01 KAFKA VS PubSub 

Feature	Kafka	Cloud Pub/Sub
Architecture	A distributed streaming platform that operates as a cluster of brokers. It uses a pull-based mechanism where consumers pull messages from topics. Kafka stores messages on disk, allowing for durable and persistent storage.	A fully managed service provided by Google Cloud that operates on a **serverless** architecture. It uses a push-based model where messages can be pushed to subscribers or pulled by them, depending on the configuration.
Deployment	Requires self-hosting and management of clusters, including broker configuration, scaling, and maintenance. You can run it on-premises or on cloud infrastructure.	Fully managed service, meaning Google takes care of infrastructure management, scaling, and reliability, allowing you to focus on building applications.
Scalability	Highly scalable; you can add brokers to a cluster to handle more data. It requires careful partitioning to optimize performance.	Automatically scales based on the workload. You don't need to manage partitions or scaling manually.
Message Retention	Allows you to configure retention policies (time-based or size-based), meaning messages can be retained for long periods (days, weeks, or even indefinitely).	Messages are retained for a default of 7 days (extendable to 30 days) but are generally intended for real-time processing.
Message Ordering	Guarantees message ordering within a partition, making it suitable for use cases where order is critical.	Does not guarantee strict ordering across messages but can offer ordered delivery for messages published to a specific subscription if configured.
Use Cases	Commonly used for event sourcing, stream processing, and building data pipelines. It excels in scenarios requiring high throughput and low latency.	Well-suited for event-driven architectures, real-time analytics, and systems where you want to decouple producers and consumers without managing infrastructure.
Integration	Integrates well with many data processing frameworks like Apache Spark, Apache Flink, and others.	Integrates seamlessly with other Google Cloud services like Dataflow, BigQuery, and Cloud Functions.

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