

Login thread will sleep until the specified window factor of time from last refresh to ticket's expiry has been reached, at which time it will try to renew the ticket.

#### **sasl.login.connect.timeout.ms**

**Type:** int

**Default:** null

**Importance:** low

The (optional) value in milliseconds for the external authentication provider connection timeout. Currently applies only to OAUTHBEARER.

#### **sasl.login.read.timeout.ms**

**Type:** int

**Default:** null

**Importance:** low

The (optional) value in milliseconds for the external authentication provider read timeout. Currently applies only to OAUTHBEARER.

#### **sasl.login.refresh.buffer.seconds**

**Type:** short

**Default:** 300

**Valid Values:** [0,...,3600]

**Importance:** low

The amount of buffer time before credential expiration to maintain when refreshing a credential, in seconds. If a refresh would otherwise occur closer to expiration than the number of buffer seconds then the refresh will be moved up to maintain as much of the buffer time as possible. Legal values are between 0 and 3600 (1 hour); a default value of 300 (5 minutes) is used if no value is specified. This value and `sasl.login.refresh.min.period.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

#### **sasl.login.refresh.min.period.seconds**

**Type:** short

**Default:** 60

**Valid Values:** [0,...,900]

**Importance:** low

The desired minimum time for the login refresh thread to wait before refreshing a credential, in seconds. Legal values are between 0 and 900 (15 minutes); a default value of 60 (1 minute) is used if no value is specified. This value and `sasl.login.refresh.buffer.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

#### **sasl.login.refresh.window.factor**

**Type:** double

**Default:** 0.8

**Valid Values:** [0.5,...,1.0]

**Importance:** low

Login refresh thread will sleep until the specified window factor relative to the credential's lifetime has been reached, at which time it will try to refresh the credential. Legal values are between 0.5 (50%) and 1.0 (100%) inclusive; a default value of 0.8 (80%) is used if no value is specified. Currently applies only to OAUTHBEARER.

**sasl.login.refresh.window.jitter****Type:** double**Default:** 0.05**Valid Values:** [0.0,...,0.25]**Importance:** low

The maximum amount of random jitter relative to the credential's lifetime that is added to the login refresh thread's sleep time. Legal values are between 0 and 0.25 (25%) inclusive; a default value of 0.05 (5%) is used if no value is specified. Currently applies only to OAUTHBEARER.

**sasl.login.retry.backoff.max.ms****Type:** long**Default:** 10000 (10 seconds)**Importance:** low

The (optional) value in milliseconds for the maximum wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the sasl.login.retry.backoff.ms setting and will double in wait length between attempts up to a maximum wait length specified by the sasl.login.retry.backoff.max.ms setting. Currently applies only to OAUTHBEARER.

**sasl.login.retry.backoff.ms****Type:** long**Default:** 100**Importance:** low

The (optional) value in milliseconds for the initial wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the sasl.login.retry.backoff.ms setting and will double in wait length between attempts up to a maximum wait length specified by the sasl.login.retry.backoff.max.ms setting. Currently applies only to OAUTHBEARER.

**sasl.oauthbearer.clock.skew.seconds****Type:** int**Default:** 30**Importance:** low

The (optional) value in seconds to allow for differences between the time of the OAuth/OIDC identity provider and the broker.

**sasl.oauthbearer.expected.audience****Type:** list**Default:** null**Importance:** low

The (optional) comma-delimited setting for the broker to use to verify that the JWT was issued for one of the expected audiences. The JWT will be inspected for the standard OAuth "aud" claim and if this value is set, the broker will match the value from JWT's "aud" claim to see if there is an exact match. If there is no match, the broker will reject the JWT and authentication will fail.

**sasl.oauthbearer.expected.issuer**

**Type:** string

**Default:** null

**Importance:** low

The (optional) setting for the broker to use to verify that the JWT was created by the expected issuer. The JWT will be inspected for the standard OAuth "iss" claim and if this value is set, the broker will match it exactly against what is in the JWT's "iss" claim. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.jwks.endpoint.refresh.ms**

**Type:** long

**Default:** 3600000 (1 hour)

**Importance:** low

The (optional) value in milliseconds for the broker to wait between refreshing its JWKS (JSON Web Key Set) cache that contains the keys to verify the signature of the JWT.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

The (optional) value in milliseconds for the maximum wait between attempts to retrieve the JWKS (JSON Web Key Set) from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.ms**

**Type:** long

**Default:** 100

**Importance:** low

The (optional) value in milliseconds for the initial wait between JWKS (JSON Web Key Set) retrieval attempts from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.scope.claim.name**

**Type:** string

**Default:** scope

**Importance:** low

The OAuth claim for the scope is often named "scope", but this (optional) setting can provide a different name to use for the scope included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **sasl.oauthbearer.sub.claim.name**

**Type:** string

**Default:** sub

**Importance:** low

The OAuth claim for the subject is often named "sub", but this (optional) setting can provide a different name to use for the subject included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

## **security.providers**



**Type:** string

**Default:** null

**Importance:** low

A list of configurable creator classes each returning a provider implementing security algorithms. These classes should implement the **org.apache.kafka.common.security.auth.SecurityProviderCreator** interface.

### **ssl.cipher.suites**

**Type:** list

**Default:** null

**Importance:** low

A list of cipher suites. This is a named combination of authentication, encryption, MAC and key exchange algorithm used to negotiate the security settings for a network connection using TLS or SSL network protocol. By default all the available cipher suites are supported.

### **ssl.endpoint.identification.algorithm**

**Type:** string

**Default:** https

**Importance:** low

The endpoint identification algorithm to validate server hostname using server certificate.

### **ssl.engine.factory.class**

**Type:** class

**Default:** null

**Importance:** low

The class of type `org.apache.kafka.common.security.auth.SslEngineFactory` to provide `SSL`Engine objects. Default value is `org.apache.kafka.common.security.ssl.DefaultSslEngineFactory`.

### **ssl.keymanager.algorithm**

**Type:** string

**Default:** SunX509

**Importance:** low

The algorithm used by key manager factory for `SSL` connections. Default value is the key manager factory algorithm configured for the Java Virtual Machine.

### **ssl.secure.random.implementation**

**Type:** string

**Default:** null

**Importance:** low

The `SecureRandom` PRNG implementation to use for `SSL` cryptography operations.

### **ssl.trustmanager.algorithm**

**Type:** string

**Default:** PKIX

**Importance:** low

The algorithm used by trust manager factory for `SSL` connections. Default value is the trust manager factory algorithm configured for the Java Virtual Machine.

## CHAPTER 6. KAFKA CONNECT CONFIGURATION PROPERTIES

### **config.storage.topic**

**Type:** string

**Importance:** high

The name of the Kafka topic where connector configurations are stored.

### **group.id**

**Type:** string

**Importance:** high

A unique string that identifies the Connect cluster group this worker belongs to.

### **key.converter**

**Type:** class

**Importance:** high

Converter class used to convert between Kafka Connect format and the serialized form that is written to Kafka. This controls the format of the keys in messages written to or read from Kafka, and since this is independent of connectors it allows any connector to work with any serialization format. Examples of common formats include JSON and Avro.

### **offset.storage.topic**

**Type:** string

**Importance:** high

The name of the Kafka topic where source connector offsets are stored.

### **status.storage.topic**

**Type:** string

**Importance:** high

The name of the Kafka topic where connector and task status are stored.

