Product API Solution Cost Analysis Estimate Report

Service Overview

Product API Solution is a fully managed, serverless service that allows you to This project uses multiple AWS services.. This service follows a pay-as-you-go pricing model, making it cost-effective for various workloads.

Pricing Model

This cost analysis estimate is based on the following pricing model:
- **ON DEMAND** pricing (pay-as-you-go) unless otherwise specified
- Standard service configurations without reserved capacity or savings plans
- No caching or optimization techniques applied

Assumptions

- Standard ON DEMAND pricing model for all services
- US East (N. Virginia) region deployment
- Node.js 18.x runtime for Lambda functions with 512MB memory allocation
- Average Lambda execution time of 200ms per request
- DynamoDB on-demand billing mode with standard storage
- API Gateway REST API (not HTTP API) for full feature compatibility
- No caching enabled on API Gateway
- Standard CloudWatch logging enabled
- No reserved capacity or savings plans applied
- Product data size averaging 2KB per item
- No data transfer costs between services in same region

Limitations and Exclusions

- Data transfer costs to/from internet
- CloudWatch custom metrics and alarms
- AWS X-Ray tracing costs
- Development and testing environment costs
- Domain name and SSL certificate costs
- Backup and disaster recovery costs beyond standard features
- Third-party monitoring tools
- Support plan costs

Cost Breakdown

Unit Pricing Details

Service	Resource Type	Unit	Price	Free Tier
AWS Lambda	Requests	request	$0.0000002	1M requests and 400,000 GB-seconds per month free for first 12 months
AWS Lambda	Compute	GB-second	$0.0000166667	1M requests and 400,000 GB-seconds per month free for first 12 months
Amazon API Gateway	Requests	million requests (first 333M), $2.80 per million (next 667M)	$3.50	No free tier for API Gateway
Amazon DynamoDB	Read Requests	million read request read requests	$0.125	25GB storage and 25 RCU/WCU hours free for first 12 months
Amazon DynamoDB	Write Requests	million write request write requests	$0.625	25GB storage and 25 RCU/WCU hours free for first 12 months
Amazon DynamoDB	Storage	GB-month (after 25GB free)	$0.25	25GB storage and 25 RCU/WCU hours free for first 12 months
Amazon CloudWatch	Log Ingestion	GB ingested	$0.50	5GB log ingestion and 10 custom metrics free per month
Amazon CloudWatch	Log Storage	GB-month	$0.03	5GB log ingestion and 10 custom metrics free per month

Cost Calculation

Service	Usage	Calculation	Monthly Cost
AWS Lambda	5 functions processing API requests with 512MB memory allocation	($0.0000002 Ã— requests) + ($0.0000166667 Ã— GB-seconds)	$2.50 - $25.00
Amazon API Gateway	REST API handling HTTP requests with 5 endpoints	$3.50/1M Ã— request_count (for first 333M requests)	$3.50 - $350.00
Amazon DynamoDB	Single table with on-demand billing for product data storage	($0.125/1M Ã— reads) + ($0.625/1M Ã— writes) + ($0.25 Ã— GB_storage)	$1.25 - $125.00
Amazon CloudWatch	Standard logging and basic monitoring for Lambda and API Gateway	$0.50 Ã— GB_logs_ingested + $0.03 Ã— GB_logs_stored	$0.50 - $5.00
Total	**All services**	**Sum of all calculations**	**$7.75/month**

Free Tier

Free tier information by service:
- **AWS Lambda**: 1M requests and 400,000 GB-seconds per month free for first 12 months
- **Amazon API Gateway**: No free tier for API Gateway
- **Amazon DynamoDB**: 25GB storage and 25 RCU/WCU hours free for first 12 months
- **Amazon CloudWatch**: 5GB log ingestion and 10 custom metrics free per month

Cost Scaling with Usage

The following table illustrates how cost estimates scale with different usage levels:

Service	Low Usage	Medium Usage	High Usage
AWS Lambda	$1/month	$2/month	$5/month
Amazon API Gateway	$1/month	$3/month	$7/month
Amazon DynamoDB	$0/month	$1/month	$2/month
Amazon CloudWatch	$0/month	$0/month	$1/month

Key Cost Factors

- **AWS Lambda**: 5 functions processing API requests with 512MB memory allocation
- **Amazon API Gateway**: REST API handling HTTP requests with 5 endpoints
- **Amazon DynamoDB**: Single table with on-demand billing for product data storage
- **Amazon CloudWatch**: Standard logging and basic monitoring for Lambda and API Gateway

Projected Costs Over Time

The following projections show estimated monthly costs over a 12-month period based on different growth patterns:

Base monthly cost calculation:

Service	Monthly Cost
AWS Lambda	$2.50
Amazon API Gateway	$3.50
Amazon DynamoDB	$1.25
Amazon CloudWatch	$0.50
Total Monthly Cost	**$7**

Growth Pattern	Month 1	Month 3	Month 6	Month 12
Steady	$7/mo	$7/mo	$7/mo	$7/mo
Moderate	$7/mo	$8/mo	$9/mo	$13/mo
Rapid	$7/mo	$9/mo	$12/mo	$22/mo

* Steady: No monthly growth (1.0x)
* Moderate: 5% monthly growth (1.05x)
* Rapid: 10% monthly growth (1.1x)

Detailed Cost Analysis

Pricing Model

ON DEMAND

Exclusions

- Data transfer costs to/from internet
- CloudWatch custom metrics and alarms
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- Development and testing environment costs
- Domain name and SSL certificate costs
- Backup and disaster recovery costs beyond standard features
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Recommendations

Immediate Actions

- Start with on-demand billing for DynamoDB to handle variable workloads cost-effectively
- Monitor Lambda execution times and optimize code to reduce compute costs
- Consider API Gateway HTTP API instead of REST API for 70% cost savings if advanced features aren't needed
- Implement efficient pagination to reduce DynamoDB read costs
- Use CloudWatch log retention policies to control storage costs
Best Practices

- Monitor usage patterns and consider provisioned capacity for DynamoDB if traffic becomes predictable
- Implement caching strategies to reduce database and Lambda invocations
- Use AWS Cost Explorer to track spending and identify optimization opportunities
- Consider Reserved Instances for Lambda if usage becomes consistent
- Implement proper error handling to avoid unnecessary retries and costs

Cost Optimization Recommendations

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Conclusion

By following the recommendations in this report, you can optimize your Product API Solution costs while maintaining performance and reliability. Regular monitoring and adjustment of your usage patterns will help ensure cost efficiency as your workload evolves.