Cloud Optimization Assessment Report

Contents

1. Introduction

Organizations often fail to plan and strategize cloud cost management while starting a journey for cloud adoption. It is important to plan and manage the use of services, resources, and configurations for workloads for cost optimization. While building technology solutions on the cloud platform, if the key parameters such as security, reliability, performance efficiency, sustainability, and operational excellence are neglected, it can become challenging to build a system that delivers efficiently on the expectations and functional requirements.

eInfochips' Snapbricks Cloud Optimization Assessment framework can help in finding gaps in the current cloud environment and provide suggestions including complete infrastructure cost administration, policy set-up, security infringements, NOC / cloud management, SLA observance and an improvement plan. This document provides a sample of cloud optimization assessment conducted for a multi-million-dollar Home Automation Company based out of the USA.

2. Cloud Optimization Assessment for Home Automation Company

2.1. Executive Summary

The client is a leading provider of smart home products. Their large camera network for smart home application was supported by AWS infrastructure. Their Total Cost of Ownership (TCO) started growing as the company started to scale with an increase in subscribers count, data, events, and videos uploaded on the cloud each day.

eInfochips' Cloud Optimization Assessment framework has helped the client improvise success by enhancing their overall solution across five distinct areas –Reliability, Security, Performance, Cost Optimization, and Operational Excellence. Our experienced team of AWS certified professionals helped them identify, analyze, and recommend an action plan that benefited the customer with:

- More control over and visibility into AWS cloud spend and utilization
- Use resources efficiently and maintain the performance efficiency as demand changes
- Set up processes for threat detection and standardized security implementation
- Support development and gain operational excellence
- Optimization opportunities to set up a lean process

2.2. Client Profile

The client is a leading player in smart home IoT products and offers a cloud-based platform with a variety of connected devices such as security cameras, smart lights, smart doorbells etc. When it comes to counting the number of videos uploaded per day on their cloud platform, it is more than Instagram and when it comes to hours of video uploaded per minute on their platform it is more than that of YouTube.

2.3. Challenges

The client's smart home products infrastructure is supported using AWS. There are 22M+ devices deployed in 5.8M+ homes across 4 different geographies with 15+ variants and 10+ partner integrations. The cloud-centric infrastructure comprised of ~3800 servers on AWS at a $2.5M monthly cloud spend.

With the deployment of millions of devices, 900k paid subscriber count, 143M events, 75M+ smart notifications, and 219M videos being uploaded/day, the client started facing issues in maintaining performance, security, and reliability to drive higher ROI. It was to scale as there were conflicting resource requirement for different modules.
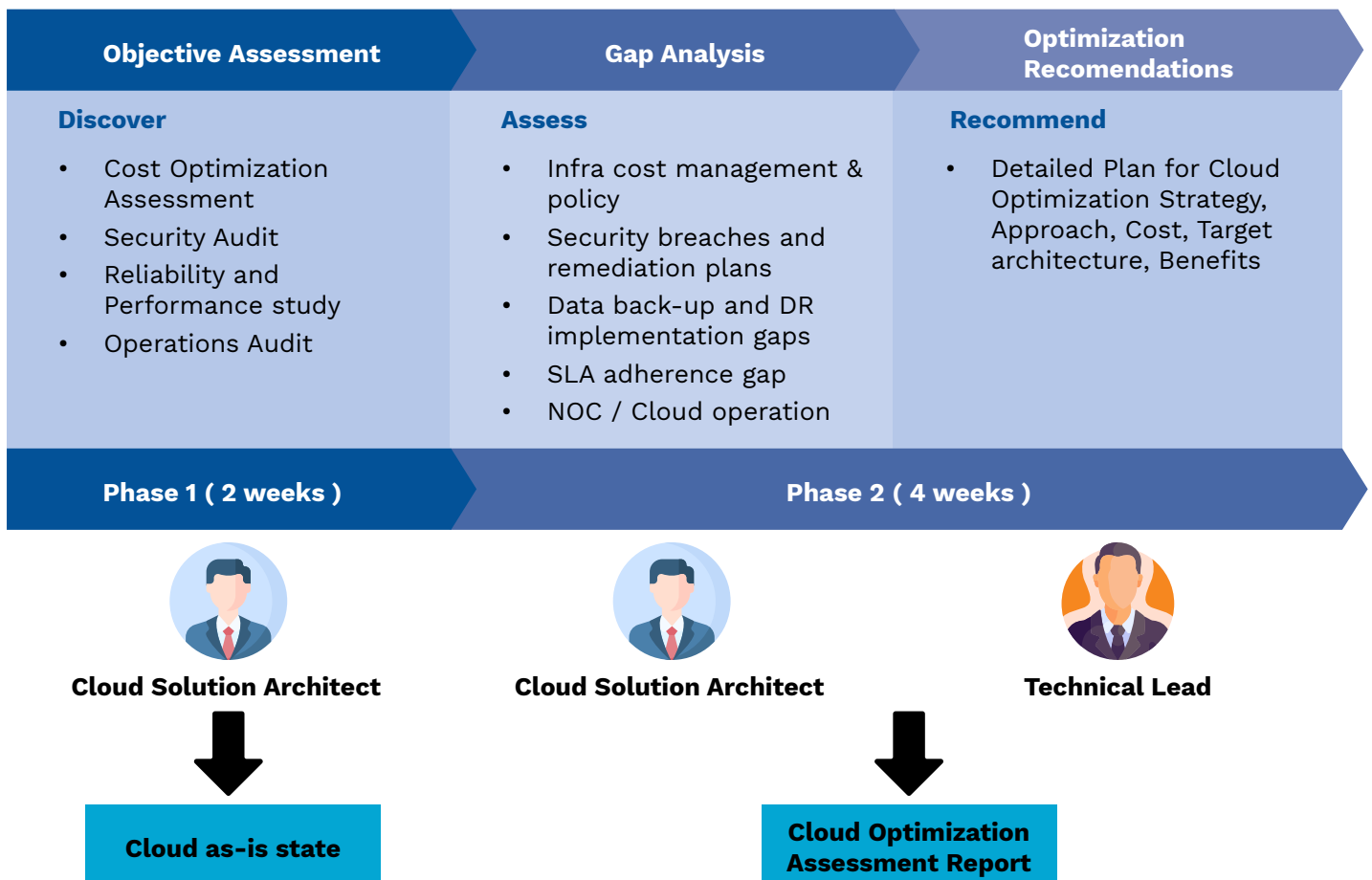
Streamlining the cloud operations and enhancing cost efficiency were priority for client while following industry best practices. Consequently, the client wanted to evaluate their cloud consumption so they can improve cloud monitoring, uncover cloud cost savings opportunities, and eliminate unnecessary features to improve overall cloud performance.