### **value.converter**

**Type:** class

**Importance:** high

Converter class used to convert between Kafka Connect format and the serialized form that is written to Kafka. This controls the format of the values in messages written to or read from Kafka, and since this is independent of connectors it allows any connector to work with any serialization format. Examples of common formats include JSON and Avro.

### **bootstrap.servers**

**Type:** list

**Default:** localhost:9092

**Importance:** high

A list of host/port pairs to use for establishing the initial connection to the Kafka cluster. The client will make use of all servers irrespective of which servers are specified here for bootstrapping—this list only impacts the initial hosts used to discover the full set of servers. This list should be in the form **host1:port1,host2:port2,...** Since these servers are just used for the initial connection to discover the full cluster membership (which may change dynamically), this list need not contain the full set of servers (you may want more than one, though, in case a server is down).

**exactly.once.source.support****Type:** string**Default:** disabled**Valid Values:** (case insensitive) [DISABLED, ENABLED, PREPARING]**Importance:** high

Whether to enable exactly-once support for source connectors in the cluster by using transactions to write source records and their source offsets, and by proactively fencing out old task generations before bringing up new ones. To enable exactly-once source support on a new cluster, set this property to 'enabled'. To enable support on an existing cluster, first set to 'preparing' on every worker in the cluster, then set to 'enabled'. A rolling upgrade may be used for both changes. For more information on this feature, see the [exactly-once source support documentation](#).

**heartbeat.interval.ms****Type:** int**Default:** 3000 (3 seconds)**Importance:** high

The expected time between heartbeats to the group coordinator when using Kafka's group management facilities. Heartbeats are used to ensure that the worker's session stays active and to facilitate rebalancing when new members join or leave the group. The value must be set lower than **session.timeout.ms**, but typically should be set no higher than 1/3 of that value. It can be adjusted even lower to control the expected time for normal rebalances.

**rebalance.timeout.ms****Type:** int**Default:** 60000 (1 minute)**Importance:** high

The maximum allowed time for each worker to join the group once a rebalance has begun. This is basically a limit on the amount of time needed for all tasks to flush any pending data and commit offsets. If the timeout is exceeded, then the worker will be removed from the group, which will cause offset commit failures.

**session.timeout.ms****Type:** int**Default:** 10000 (10 seconds)**Importance:** high

The timeout used to detect worker failures. The worker sends periodic heartbeats to indicate its liveness to the broker. If no heartbeats are received by the broker before the expiration of this session timeout, then the broker will remove the worker from the group and initiate a rebalance. Note that the value must be in the allowable range as configured in the broker configuration by **group.min.session.timeout.ms** and **group.max.session.timeout.ms**.

**ssl.key.password****Type:** password**Default:** null**Importance:** high

The password of the private key in the key store file or the PEM key specified in 'ssl.keystore.key'.

**ssl.keystore.certificate.chain****Type:** password**Default:** null**Importance:** high

Certificate chain in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with a list of X.509 certificates.

### **ssl.keystore.key**

**Type:** password

**Default:** null

**Importance:** high

Private key in the format specified by 'ssl.keystore.type'. Default SSL engine factory supports only PEM format with PKCS#8 keys. If the key is encrypted, key password must be specified using 'ssl.key.password'.

### **ssl.keystore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the key store file. This is optional for client and can be used for two-way authentication for client.

### **ssl.keystore.password**

**Type:** password

**Default:** null

**Importance:** high

The store password for the key store file. This is optional for client and only needed if 'ssl.keystore.location' is configured. Key store password is not supported for PEM format.

### **ssl.truststore.certificates**

**Type:** password

**Default:** null

**Importance:** high

Trusted certificates in the format specified by 'ssl.truststore.type'. Default SSL engine factory supports only PEM format with X.509 certificates.

### **ssl.truststore.location**

**Type:** string

**Default:** null

**Importance:** high

The location of the trust store file.

### **ssl.truststore.password**

**Type:** password

**Default:** null

**Importance:** high

The password for the trust store file. If a password is not set, trust store file configured will still be used, but integrity checking is disabled. Trust store password is not supported for PEM format.

### **client.dns.lookup**

**Type:** string

**Default:** use\_all\_dns\_ips

**Valid Values:** [use\_all\_dns\_ips, resolve\_canonical\_bootstrap\_servers\_only]

**Importance:** medium

Controls how the client uses DNS lookups. If set to **use\_all\_dns\_ips**, connect to each returned IP

address in sequence until a successful connection is established. After a disconnection, the next IP is used. Once all IPs have been used once, the client resolves the IP(s) from the hostname again (both the JVM and the OS cache DNS name lookups, however). If set to **resolve\_canonical\_bootstrap\_servers\_only**, resolve each bootstrap address into a list of canonical names. After the bootstrap phase, this behaves the same as **use\_all\_dns\_ips**.

### connections.max.idle.ms

**Type:** long

**Default:** 540000 (9 minutes)

**Importance:** medium

Close idle connections after the number of milliseconds specified by this config.

### connector.client.config.override.policy

**Type:** string

**Default:** All

**Importance:** medium

Class name or alias of implementation of **ConnectorClientConfigOverridePolicy**. Defines what client configurations can be overridden by the connector. The default implementation is **All**, meaning connector configurations can override all client properties. The other possible policies in the framework include **None** to disallow connectors from overriding client properties, and **Principal** to allow connectors to override only client principals.

### receive.buffer.bytes

**Type:** int

**Default:** 32768 (32 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP receive buffer (SO\_RCVBUF) to use when reading data. If the value is -1, the OS default will be used.

### request.timeout.ms

**Type:** int

**Default:** 40000 (40 seconds)

**Valid Values:** [0,...]

**Importance:** medium

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted.

### sasl.client.callback.handler.class

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL client callback handler class that implements the `AuthenticateCallbackHandler` interface.

### sasl.jaas.config

**Type:** password

**Default:** null

**Importance:** medium

JAAS login context parameters for SASL connections in the format used by JAAS configuration files. JAAS configuration file format is described [here](#). The format for the value is: **loginModuleClass**

**controlFlag (optionName=optionValue)\***; For brokers, the config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.jaas.config=com.example.ScramLoginModule required;

### **sasl.kerberos.service.name**

**Type:** string

**Default:** null

**Importance:** medium

The Kerberos principal name that Kafka runs as. This can be defined either in Kafka's JAAS config or in Kafka's config.

### **sasl.login.callback.handler.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a SASL login callback handler class that implements the AuthenticateCallbackHandler interface. For brokers, login callback handler config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.login.callback.handler.class=com.example.CustomScramLoginCallbackHandler.

### **sasl.login.class**

**Type:** class

**Default:** null

**Importance:** medium

The fully qualified name of a class that implements the Login interface. For brokers, login config must be prefixed with listener prefix and SASL mechanism name in lower-case. For example, listener.name.sasl\_ssl.scram-sha-256.sasl.login.class=com.example.CustomScramLogin.

### **sasl.mechanism**

**Type:** string

**Default:** GSSAPI

**Importance:** medium

SASL mechanism used for client connections. This may be any mechanism for which a security provider is available. GSSAPI is the default mechanism.

