FinOps Case Study: AWS Static Website Cost Modeling and Optimization

Overview

This case study examines the cloud economics of a static website hosted on AWS. It explores cost modeling, usage assumptions, service-level breakdowns, and the impact of basic cost optimizations.

Architecture Breakdown

Layer	AWS Service(s)
Frontend	Amazon S3 (static HTML/CSS/JS)
CI/CD	GitHub Actions (dry-run + fallback)
Storage	S3 with bucket policies (no ACLs)
Networking	CloudFront CDN + Route 53 DNS
Logic	Lambda Function URL (visitor tracking)
Database	DynamoDB (on-demand + TTL)
Monitoring	S3 Access Logs + CloudWatch (Lambda)
Security	IAM roles, least privilege, CORS

Usage Assumptions

- **Traffic Pattern**: 2,500 visitors/month steady-state
- **Asset Load**: ~1 MB per visitor
- **Lambda**: x86, 120ms average duration
- **DynamoDB**: On-demand reads/writes with TTL enabled
- **Route 53**: One hosted zone, standard query volume
- **Monitoring**: CloudWatch logs for Lambda + S3 access logs

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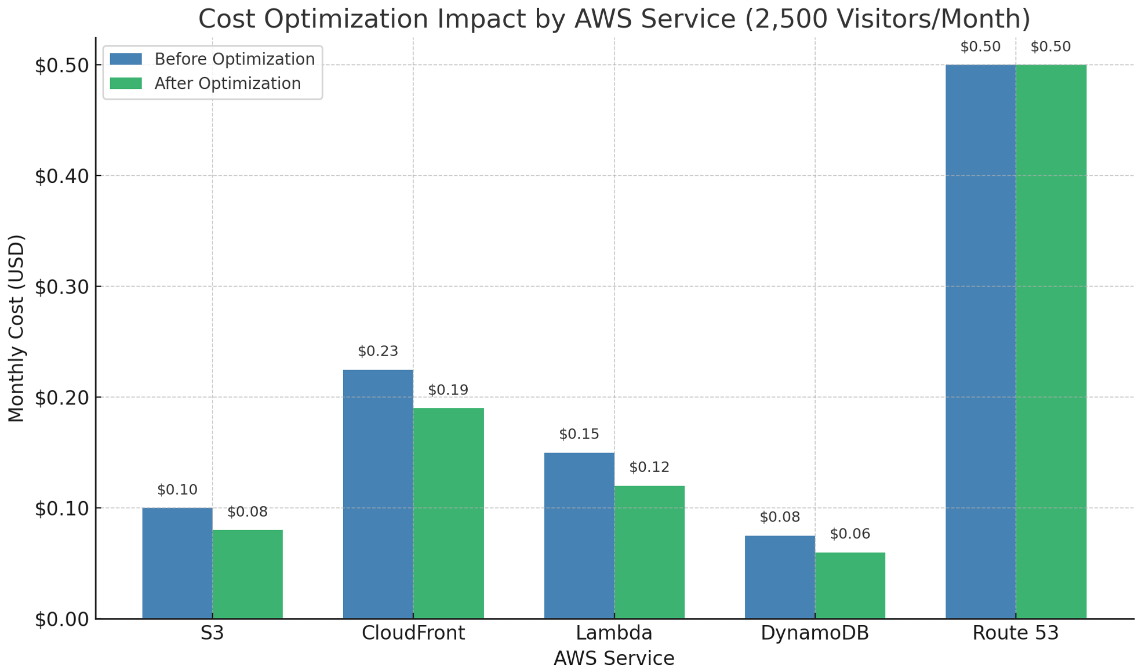
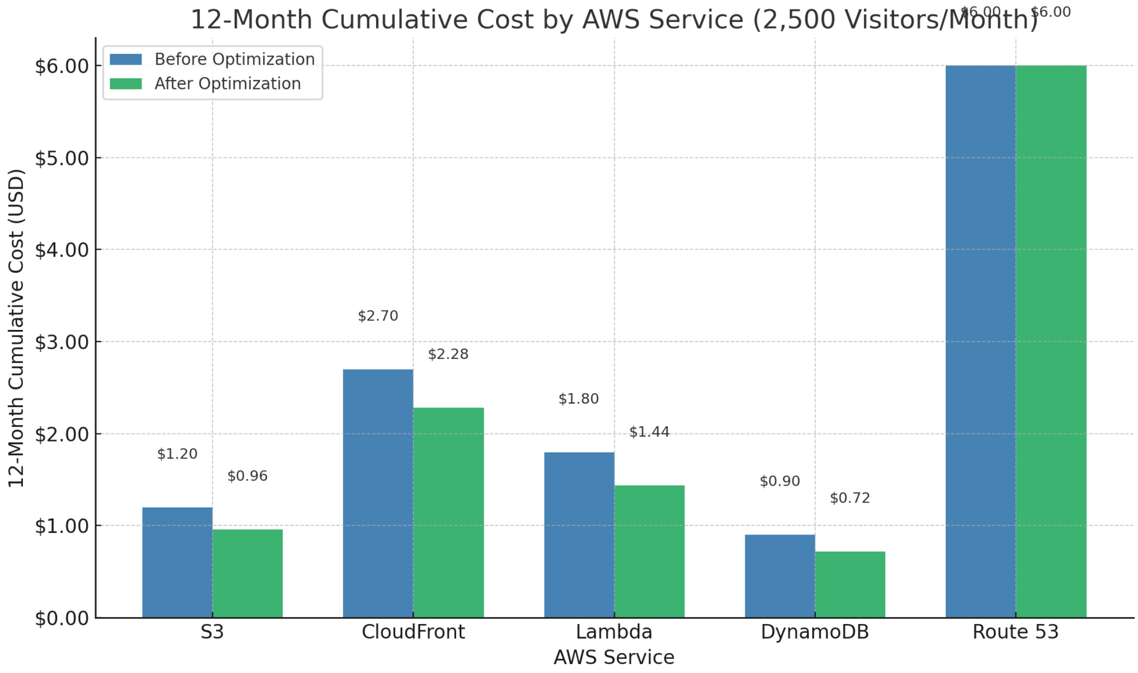
Monthly Cost @ 2,500 Visitors



