Cost Analysis for Architectures

Assumptions:

- Metrics: 500 metrics filtered every minute.

- Data Size: Each metric event = 1 KB.

- Monthly Duration: 43,200 minutes (30 days × 24 hours × 60 minutes).

- Total Data: 0.5 MB/min × 43,200 = 21.6 GB/month.

First Architecture:

1. CloudWatch Metric Streams:

   - Total updates: 500 × 43,200 = 21,600,000 updates.

   - Cost: 21,600,000 / 1,000 × 0.003 = 64.8 USD/month.

2. Kinesis Firehose (HTTP Delivery):

   - Data ingestion: 21.6 GB.

   - Cost: 21.6 × 0.029 = 0.63 USD/month.

3. S3 Storage (for 2 days retention):

   - Stored data: 21.6 GB/month ÷ 15 = 1.44 GB/day.

   - Cost for 2 days: 1.44 × 2 × 0.023 = 0.066 USD/month.

Total Monthly Cost (First Architecture):

65.5 USD/month

Second Architecture:

1. CloudWatch Metric Streams:

- Total updates: 21,600,000.

- Cost: 64.8 USD/month.

2. Kinesis Firehose (S3 Delivery):

- Data ingestion: 21.6 GB.

- Cost: 21.6 × 0.029 = 0.63 USD/month.

3. S3 Storage (for 7 days retention):

- Stored data: 21.6 GB/month ÷ 4.3 = 5.02 GB/day.

- Cost for 7 days: 5.02 × 7 × 0.023 = 0.81 USD/month.

4. Lambda Execution:

- Total invocations: 21,600.

- Execution time: 5 seconds/event.

- Memory: 128 MB.

  - Compute cost:

    21,600 × 5 × (128 / 1,024) × 0.0000166667 = 22.1 USD/month.

  - Invocation cost:

    21,600 ÷ 1,000,000 × 0.20 = 0.0043 USD/month.

Total Monthly Cost (Second Architecture):

88.34 USD/month

Cost Comparison:

- First Architecture: 65.5 USD/month.

- Second Architecture: 88.34 USD/month (with 5s/event Lambda execution).

Key Notes:

- The first architecture is more cost-effective, but the second architecture provides longer storage retention and additional processing flexibility.