### **sasl.oauthbearer.jwks.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The OAuth/OIDC provider URL from which the provider's [JWKS \(JSON Web Key Set\)](#) can be retrieved. The URL can be HTTP(S)-based or file-based. If the URL is HTTP(S)-based, the JWKS data will be retrieved from the OAuth/OIDC provider via the configured URL on broker startup. All then-current keys will be cached on the broker for incoming requests. If an authentication request is received for a JWT that includes a "kid" header claim value that isn't yet in the cache, the JWKS endpoint will be queried again on demand. However, the broker polls the URL every sasl.oauthbearer.jwks.endpoint.refresh.ms milliseconds to refresh the cache with any forthcoming keys before any JWT requests that include them are received. If the URL is file-based, the broker will load the JWKS file from a configured location on startup. In the event that the JWT includes a "kid" header value that isn't in the JWKS file, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.token.endpoint.url**

**Type:** string

**Default:** null

**Importance:** medium

The URL for the OAuth/OIDC identity provider. If the URL is HTTP(S)-based, it is the issuer's token endpoint URL to which requests will be made to login based on the configuration in `sasl.jaas.config`. If the URL is file-based, it specifies a file containing an access token (in JWT serialized form) issued by the OAuth/OIDC identity provider to use for authorization.

### **security.protocol**

**Type:** string

**Default:** PLAINTEXT

**Valid Values:** (case insensitive) [SASL\_SSL, PLAINTEXT, SSL, SASL\_PLAINTEXT]

**Importance:** medium

Protocol used to communicate with brokers. Valid values are: PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL.

### **send.buffer.bytes**

**Type:** int

**Default:** 131072 (128 kibibytes)

**Valid Values:** [-1,...]

**Importance:** medium

The size of the TCP send buffer (SO\_SNDBUF) to use when sending data. If the value is -1, the OS default will be used.

### **ssl.enabled.protocols**

**Type:** list

**Default:** TLSv1.2,TLSv1.3

**Importance:** medium

The list of protocols enabled for SSL connections. The default is 'TLSv1.2,TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. With the default value for Java 11, clients and servers will prefer TLSv1.3 if both support it and fallback to TLSv1.2 otherwise (assuming both support at least TLSv1.2). This default should be fine for most cases. Also see the config documentation for **ssl.protocol**.

### **ssl.keystore.type**

**Type:** string

**Default:** JKS

**Importance:** medium

The file format of the key store file. This is optional for client. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

### **ssl.protocol**

**Type:** string

**Default:** TLSv1.3

**Importance:** medium

The SSL protocol used to generate the SSLContext. The default is 'TLSv1.3' when running with Java 11 or newer, 'TLSv1.2' otherwise. This value should be fine for most use cases. Allowed values in recent JVMs are 'TLSv1.2' and 'TLSv1.3'. 'TLS', 'TLSv1.1', 'SSL', 'SSLv2' and 'SSLv3' may be supported in older JVMs, but their usage is discouraged due to known security vulnerabilities. With the default value for this config and 'ssl.enabled.protocols', clients will downgrade to 'TLSv1.2' if the server does not support 'TLSv1.3'. If this config is set to 'TLSv1.2', clients will not use 'TLSv1.3' even if it is one of the values in `ssl.enabled.protocols` and the server only supports 'TLSv1.3'.

**ssl.provider****Type:** string**Default:** null**Importance:** medium

The name of the security provider used for SSL connections. Default value is the default security provider of the JVM.

**ssl.truststore.type****Type:** string**Default:** JKS**Importance:** medium

The file format of the trust store file. The values currently supported by the default **ssl.engine.factory.class** are [JKS, PKCS12, PEM].

**worker.sync.timeout.ms****Type:** int**Default:** 3000 (3 seconds)**Importance:** medium

When the worker is out of sync with other workers and needs to resynchronize configurations, wait up to this amount of time before giving up, leaving the group, and waiting a backoff period before rejoining.

**worker.unsync.backoff.ms****Type:** int**Default:** 300000 (5 minutes)**Importance:** medium

When the worker is out of sync with other workers and fails to catch up within `worker.sync.timeout.ms`, leave the Connect cluster for this long before rejoining.

**access.control.allow.methods****Type:** string**Default:** ""**Importance:** low

Sets the methods supported for cross origin requests by setting the Access-Control-Allow-Methods header. The default value of the Access-Control-Allow-Methods header allows cross origin requests for GET, POST and HEAD.

**access.control.allow.origin****Type:** string**Default:** ""**Importance:** low

Value to set the Access-Control-Allow-Origin header to for REST API requests. To enable cross origin access, set this to the domain of the application that should be permitted to access the API, or '\*' to allow access from any domain. The default value only allows access from the domain of the REST API.

**admin.listeners****Type:** list**Default:** null**Valid Values:** List of comma-separated URLs, ex: <http://localhost:8080>,<https://localhost:8443>.**Importance:** low



List of comma-separated URIs the Admin REST API will listen on. The supported protocols are HTTP and HTTPS. An empty or blank string will disable this feature. The default behavior is to use the regular listener (specified by the 'listeners' property).

### **auto.include.jmx.reporter**

**Type:** boolean

**Default:** true

**Importance:** low

Deprecated. Whether to automatically include JmxReporter even if it's not listed in **metric.reporters**. This configuration will be removed in Kafka 4.0, users should instead include **org.apache.kafka.common.metrics.JmxReporter** in **metric.reporters** in order to enable the JmxReporter.

### **client.id**

**Type:** string

**Default:** ""

**Importance:** low

An id string to pass to the server when making requests. The purpose of this is to be able to track the source of requests beyond just ip/port by allowing a logical application name to be included in server-side request logging.

### **config.providers**

**Type:** list

**Default:** ""

**Importance:** low

Comma-separated names of **ConfigProvider** classes, loaded and used in the order specified. Implementing the interface **ConfigProvider** allows you to replace variable references in connector configurations, such as for externalized secrets.

### **config.storage.replication.factor**

**Type:** short

**Default:** 3

**Valid Values:** Positive number not larger than the number of brokers in the Kafka cluster, or -1 to use the broker's default

**Importance:** low

Replication factor used when creating the configuration storage topic.

### **connect.protocol**

**Type:** string

**Default:** sessioned

**Valid Values:** [eager, compatible, sessioned]

**Importance:** low

Compatibility mode for Kafka Connect Protocol.

### **header.converter**

**Type:** class

**Default:** org.apache.kafka.connect.storage.SimpleHeaderConverter

**Importance:** low

HeaderConverter class used to convert between Kafka Connect format and the serialized form that is written to Kafka. This controls the format of the header values in messages written to or read from Kafka, and since this is independent of connectors it allows any connector to work with any

serialization format. Examples of common formats include JSON and Avro. By default, the SimpleHeaderConverter is used to serialize header values to strings and deserialize them by inferring the schemas.

### **inter.worker.key.generation.algorithm**

**Type:** string

**Default:** HmacSHA256

**Valid Values:** Any KeyGenerator algorithm supported by the worker JVM

**Importance:** low

The algorithm to use for generating internal request keys. The algorithm 'HmacSHA256' will be used as a default on JVMs that support it; on other JVMs, no default is used and a value for this property must be manually specified in the worker config.

### **inter.worker.key.size**

**Type:** int

**Default:** null

**Importance:** low

The size of the key to use for signing internal requests, in bits. If null, the default key size for the key generation algorithm will be used.

### **inter.worker.key.ttl.ms**

**Type:** int

**Default:** 3600000 (1 hour)

**Valid Values:** [0,...,2147483647]

**Importance:** low

The TTL of generated session keys used for internal request validation (in milliseconds).

