Consumer Groups

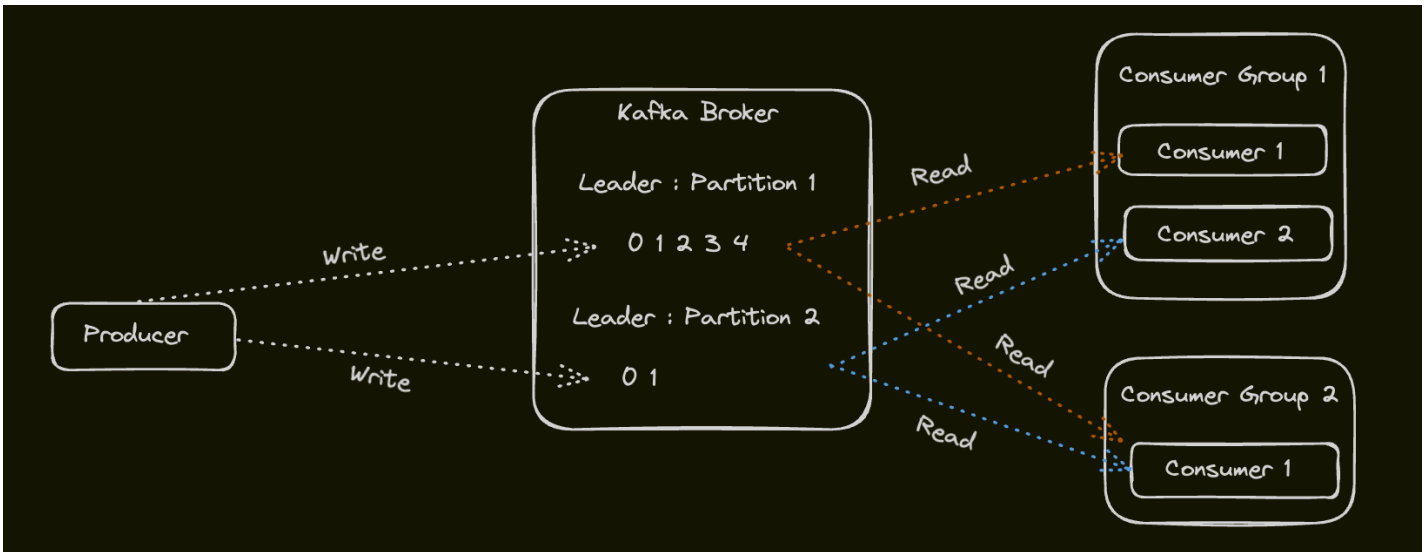
What is Consumer Group ?

A set of one or more consumer working in parallel to consume message from topic partitions. Message are equally divided among all the consumers of a group, with no two receives the same message.

Distributing partitions to Consumers with in a Consumer Group

Kafka ensures that a single consumer read messages from any partition with in a Consumer group. In another word, topic partitions are a unit of of parallelism - only one consumer can work on a partition in a Consumer group.

Example : In a group. If consumers are C1, C2, C3, C1 can only read from partition P1and C2 can't read from P1.



Distributing partitions to Consumers with in a Consumer Group Caption

If consumer stops, kafka aligns another consumer in the same Consumer group, same in case of any consumer stops/deletes.Example : If C1 deletes, the Consumer Group will tell C2 to start reading from Partition P1.

Basically it rebalances with in the Consumer Group, by using alternatives of other consumer in the group.

- Due to different consumers parallelly reading from Topic Partition, the throughput is very high.
- There can be np more consumers than partitions.
- Kafka stores the current offset per Consumer Group per Topic Per partition. This means a single message is sent to a single consumer of a Consumer Group and the load is balanced across Consumers as equally as possible.
- Consumers sit in ideal/wait until on existing consumer unsubscribe to a partition. Similarly, as new consumers join a Consumer Group, Kafka initiates a rebalancing if there are more consumers than partitions. Kafka uses any ideal consumer as a backup of failovers.
  - **Numbers of Consumer = Numbers of Partition** : Each consumer will consume 1 Partition.
  - **Numbers of Consumer > Numbers of Partition** : Some Consumers will be ideal.
  - **Numbers of Consumer = Numbers of Partition** : Some Consumers will consumer more than one partition.