1. Text

   Description automatically generated
2. 
3. In the last lecture, we discussed how replicas are distributed among the Brokers in a cluster.
4. **Agenda**:
   1. Responsibility of leaders and followers.
5. 
6. We learnt that a broker manages two kinds of partitions.  
   
7. Based on the partition type, a typical broker performs two kinds of activities 
8. Let’s try to understand with an example:  
   A screenshot of a computer

   Description automatically generated with medium confidence
9. **What does it mean by a Broker to act as a Leader or follower**?
   1. Graphical user interface, application

      Description automatically generated
   2. Let’s assume a producer wants to send some msgs to a Kafka Topic.
   3. So, the producer will connect with one of the brokers in the cluster and queries for **meta data**.  
      All the brokers in the cluster can answer the **metadata request**. Hence, a producer can connect with any broker.  
      The metadata contains a list of leader partitions, their respective host and port information.  
      **Metadata response = All Leader Partitions info + Hosts + Ports**
   4. Now the producer has a list of all leaders.  
      It is the producer who decides on which partition it wants to send the data (as a msg can be saved in any partition of a topic to which we want to send the msg.), and accordingly sends the msg to the respective broker.  
      That is the producer directly transmits the msg to the leader itself.
   5. On receiving the msg, the Leader Broker persists the msg in the Leader Partition & sends back an **acknowledgement**.   
      Graphical user interface

      Description automatically generated  
      Similarly, if a consumer wants to read msg from a topic, it reads directly from the leader.  
      Diagram

      Description automatically generated with low confidence  
      We will go into details about producer and consumer later on.  
      **However, you should be aware that producer & consumer always interact with the leader brokers.**And that is responsibility of the Leader Broker to fulfil all the requests from a Producer & a Consumer.
10. **Let’s come back to the follower.**
    1. Kafka Broker also acts as a follower for the allocated follower partitions.
    2. A picture containing graphical user interface

       Description automatically generated
    3. A follower broker doesn’t serve producer & consumer requests.
    4. Their only job is to copy msgs from the leader partition and stay up to date with all the msgs in the leader partition.
    5. The aim of the follower is to get elected as a leader when the current leader fails or dies.  
       So, they have a single point agenda 🡪 Stay in sync with leader.  
       Because they can’t be elected as leader if they are falling behind the leader and fail to be in sync with the leader by copying all the msgs.
11. Next question is this: **How does a Follower stay in sync with the leader?**
    1. A follower connects with the leader and requests for the data.
    2. The leader sends some msgs and follower persists them in the replica and requests for more msgs.
    3. This goes on forever as an infinite loop to ensure that the followers are in sync with the leader.  
       A picture containing chart

       Description automatically generated
12. A screenshot of a computer

    Description automatically generated