### **inter.worker.signature.algorithm**

**Type:** string

**Default:** HmacSHA256

**Valid Values:** Any MAC algorithm supported by the worker JVM

**Importance:** low

The algorithm used to sign internal requests. The algorithm 'inter.worker.signature.algorithm' will be used as a default on JVMs that support it; on other JVMs, no default is used and a value for this property must be manually specified in the worker config.

### **inter.worker.verification.algorithms**

**Type:** list

**Default:** HmacSHA256

**Valid Values:** A list of one or more MAC algorithms, each supported by the worker JVM

**Importance:** low

A list of permitted algorithms for verifying internal requests, which must include the algorithm used for the inter.worker.signature.algorithm property. The algorithm(s) '[HmacSHA256]' will be used as a default on JVMs that provide them; on other JVMs, no default is used and a value for this property must be manually specified in the worker config.

### **listeners**

**Type:** list

**Default:** <http://:8083>

**Valid Values:** List of comma-separated URLs, ex: <http://localhost:8080>,<https://localhost:8443>.

**Importance:** low

List of comma-separated URIs the REST API will listen on. The supported protocols are HTTP and HTTPS. Specify hostname as 0.0.0.0 to bind to all interfaces. Leave hostname empty to bind to default interface. Examples of legal listener lists: HTTP://myhost:8083,HTTPS://myhost:8084.

### **metadata.max.age.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...]

**Importance:** low

The period of time in milliseconds after which we force a refresh of metadata even if we haven't seen any partition leadership changes to proactively discover any new brokers or partitions.

### **metric.reporters**

**Type:** list

**Default:** ""

**Importance:** low

A list of classes to use as metrics reporters. Implementing the **org.apache.kafka.common.metrics.MetricsReporter** interface allows plugging in classes that will be notified of new metric creation. The JmxReporter is always included to register JMX statistics.

### **metrics.num.samples**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** low

The number of samples maintained to compute metrics.

### **metrics.recording.level**

**Type:** string

**Default:** INFO

**Valid Values:** [INFO, DEBUG]

**Importance:** low

The highest recording level for metrics.

### **metrics.sample.window.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The window of time a metrics sample is computed over.

### **offset.flush.interval.ms**

**Type:** long

**Default:** 60000 (1 minute)

**Importance:** low

Interval at which to try committing offsets for tasks.

### **offset.flush.timeout.ms**

**Type:** long

**Default:** 5000 (5 seconds)

**Importance:** low

Maximum number of milliseconds to wait for records to flush and partition offset data to be committed to offset storage before cancelling the process and restoring the offset data to be committed in a future attempt. This property has no effect for source connectors running with exactly-once support.

### **offset.storage.partitions**

**Type:** int

**Default:** 25

**Valid Values:** Positive number, or -1 to use the broker's default

**Importance:** low

The number of partitions used when creating the offset storage topic.

### **offset.storage.replication.factor**

**Type:** short

**Default:** 3

**Valid Values:** Positive number not larger than the number of brokers in the Kafka cluster, or -1 to use the broker's default

**Importance:** low

Replication factor used when creating the offset storage topic.

### **plugin.discovery**

**Type:** string

**Default:** hybrid\_warn

**Valid Values:** (case insensitive) [ONLY\_SCAN, SERVICE\_LOAD, HYBRID\_WARN, HYBRID\_FAIL]

**Importance:** low

Method to use to discover plugins present in the classpath and plugin.path configuration. This can be one of multiple values with the following meanings: \* only\_scan: Discover plugins only by reflection. Plugins which are not discoverable by ServiceLoader will not impact worker startup. \* hybrid\_warn: Discover plugins reflectively and by ServiceLoader. Plugins which are not discoverable by ServiceLoader will print warnings during worker startup. \* hybrid\_fail: Discover plugins reflectively and by ServiceLoader. Plugins which are not discoverable by ServiceLoader will cause worker startup to fail. \* service\_load: Discover plugins only by ServiceLoader. Faster startup than other modes. Plugins which are not discoverable by ServiceLoader may not be usable.

### **plugin.path**

**Type:** list

**Default:** null

**Importance:** low

List of paths separated by commas (,) that contain plugins (connectors, converters, transformations). The list should consist of top level directories that include any combination of: a) directories immediately containing jars with plugins and their dependencies b) uber-jars with plugins and their dependencies c) directories immediately containing the package directory structure of classes of plugins and their dependencies Note: symlinks will be followed to discover dependencies or plugins. Examples:

plugin.path=/usr/local/share/java,/usr/local/share/kafka/plugins,/opt/connectors Do not use config provider variables in this property, since the raw path is used by the worker's scanner before config providers are initialized and used to replace variables.

### **reconnect.backoff.max.ms**

**Type:** long

**Default:** 1000 (1 second)

**Valid Values:** [0,...]

**Importance:** low

The maximum amount of time in milliseconds to wait when reconnecting to a broker that has repeatedly failed to connect. If provided, the backoff per host will increase exponentially for each consecutive connection failure, up to this maximum. After calculating the backoff increase, 20% random jitter is added to avoid connection storms.

#### **reconnect.backoff.ms**

**Type:** long

**Default:** 50

**Valid Values:** [0,...]

**Importance:** low

The base amount of time to wait before attempting to reconnect to a given host. This avoids repeatedly connecting to a host in a tight loop. This backoff applies to all connection attempts by the client to a broker.

#### **response.http.headers.config**

**Type:** string

**Default:** ""

**Valid Values:** Comma-separated header rules, where each header rule is of the form '[action] [header name]:[header value]' and optionally surrounded by double quotes if any part of a header rule contains a comma

**Importance:** low

Rules for REST API HTTP response headers.

#### **rest.advertised.host.name**

**Type:** string

**Default:** null

**Importance:** low

If this is set, this is the hostname that will be given out to other workers to connect to.

#### **rest.advertised.listener**

**Type:** string

**Default:** null

**Importance:** low

Sets the advertised listener (HTTP or HTTPS) which will be given to other workers to use.

#### **rest.advertised.port**

**Type:** int

**Default:** null

**Importance:** low

If this is set, this is the port that will be given out to other workers to connect to.

#### **rest.extension.classes**

**Type:** list

**Default:** ""

**Importance:** low

Comma-separated names of **ConnectRestExtension** classes, loaded and called in the order specified. Implementing the interface **ConnectRestExtension** allows you to inject into Connect's REST API user defined resources like filters. Typically used to add custom capability like logging, security, etc.

#### **retry.backoff.ms**

**Type:** long  
**Default:** 100  
**Valid Values:** [0,...]  
**Importance:** low

The amount of time to wait before attempting to retry a failed request to a given topic partition. This avoids repeatedly sending requests in a tight loop under some failure scenarios.

#### **sasl.kerberos.kinit.cmd**

**Type:** string  
**Default:** /usr/bin/kinit  
**Importance:** low

Kerberos kinit command path.

#### **sasl.kerberos.min.time.before.relogin**

**Type:** long  
**Default:** 60000  
**Importance:** low

Login thread sleep time between refresh attempts.

#### **sasl.kerberos.ticket.renew.jitter**

**Type:** double  
**Default:** 0.05  
**Importance:** low

Percentage of random jitter added to the renewal time.

