**Alternative Approach: Using AWS Kinesis**

AWS Kinesis Data Streams is a fully managed event streaming service that can also be used for replaying and recalculating missing or incorrect events. The approach would be:

1)**Replay Past Events with AT\_TIMESTAMP** – Fetch historical data from Kinesis up to 7 days old.

2)**Recalculate Missing or Incorrect Data** – Use AWS Lambda, AWS Glue, or Kinesis Data Analytics (Apache Flink).

3)**Publish Corrected Data** – Store corrected results in another Kinesis stream or S3 for analytics.

**Key Advantages of Kafka Over Kinesis:**

* Kafka provides infinite event retention, whereas Kinesis can only store data for up to 7 days.
* Kafka can handle millions of events per second with low latency (~1ms), while Kinesis is limited by shard capacity.
* Kafka scales horizontally with partitions, whereas Kinesis requires pre-allocated shards.
* Kafka has lower long-term costs, whereas Kinesis costs increase with throughput and retention requirements.
* Kafka Streams offers better real-time stateful processing, whereas Kinesis Analytics (Flink) is more limited.

**When to Choose Kinesis Over Kafka**

Kinesis can be a better choice if:

* You don’t want to manage infrastructure – Kinesis is fully managed, whereas Kafka requires setting up brokers.
* You have small to medium event volume and don't need massive scalability.
* Your system is AWS-native, and you want tight integration with Lambda, S3, and DynamoDB.

**Conclusion:** Kafka is the Best Choice for Large-Scale Event Recovery

For a system processing millions of events per hour, Kafka is the superior choice because of its: Unlimited event retention & replay, Low-latency, high-throughput processing, Better scalability with partitions and consumer groups and Lower cost at scale compared to Kinesis’ pay-per-shard model

While Kinesis is a solid AWS-managed solution, Kafka provides better flexibility, cost efficiency, and performance for real-time event-driven systems.

**Snapshots of Corrected Data and Incorrect Data from AWS Kinesis:**

A screenshot of a computer

AI-generated content may be incorrect.

