Kafka Workflow as a Pub-Sub Messaging

- Producer publish the message on a topic.
- Kafka Broker stores the messages int he partition configured by Partition Topic. If producer didi not specify the partition, the broker ensures that the messages are equally shared between partitions. If Producer sends two messages and we have two partition, Kafka wil stre one min Partition 1 and another in Partition 2.
- Consumer subscribe to a partition topic.
- Once consumer subscribe to a topic, Kafka will provide the current offset of the topic to the Consumer and also saves the offset tot he Zookeeper.
- Consumer will request to Kafka at regular interval for new messages.
- Once Kafka receives the message from producer, it forward these messages to the consumer.
- Consumer will receive message and process it.
- Once a message is received by consumer it will sent the acknowledgement to Kafka Broker.
- Upon receiving the acknowledgement, Kafka increment the offset and updates it to the zookeeper. Since offset is maintained at zookeeper, the consumer can read the next message correctly, even during the broker outage.
- The above flow will repeat until the consumer stops sending request.
- Consumer can rewind/skip to the designed offset of a topic at any time and read the subsequent messages.

Kafka Workflow for Consumer Group

Instead of single consumer, a group of consumer from one Consumer group subscribe to a topic, and the messages are shared among them.

- Producer publishes a message on a topic.
- Kafka Stores the message int he partitions configured for the partition topic.
- A single consumer subscribe to a specific topic, assume **Topic - 1** with Group Id as **Group - 1**
- Kafka interacts with the consumer into the same way as pub-sub messaging until a new Consumer Subscribe to the same topic.
- Once the new consumer arrives, Kafka Switches its operation tot share mode, such that each message is passed to only one of the subscriber of the Consumer Group => CG 1. This message transfer is similar to the queue-based messaging as only one consumer of the group consumes a message. Contrary to queue-based messaging, messages are not removed after consumption.
- The message transfer can go on until the number of consumers, react as per the number of partitions, configured for that partition topic.
- Once the consumer > partition, the new consumer will not receive messages until existing subscribers/consumers opts to be out. New Consumer have to wait or to be in ideal stage if number of partitions are occupied.