#### **sasl.kerberos.ticket.renew.window.factor**

**Type:** double  
**Default:** 0.8  
**Importance:** low

Login thread will sleep until the specified window factor of time from last refresh to ticket's expiry has been reached, at which time it will try to renew the ticket.

#### **sasl.login.connect.timeout.ms**

**Type:** int  
**Default:** null  
**Importance:** low

The (optional) value in milliseconds for the external authentication provider connection timeout. Currently applies only to OAUTHBEARER.

#### **sasl.login.read.timeout.ms**

**Type:** int  
**Default:** null  
**Importance:** low

The (optional) value in milliseconds for the external authentication provider read timeout. Currently applies only to OAUTHBEARER.

#### **sasl.login.refresh.buffer.seconds**

**Type:** short  
**Default:** 300  
**Valid Values:** [0,...,3600]  
**Importance:** low

The amount of buffer time before credential expiration to maintain when refreshing a credential, in seconds. If a refresh would otherwise occur closer to expiration than the number of buffer seconds then the refresh will be moved up to maintain as much of the buffer time as possible. Legal values are between 0 and 3600 (1 hour); a default value of 300 (5 minutes) is used if no value is specified. This value and `sasl.login.refresh.min.period.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

### **`sasl.login.refresh.min.period.seconds`**

**Type:** short

**Default:** 60

**Valid Values:** [0,...,900]

**Importance:** low

The desired minimum time for the login refresh thread to wait before refreshing a credential, in seconds. Legal values are between 0 and 900 (15 minutes); a default value of 60 (1 minute) is used if no value is specified. This value and `sasl.login.refresh.buffer.seconds` are both ignored if their sum exceeds the remaining lifetime of a credential. Currently applies only to OAUTHBEARER.

### **`sasl.login.refresh.window.factor`**

**Type:** double

**Default:** 0.8

**Valid Values:** [0.5,...,1.0]

**Importance:** low

Login refresh thread will sleep until the specified window factor relative to the credential's lifetime has been reached, at which time it will try to refresh the credential. Legal values are between 0.5 (50%) and 1.0 (100%) inclusive; a default value of 0.8 (80%) is used if no value is specified. Currently applies only to OAUTHBEARER.

### **`sasl.login.refresh.window.jitter`**

**Type:** double

**Default:** 0.05

**Valid Values:** [0.0,...,0.25]

**Importance:** low

The maximum amount of random jitter relative to the credential's lifetime that is added to the login refresh thread's sleep time. Legal values are between 0 and 0.25 (25%) inclusive; a default value of 0.05 (5%) is used if no value is specified. Currently applies only to OAUTHBEARER.

### **`sasl.login.retry.backoff.max.ms`**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

The (optional) value in milliseconds for the maximum wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

### **`sasl.login.retry.backoff.ms`**

**Type:** long

**Default:** 100

**Importance:** low

The (optional) value in milliseconds for the initial wait between login attempts to the external authentication provider. Login uses an exponential backoff algorithm with an initial wait based on the `sasl.login.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum

wait length specified by the `sasl.login.retry.backoff.max.ms` setting. Currently applies only to OAUTHBEARER.

### **sasl.oauthbearer.clock.skew.seconds**

**Type:** int

**Default:** 30

**Importance:** low

The (optional) value in seconds to allow for differences between the time of the OAuth/OIDC identity provider and the broker.

### **sasl.oauthbearer.expected.audience**

**Type:** list

**Default:** null

**Importance:** low

The (optional) comma-delimited setting for the broker to use to verify that the JWT was issued for one of the expected audiences. The JWT will be inspected for the standard OAuth "aud" claim and if this value is set, the broker will match the value from JWT's "aud" claim to see if there is an exact match. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.expected.issuer**

**Type:** string

**Default:** null

**Importance:** low

The (optional) setting for the broker to use to verify that the JWT was created by the expected issuer. The JWT will be inspected for the standard OAuth "iss" claim and if this value is set, the broker will match it exactly against what is in the JWT's "iss" claim. If there is no match, the broker will reject the JWT and authentication will fail.

### **sasl.oauthbearer.jwks.endpoint.refresh.ms**

**Type:** long

**Default:** 3600000 (1 hour)

**Importance:** low

The (optional) value in milliseconds for the broker to wait between refreshing its JWKS (JSON Web Key Set) cache that contains the keys to verify the signature of the JWT.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Importance:** low

The (optional) value in milliseconds for the maximum wait between attempts to retrieve the JWKS (JSON Web Key Set) from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.jwks.endpoint.retry.backoff.ms**

**Type:** long

**Default:** 100

**Importance:** low

The (optional) value in milliseconds for the initial wait between JWKS (JSON Web Key Set) retrieval attempts from the external authentication provider. JWKS retrieval uses an exponential backoff algorithm with an initial wait based on the `sasl.oauthbearer.jwks.endpoint.retry.backoff.ms` setting



and will double in wait length between attempts up to a maximum wait length specified by the `sasl.oauthbearer.jwks.endpoint.retry.backoff.max.ms` setting.

### **sasl.oauthbearer.scope.claim.name**

**Type:** string

**Default:** scope

**Importance:** low

The OAuth claim for the scope is often named "scope", but this (optional) setting can provide a different name to use for the scope included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **sasl.oauthbearer.sub.claim.name**

**Type:** string

**Default:** sub

**Importance:** low

The OAuth claim for the subject is often named "sub", but this (optional) setting can provide a different name to use for the subject included in the JWT payload's claims if the OAuth/OIDC provider uses a different name for that claim.

### **scheduled.rebalance.max.delay.ms**

**Type:** int

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...,2147483647]

**Importance:** low

The maximum delay that is scheduled in order to wait for the return of one or more departed workers before rebalancing and reassigning their connectors and tasks to the group. During this period the connectors and tasks of the departed workers remain unassigned.

### **socket.connection.setup.timeout.max.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The maximum amount of time the client will wait for the socket connection to be established. The connection setup timeout will increase exponentially for each consecutive connection failure up to this maximum. To avoid connection storms, a randomization factor of 0.2 will be applied to the timeout resulting in a random range between 20% below and 20% above the computed value.

### **socket.connection.setup.timeout.ms**

**Type:** long

**Default:** 10000 (10 seconds)

**Valid Values:** [0,...]

**Importance:** low

The amount of time the client will wait for the socket connection to be established. If the connection is not built before the timeout elapses, clients will close the socket channel.

### **ssl.cipher.suites**

**Type:** list

**Default:** null

**Importance:** low

A list of cipher suites. This is a named combination of authentication, encryption, MAC and key exchange algorithm used to negotiate the security settings for a network connection using TLS or SSL network protocol. By default all the available cipher suites are supported.

### **ssl.client.auth**

**Type:** string

**Default:** none

**Valid Values:** [required, requested, none]

**Importance:** low

Configures kafka broker to request client authentication. The following settings are common:

- **ssl.client.auth=required** If set to required client authentication is required.
- **ssl.client.auth=requested** This means client authentication is optional. unlike required, if this option is set client can choose not to provide authentication information about itself
- **ssl.client.auth=none** This means client authentication is not needed.

### **ssl.endpoint.identification.algorithm**

**Type:** string

**Default:** https

**Importance:** low

The endpoint identification algorithm to validate server hostname using server certificate.

### **ssl.engine.factory.class**

**Type:** class

**Default:** null

**Importance:** low

The class of type org.apache.kafka.common.security.auth.SslEngineFactory to provide SslEngine objects. Default value is org.apache.kafka.common.security.ssl.DefaultSslEngineFactory.