Yearly Cost by AWS Service



Summary Analysis

Cost Drivers

- **CloudFront** and **Lambda** were the top cost contributors under initial modeling.
- **Route 53** remained flat across usage levels.

Optimization Techniques Applied

- Enabled **aggressive CloudFront caching** to reduce origin fetches.
- Reduced **Lambda memory** and execution time.
- Converted S3 to **intelligent tiering** to reduce storage cost.
- Added TTL and partitioning to **DynamoDB** for storage efficiency.

Results

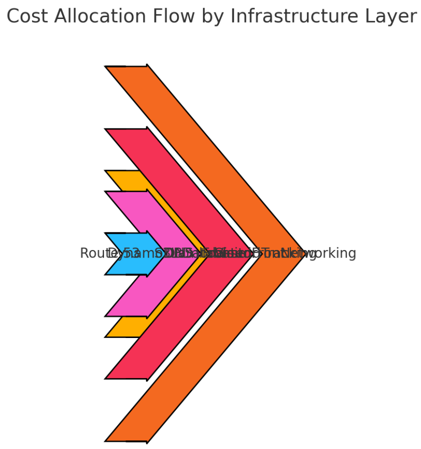
- Achieved a **~25% reduction** in overall monthly spend at low traffic levels.
- Demonstrated significant **annual savings** in a stable usage scenario.

FinOps Takeaways

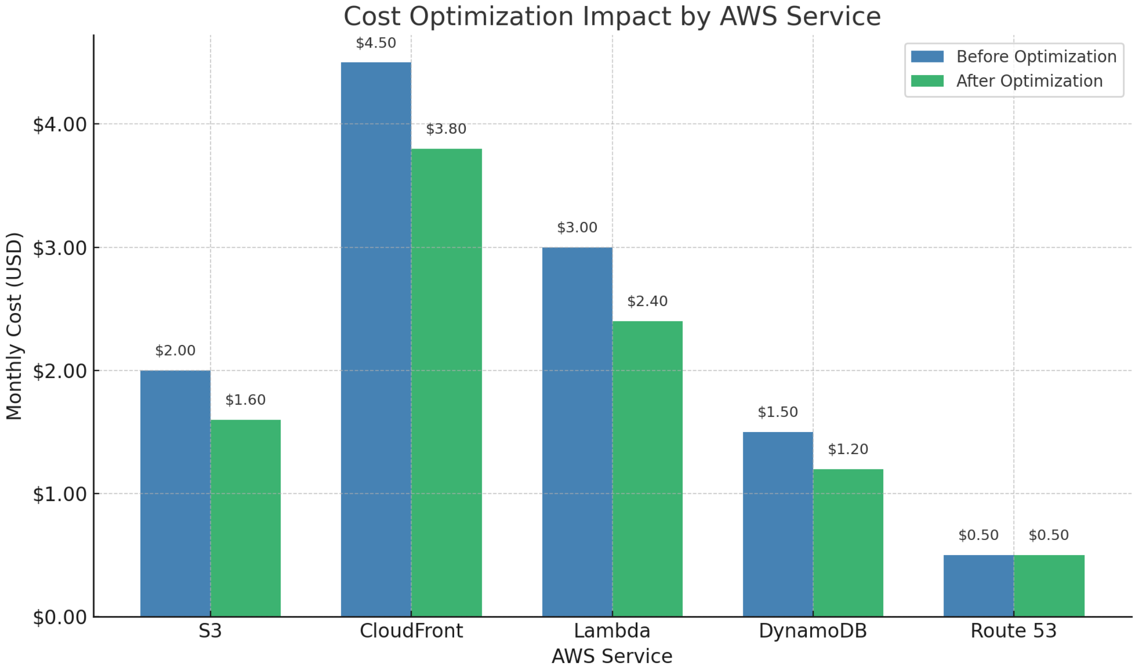
| Principle | Action Taken | |----------------------|--| | **Right-sizing** | Tuned Lambda memory and timeout | | **Elasticity** | Used on-demand DynamoDB, Lambda scaling | | **Cost Visibility** | AWS Budgets, dashboards, usage alerts enabled | | **Optimization** | CDN cache tuning, asset compression | | **Cost Allocation** | Layer-to-service Sankey flow chart (see appendix) |

Appendix

Cost Allocation Flow



Optimization Impact at 50K Visitors


Cost Optimization Impact by AWS Service
Before Optimization
After Optimization
Monthly Cost (USD)
$0.00
$1.00
$2.00
$3.00
$4.00
S3
CloudFront
Lambda
DynamoDB
Route 53
AWS Service
$2.00
$1.60
$4.50
$3.80
$3.00
$2.40
$1.50
$1.20
$0.50
$0.50