The **@RetryableTopic** annotation is used in Spring Kafka to configure retry behaviour for a Kafka listener, specifying how many times a message should be retried, the strategy for creating retry topics, and the configuration for backoff between retries. Here's a detailed explanation of each attribute in the given annotation:

@RetryableTopic(

attempts = "3",

topicSuffixingStrategy = TopicSuffixingStrategy.SUFFIX\_WITH\_INDEX\_VALUE,

backoff = @Backoff(delay = 1000, maxDelay = 5\_000, random = true),

dltTopicSuffix = "dead-two"

)

**Attributes:**

1. **‘attempts’:** Specifies the number of retry attempts. In this case, it is set to ‘3’, meaning the message will be retried up to three times before being sent to the dead-letter topic if it still fails.
2. **‘topicSuffixingStrategy’**: Determines how retry topics are named. The **‘TopicSuffixingStrategy.SUFFIX\_WITH\_INDEX\_VALUE’** strategy appends an index value to the original topic name for each retry attempt. For example, if the original topic is ‘**myTopic’**, the retry topics could be named ‘**myTopic-0’, ‘myTopic-1’**, etc.
3. **‘backoff’:** Configures the delay between retry attempts. The ‘**@Backoff’** annotation inside this attribute provides the following settings:

* **‘delay’:** The initial delay between retries, set to 1000 milliseconds (1 second).
* **‘maxDelay’:** The maximum delay between retries, set to 5000 milliseconds (5 seconds).
* **‘random’:** If set to true, the delay will have a random component to prevent a thundering herd problem where many messages are retried simultaneously. This helps in spreading out the retry attempts over time.

1. **‘dltTopicSuffix’:** Specifies the suffix to be added to the original topic name for the dead-letter topic. In this case, it is set to **"dead-two".** If the original topic is ‘**myTopic’**, the dead-letter topic would be **‘myTopic-dead-two’**.

**Summary**

The provided ‘**@RetryableTopic’** annotation configures the following behaviour for the Kafka listener:

The listener will retry processing a message up to 3 times if it fails.

* Retry topics will be named using the original topic name with an index suffix, such as ‘**myTopic-0’, ‘myTopic-1’**, etc.
* There will be an initial delay of 1 second between retries, which can go up to a maximum of 5 seconds, with randomization to spread out the retries.
* If the message still fails after the configured retry attempts, it will be sent to a dead-letter topic with the suffix ‘**dead-two’**.

This configuration ensures that **messages are retried a specified number of times with controlled delays and randomness, and ultimately ensures that problematic messages are redirected to a dead-letter topic for further inspection and handling**.