### **ssl.keymanager.algorithm**

**Type:** string

**Default:** SunX509

**Importance:** low

The algorithm used by key manager factory for SSL connections. Default value is the key manager factory algorithm configured for the Java Virtual Machine.

### **ssl.secure.random.implementation**

**Type:** string

**Default:** null

**Importance:** low

The SecureRandom PRNG implementation to use for SSL cryptography operations.

### **ssl.trustmanager.algorithm**

**Type:** string

**Default:** PKIX

**Importance:** low

The algorithm used by trust manager factory for SSL connections. Default value is the trust manager factory algorithm configured for the Java Virtual Machine.

### **status.storage.partitions**

**Type:** int

**Default:** 5

**Valid Values:** Positive number, or -1 to use the broker's default

**Importance:** low

The number of partitions used when creating the status storage topic.

### **status.storage.replication.factor**

**Type:** short

**Default:** 3

**Valid Values:** Positive number not larger than the number of brokers in the Kafka cluster, or -1 to use the broker's default

**Importance:** low

Replication factor used when creating the status storage topic.

### **task.shutdown.graceful.timeout.ms**

**Type:** long

**Default:** 5000 (5 seconds)

**Importance:** low

Amount of time to wait for tasks to shutdown gracefully. This is the total amount of time, not per task. All task have shutdown triggered, then they are waited on sequentially.

### **topic.creation.enable**

**Type:** boolean

**Default:** true

**Importance:** low

Whether to allow automatic creation of topics used by source connectors, when source connectors are configured with **topic.creation.** properties. Each task will use an admin client to create its topics and will not depend on the Kafka brokers to create topics automatically.

### **topic.tracking.allow.reset**

**Type:** boolean

**Default:** true

**Importance:** low

If set to true, it allows user requests to reset the set of active topics per connector.

### **topic.tracking.enable**

**Type:** boolean

**Default:** true

**Importance:** low

Enable tracking the set of active topics per connector during runtime.

## CHAPTER 7. KAFKA STREAMS CONFIGURATION PROPERTIES

### **application.id**

**Type:** string

**Importance:** high

An identifier for the stream processing application. Must be unique within the Kafka cluster. It is used as 1) the default client-id prefix, 2) the group-id for membership management, 3) the changelog topic prefix.

### **bootstrap.servers**

**Type:** list

**Importance:** high

A list of host/port pairs to use for establishing the initial connection to the Kafka cluster. The client will make use of all servers irrespective of which servers are specified here for bootstrapping—this list only impacts the initial hosts used to discover the full set of servers. This list should be in the form **host1:port1,host2:port2,...**. Since these servers are just used for the initial connection to discover the full cluster membership (which may change dynamically), this list need not contain the full set of servers (you may want more than one, though, in case a server is down).

### **num.standby.replicas**

**Type:** int

**Default:** 0

**Importance:** high

The number of standby replicas for each task.

### **state.dir**

**Type:** string

**Default:** /tmp/kafka-streams

**Importance:** high

Directory location for state store. This path must be unique for each streams instance sharing the same underlying filesystem.

### **acceptable.recovery.lag**

**Type:** long

**Default:** 10000

**Valid Values:** [0,...]

**Importance:** medium

The maximum acceptable lag (number of offsets to catch up) for a client to be considered caught-up enough to receive an active task assignment. Upon assignment, it will still restore the rest of the changelog before processing. To avoid a pause in processing during rebalances, this config should correspond to a recovery time of well under a minute for a given workload. Must be at least 0.

### **cache.max.bytes.buffering**

**Type:** long

**Default:** 10485760

**Valid Values:** [0,...]

**Importance:** medium

Maximum number of memory bytes to be used for buffering across all threads.

### **client.id**

**Type:** string

**Default:** ""

**Importance:** medium

An ID prefix string used for the client IDs of internal consumer, producer and restore-consumer, with pattern `<client.id>-StreamThread-<threadSequenceNumber>;-<consumer|producer|restore-consumer>`.

#### **default.deserialization.exception.handler**

**Type:** class

**Default:** org.apache.kafka.streams.errors.LogAndFailExceptionHandler

**Importance:** medium

Exception handling class that implements the

**org.apache.kafka.streams.errors.DeserializationExceptionHandler** interface.

#### **default.key.serde**

**Type:** class

**Default:** null

**Importance:** medium

Default serializer / deserializer class for key that implements the

**org.apache.kafka.common.serialization.Serde** interface. Note when windowed serde class is used, one needs to set the inner serde class that implements the

**org.apache.kafka.common.serialization.Serde** interface via 'default.windowed.key.serde.inner' or 'default.windowed.value.serde.inner' as well.

#### **default.list.key.serde.inner**

**Type:** class

**Default:** null

**Importance:** medium

Default inner class of list serde for key that implements the

**org.apache.kafka.common.serialization.Serde** interface. This configuration will be read if and only if **default.key.serde** configuration is set to

**org.apache.kafka.common.serialization.Serdes.ListSerde**.

#### **default.list.key.serde.type**

**Type:** class

**Default:** null

**Importance:** medium

Default class for key that implements the **java.util.List** interface. This configuration will be read if and only if **default.key.serde** configuration is set to

**org.apache.kafka.common.serialization.Serdes.ListSerde** Note when list serde class is used, one needs to set the inner serde class that implements the

**org.apache.kafka.common.serialization.Serde** interface via 'default.list.key.serde.inner'.

#### **default.list.value.serde.inner**

**Type:** class

**Default:** null

**Importance:** medium

Default inner class of list serde for value that implements the

**org.apache.kafka.common.serialization.Serde** interface. This configuration will be read if and only if **default.value.serde** configuration is set to

**org.apache.kafka.common.serialization.Serdes.ListSerde**.

**default.list.value.serde.type****Type:** class**Default:** null**Importance:** medium

Default class for value that implements the **java.util.List** interface. This configuration will be read if and only if **default.value.serde** configuration is set to

**org.apache.kafka.common.serialization.Serdes.ListSerde** Note when list serde class is used, one needs to set the inner serde class that implements the

**org.apache.kafka.common.serialization.Serde** interface via 'default.list.value.serde.inner'.

**default.production.exception.handler****Type:** class**Default:** org.apache.kafka.streams.errors.DefaultProductionExceptionHandler**Importance:** medium

Exception handling class that implements the

**org.apache.kafka.streams.errors.ProductionExceptionHandler** interface.

**default.timestamp.extractor****Type:** class**Default:** org.apache.kafka.streams.processor.FailOnInvalidTimestamp**Importance:** medium

Default timestamp extractor class that implements the

**org.apache.kafka.streams.processor.TimestampExtractor** interface.

**default.value.serde****Type:** class**Default:** null**Importance:** medium

Default serializer / deserializer class for value that implements the

**org.apache.kafka.common.serialization.Serde** interface. Note when windowed serde class is used, one needs to set the inner serde class that implements the

**org.apache.kafka.common.serialization.Serde** interface via 'default.windowed.key.serde.inner' or 'default.windowed.value.serde.inner' as well.

