

KIP-487: Client-side Automatic Topic Creation on Producer

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Status

Current state: *Under Discussion*

Discussion thread: [here](#)

JIRA: [here](#)

Please keep the discussion on the mailing list rather than commenting on the wiki (wiki discussions get unwieldy fast).

Motivation

Kafka has a feature that allows for the auto-creation of topics. Upon a produce or consume request, when fetching metadata for a topic that does not yet exist, the topic may be created if the broker enables topic auto creation. In the early days of Kafka, this was one of only a few ways to create topics. However, with the addition of AdminClient, this functionality is no longer the recommended way to create topics.

There are a few reasons the current implementation is not optimal. Metadata requests should not modify the metadata, or perform any other tasks besides obtaining the metadata. In addition, a consume request should not necessarily create a topic, since a consumer can retry until the topic is created and can actually consume.

However, many cloud users rely on the auto-create functionality. They often use software that they did not write and can not easily change that relies on auto-creation. Thus, moving the auto-create functionality to the producer will still support topic auto-creation, but will do away with some of the negative aspects of the current implementation. Auto-creation can then be configured on a client-by-client basis.

Public Interfaces

The producer will have a new configuration added.

Name	Description	Type	Default	Valid Values	Importance
producer.auto.create.topics	Configures how topic auto-creation will occur. 'False' does allow auto-topic creation. 'Server-side' allows the server to create the topic if the broker's 'auto.create.topics.enable' is true. 'Client-side' creates the topic client-side. Client-side auto-creation is only supported by brokers with version greater than 0.10.1.1.	String	allow-server-side	[false, allow-server-side, client-side]	medium

The goal is to deprecate automatic topic creation on the broker. At some point in the future, it may be useful to set the broker's `auto.create.topics.enable` default to false. However, for compatibility reasons, doing so is not possible at this time. Likewise, it would make sense to eventually change the default of the consumer's `allow.auto.create.topics` to false since it has no effect if the broker configuration is false.

Proposed Changes

The idea is to move the configuration and ability to automatically create topics client-side on the producer. Broker auto-topic creation will be deprecated. This includes deprecating the configuration 'auto.create.topics.enable' on the broker and 'allow.auto.create.topics' on the consumer. In the producer, auto-creation of a topic will occur through a specific request rather than through a side effect of requesting metadata. Unlike the configuration in the consumer, the ability to automatically create topics client-side will be independent of the server-side automatic topic creation controlled by the broker configuration.

If the broker config, 'auto.create.topics.enable' is set to true, a warning will be given that states the config is deprecated.

If server-side auto-creation is enabled with the broker's `auto.create.topics.enable`, the broker's defaults for partitions and replication factor will be used. When client-side auto-creation is enabled, broker-side defaults will be used if the broker supports KIP 464. Client-side auto-creation is not supported for older brokers.

Compatibility, Deprecation, and Migration Plan

This KIP argues for deprecation of the broker config `auto.create.topics.enable`. However, the default will remain true, so there will be no compatibility issues with current usage of the config and its functionality.

In order to automatically create topics with the producer, `producer.auto.create.topics` config must be set to 'client-side.' If the broker does not support KIP 464, `auto.create.num.partitions` and `auto.create.replication.factor` must be specified.

This KIP does not plan on changing the broker default. However, it is useful to understand compatibility issues if this were to happen.

- By default, 'allow-server-side' auto-creation is used. The broker's 'auto.create.topics.enable' must be configured as true.
 - Although the broker config and server-side auto-creation is deprecated, this is the default to ensure compatibility.
 - If the broker config is set to false, the topic will not be created automatically.
- Systems that rely on auto-creation would be encouraged to set the producer config `producer.auto.create.topics` to 'client-side.'
 - This will effectively override the deprecated broker config, so even if it is configured to true, the server will not auto-create topics.
 - Systems with older broker versions that do not support KIP-464 would not be compatible with this option.
- Systems that want to turn off auto-creation completely should set the producer config to false. This will override the broker config for this producer.
 - This will fulfill the same role as 'allow.auto.create.topics' on the consumer, but for the producer.
- Systems that utilize auto-creation on the consumer will no longer be able to do so with only the producer config enabled.
 - Enabling the broker config or making further changes to the code is required.

Rejected Alternatives

- Enabling true by default on the producer config:
 - Topic auto-creation is a feature that is not supported as it once was, so defaulting to false supports this trend towards using admin client to create topics. Auto-creation does not work on older brokers without configuration client-side anyway, so it might be more clear that configuration must be done in order to keep using this feature.
- Add configurations producer-side for replication factor, partitions of new topics
 - The idea is to keep this simple; configuring these values is not simple and could add to more issues for users.