**max.task.idle.ms****Type:** long**Default:** 0**Importance:** medium

This config controls whether joins and merges may produce out-of-order results. The config value is the maximum amount of time in milliseconds a stream task will stay idle when it is fully caught up on some (but not all) input partitions to wait for producers to send additional records and avoid potential out-of-order record processing across multiple input streams. The default (zero) does not wait for producers to send more records, but it does wait to fetch data that is already present on the brokers. This default means that for records that are already present on the brokers, Streams will process them in timestamp order. Set to -1 to disable idling entirely and process any locally available data, even though doing so may produce out-of-order processing.

**max.warmup.replicas****Type:** int**Default:** 2**Valid Values:** [1,...]**Importance:** medium

The maximum number of warmup replicas (extra standbys beyond the configured `num.standbys`) that can be assigned at once for the purpose of keeping the task available on one instance while it is warming up on another instance it has been reassigned to. Used to throttle how much extra broker traffic and cluster state can be used for high availability. Must be at least 1. Note that one warmup replica corresponds to one Stream Task. Furthermore, note that each warmup replica can only be promoted to an active task during a rebalance (normally during a so-called probing rebalance, which occur at a frequency specified by the `probing.rebalance.interval.ms` config). This means that the maximum rate at which active tasks can be migrated from one Kafka Streams Instance to another instance can be determined by  $(\text{max.warmup.replicas} / \text{probing.rebalance.interval.ms})$ .

### `num.stream.threads`

**Type:** int

**Default:** 1

**Importance:** medium

The number of threads to execute stream processing.

### `processing.guarantee`

**Type:** string

**Default:** `at_least_once`

**Valid Values:** [`at_least_once`, `exactly_once`, `exactly_once_beta`, `exactly_once_v2`]

**Importance:** medium

The processing guarantee that should be used. Possible values are `at_least_once` (default) and `exactly_once_v2` (requires brokers version 2.5 or higher). Deprecated options are `exactly_once` (requires brokers version 0.11.0 or higher) and `exactly_once_beta` (requires brokers version 2.5 or higher). Note that exactly-once processing requires a cluster of at least three brokers by default what is the recommended setting for production; for development you can change this, by adjusting broker setting `transaction.state.log.replication.factor` and `transaction.state.log.min.isr`.

### `rack.aware.assignment.non_overlap_cost`

**Type:** int

**Default:** null

**Importance:** medium

Cost associated with moving tasks from existing assignment. This config and `rack.aware.assignment.traffic_cost` controls whether the optimization algorithm favors minimizing cross rack traffic or minimize the movement of tasks in existing assignment. If set a larger value `org.apache.kafka.streams.processor.internals.assignment.RackAwareTaskAssignor` will optimize to maintain the existing assignment. The default value is null which means it will use default `non_overlap` cost values in different assignors.

### `rack.aware.assignment.strategy`

**Type:** string

**Default:** none

**Valid Values:** [`none`, `min_traffic`]

**Importance:** medium

The strategy we use for rack aware assignment. Rack aware assignment will take `client.rack` and `racks` of `TopicPartition` into account when assigning tasks to minimize cross rack traffic. Valid settings are : `none` (default), which will disable rack aware assignment; `min_traffic`, which will compute minimum cross rack traffic assignment.

### `rack.aware.assignment.tags`

**Type:** list

**Default:** ""

**Valid Values:** List containing maximum of 5 elements

**Importance:** medium

List of client tag keys used to distribute standby replicas across Kafka Streams instances. When configured, Kafka Streams will make a best-effort to distribute the standby tasks over each client tag dimension.

### **rack.aware.assignment.traffic\_cost**

**Type:** int

**Default:** null

**Importance:** medium

Cost associated with cross rack traffic. This config and **rack.aware.assignment.non\_overlap\_cost** controls whether the optimization algorithm favors minimizing cross rack traffic or minimize the movement of tasks in existing assignment. If set a larger value

**org.apache.kafka.streams.processor.internals.assignment.RackAwareTaskAssignor** will optimize for minimizing cross rack traffic. The default value is null which means it will use default traffic cost values in different assignors.

### **replication.factor**

**Type:** int

**Default:** -1

**Importance:** medium

The replication factor for change log topics and repartition topics created by the stream processing application. The default of **-1** (meaning: use broker default replication factor) requires broker version 2.4 or newer.

### **security.protocol**

**Type:** string

**Default:** PLAINTEXT

**Valid Values:** (case insensitive) [SASL\_SSL, PLAINTEXT, SSL, SASL\_PLAINTEXT]

**Importance:** medium

Protocol used to communicate with brokers. Valid values are: PLAINTEXT, SSL, SASL\_PLAINTEXT, SASL\_SSL.

### **statestore.cache.max.bytes**

**Type:** long

**Default:** 10485760 (10 mebibytes)

**Valid Values:** [0,...]

**Importance:** medium

Maximum number of memory bytes to be used for statestore cache across all threads.

### **task.timeout.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...]

**Importance:** medium

The maximum amount of time in milliseconds a task might stall due to internal errors and retries until an error is raised. For a timeout of 0ms, a task would raise an error for the first internal error. For any timeout larger than 0ms, a task will retry at least once before an error is raised.

### **topology.optimization**

**Type:** string

**Default:** none

**Valid Values:**



org.apache.kafka.streams.StreamsConfig\$\$Lambda/0x00007fe89800a400@31cefde0

**Importance:** medium

A configuration telling Kafka Streams if it should optimize the topology and what optimizations to apply. Acceptable values are: "NO\_OPTIMIZATION", "OPTIMIZE", or a comma separated list of specific optimizations: ("REUSE\_KTABLE\_SOURCE\_TOPICS", "MERGE\_REPARTITION\_TOPICS" + "SINGLE\_STORE\_SELF\_JOIN"). "NO\_OPTIMIZATION" by default.

### application.server

**Type:** string

**Default:** ""

**Importance:** low

A host:port pair pointing to a user-defined endpoint that can be used for state store discovery and interactive queries on this KafkaStreams instance.

### auto.include.jmx.reporter

**Type:** boolean

**Default:** true

**Importance:** low

Deprecated. Whether to automatically include JmxReporter even if it's not listed in **metric.reporters**. This configuration will be removed in Kafka 4.0, users should instead include **org.apache.kafka.common.metrics.JmxReporter** in **metric.reporters** in order to enable the JmxReporter.

### buffered.records.per.partition

**Type:** int

**Default:** 1000

**Importance:** low

Maximum number of records to buffer per partition.

### built.in.metrics.version

**Type:** string

**Default:** latest

**Valid Values:** [latest]

**Importance:** low

Version of the built-in metrics to use.

### commit.interval.ms

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The frequency in milliseconds with which to commit processing progress. For at-least-once processing, committing means to save the position (ie, offsets) of the processor. For exactly-once processing, it means to commit the transaction which includes to save the position and to make the committed data in the output topic visible to consumers with isolation level read\_committed. (Note, if **processing.guarantee** is set to **exactly\_once\_v2**, **exactly\_once**, the default value is **100**, otherwise the default value is **30000**.)

### connections.max.idle.ms

**Type:** long

**Default:** 540000 (9 minutes)

**Importance:** low

Close idle connections after the number of milliseconds specified by this config.

### **default.client.supplier**

**Type:** class

**Default:** org.apache.kafka.streams.processor.internals.DefaultKafkaClientSupplier

**Importance:** low

Client supplier class that implements the **org.apache.kafka.streams.KafkaClientSupplier** interface.

### **default.dsl.store**

**Type:** string

**Default:** rocksDB

**Valid Values:** [rocksDB, in\_memory]

**Importance:** low

The default state store type used by DSL operators.

### **metadata.max.age.ms**

**Type:** long

**Default:** 300000 (5 minutes)

**Valid Values:** [0,...]

**Importance:** low

The period of time in milliseconds after which we force a refresh of metadata even if we haven't seen any partition leadership changes to proactively discover any new brokers or partitions.

### **metric.reporters**

**Type:** list

**Default:** ""

**Importance:** low

A list of classes to use as metrics reporters. Implementing the **org.apache.kafka.common.metrics.MetricsReporter** interface allows plugging in classes that will be notified of new metric creation. The JmxReporter is always included to register JMX statistics.

### **metrics.num.samples**

**Type:** int

**Default:** 2

**Valid Values:** [1,...]

**Importance:** low

The number of samples maintained to compute metrics.

### **metrics.recording.level**

**Type:** string

**Default:** INFO

**Valid Values:** [INFO, DEBUG, TRACE]

**Importance:** low

The highest recording level for metrics.

### **metrics.sample.window.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The window of time a metrics sample is computed over.

**poll.ms**

**Type:** long

**Default:** 100

**Importance:** low

The amount of time in milliseconds to block waiting for input.

**probing.rebalance.interval.ms**

**Type:** long

**Default:** 600000 (10 minutes)

**Valid Values:** [60000,...]

**Importance:** low

The maximum time in milliseconds to wait before triggering a rebalance to probe for warmup replicas that have finished warming up and are ready to become active. Probing rebalances will continue to be triggered until the assignment is balanced. Must be at least 1 minute.

**receive.buffer.bytes**

**Type:** int

**Default:** 32768 (32 kibibytes)

**Valid Values:** [-1,...]

**Importance:** low

The size of the TCP receive buffer (SO\_RCVBUF) to use when reading data. If the value is -1, the OS default will be used.

**reconnect.backoff.max.ms**

**Type:** long

**Default:** 1000 (1 second)

**Valid Values:** [0,...]

**Importance:** low

The maximum amount of time in milliseconds to wait when reconnecting to a broker that has repeatedly failed to connect. If provided, the backoff per host will increase exponentially for each consecutive connection failure, up to this maximum. After calculating the backoff increase, 20% random jitter is added to avoid connection storms.

**reconnect.backoff.ms**

**Type:** long

**Default:** 50

**Valid Values:** [0,...]

**Importance:** low

The base amount of time to wait before attempting to reconnect to a given host. This avoids repeatedly connecting to a host in a tight loop. This backoff applies to all connection attempts by the client to a broker.

**repartition.purge.interval.ms**

**Type:** long

**Default:** 30000 (30 seconds)

**Valid Values:** [0,...]

**Importance:** low

The frequency in milliseconds with which to delete fully consumed records from repartition topics. Purging will occur after at least this value since the last purge, but may be delayed until later. (Note, unlike **commit.interval.ms**, the default for this value remains unchanged when **processing.guarantee** is set to **exactly\_once\_v2**).

**request.timeout.ms****Type:** int**Default:** 40000 (40 seconds)**Valid Values:** [0,...]**Importance:** low

The configuration controls the maximum amount of time the client will wait for the response of a request. If the response is not received before the timeout elapses the client will resend the request if necessary or fail the request if retries are exhausted.

**retries****Type:** int**Default:** 0**Valid Values:** [0,...,2147483647]**Importance:** low

Setting a value greater than zero will cause the client to resend any request that fails with a potentially transient error. It is recommended to set the value to either zero or **MAX\_VALUE** and use corresponding timeout parameters to control how long a client should retry a request.

**retry.backoff.ms****Type:** long**Default:** 100**Valid Values:** [0,...]**Importance:** low

The amount of time to wait before attempting to retry a failed request to a given topic partition. This avoids repeatedly sending requests in a tight loop under some failure scenarios.

**rocksdb.config.setter****Type:** class**Default:** null**Importance:** low

A Rocks DB config setter class or class name that implements the **org.apache.kafka.streams.state.RocksDBConfigSetter** interface.

**send.buffer.bytes****Type:** int**Default:** 131072 (128 kibibytes)**Valid Values:** [-1,...]**Importance:** low

The size of the TCP send buffer (SO\_SNDBUF) to use when sending data. If the value is -1, the OS default will be used.

**state.cleanup.delay.ms****Type:** long**Default:** 600000 (10 minutes)**Importance:** low

The amount of time in milliseconds to wait before deleting state when a partition has migrated. Only state directories that have not been modified for at least **state.cleanup.delay.ms** will be removed.

**upgrade.from****Type:** string**Default:** null

**Valid Values:** [null, 0.10.0, 0.10.1, 0.10.2, 0.11.0, 1.0, 1.1, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.0, 3.1, 3.2, 3.3, 3.4]

**Importance:** low

Allows upgrading in a backward compatible way. This is needed when upgrading from [0.10.0, 1.1] to 2.0+, or when upgrading from [2.0, 2.3] to 2.4+. When upgrading from 3.3 to a newer version it is not required to specify this config. Default is **null**. Accepted values are "0.10.0", "0.10.1", "0.10.2", "0.11.0", "1.0", "1.1", "2.0", "2.1", "2.2", "2.3", "2.4", "2.5", "2.6", "2.7", "2.8", "3.0", "3.1", "3.2", "3.3", "3.4" (for upgrading from the corresponding old version).

### **window.size.ms**

**Type:** long

**Default:** null

**Importance:** low

Sets window size for the deserializer in order to calculate window end times.

### **windowed.inner.class.serde**

**Type:** string

**Default:** null

**Importance:** low

Default serializer / deserializer for the inner class of a windowed record. Must implement the **org.apache.kafka.common.serialization.Serde** interface. Note that setting this config in KafkaStreams application would result in an error as it is meant to be used only from Plain consumer client.

### **windowstore.changelog.additional.retention.ms**

**Type:** long

**Default:** 86400000 (1 day)

**Importance:** low

Added to a windows maintainMs to ensure data is not deleted from the log prematurely. Allows for clock drift. Default is 1 day.

## APPENDIX A. USING YOUR SUBSCRIPTION

AMQ Streams is provided through a software subscription. To manage your subscriptions, access your account at the Red Hat Customer Portal.

### Accessing Your Account

1. Go to [access.redhat.com](https://access.redhat.com).
2. If you do not already have an account, create one.
3. Log in to your account.

### Activating a Subscription

1. Go to [access.redhat.com](https://access.redhat.com).
2. Navigate to **My Subscriptions**.
3. Navigate to **Activate a subscription** and enter your 16-digit activation number.

### Downloading Zip and Tar Files

To access zip or tar files, use the customer portal to find the relevant files for download. If you are using RPM packages, this step is not required.

1. Open a browser and log in to the Red Hat Customer Portal **Product Downloads** page at [access.redhat.com/downloads](https://access.redhat.com/downloads).
2. Locate the **AMQ Streams for Apache Kafka** entries in the **INTEGRATION AND AUTOMATION** category.
3. Select the desired AMQ Streams product. The **Software Downloads** page opens.
4. Click the **Download** link for your component.

### Installing packages with DNF

To install a package and all the package dependencies, use:

```
dnf install <package_name>
```

To install a previously-downloaded package from a local directory, use:

```
dnf install <path_to_download_package>
```

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