3. Cloud Optimization Assessment Solution for Home Automation company

eInfochips applied its proprietary Cloud Optimization Assessment framework and helped the client come up with a clear plan for managing workloads to reduce costs and improve performance by analyzing historical utilization metrics.

3.1. Snapbricks Cloud Optimization Assessment Framework

eInfochips' Snapbricks Cloud Optimization Assessment Framework (SCOAF) is designed to assist customers who have already moved their applications and workload to the cloud and intend to optimize their overall solution across five distinct areas – Cost Optimization, Security, Reliability, Performance and Operational Excellence. With proven methodologies and tools, our cloud experts engage with clients in a two-phase process:

Objective Assessment	Gap Analysis	Optimization Recomendations
Discover	**Assess**	**Recommend**
• Cost Optimization Assessment • Security Audit • Reliability and Performance study • Operations Audit	• Infra cost management & policy • Security breaches and remediation plans • Data back-up and DR implementation gaps • SLA adherence gap • NOC / Cloud operation	• Detailed Plan for Cloud Optimization Strategy, Approach, Cost, Target architecture, Benefits
Phase 1 (2 weeks)	**Phase 2 (4 weeks)**	

Cloud Solution Architect   **Cloud Solution Architect**   **Technical Lead**

Cloud as-is state   **Cloud Optimization Assessment Report**

An objective assessment of all five pillars stated above is carried out over the course of two weeks. During this phase, eInfochips' Cloud Solution Architect engages with the customer to discover the current infrastructure, asset allocation policy and lifecycle management protocols as part of the cost optimization assessment. As part of the security audit, vulnerabilities, customer privacy, policy adherence and industry compliances are assessed.

A Reliability and Performance study on data backup, disaster recovery, and auto-scaling policies is also carried out. A NOC/Cloud operation audit & SLA/KPI identification are carried out as part of the Operations audit and an As-Is report(current state of solution) on all the above parameters is shared at the end of this phase.

A gap analysis is carried out and best practice recommendations are provided covering overall infrastructure cost management & policy set-up, security breaches and remediation plans, data back-up, DR implementation gaps & improvements, overall NOC / Cloud operation, SLA adherence gap and an improvement plan. The Cloud Solution Architect and Technical Lead provide a detailed Cloud Optimization Assessment Report at the end of this phase.

3.2. Phase 1: Assessment for Cloud As-Is State

eInfochips' Cloud Solution Architect engaged with the customer and worked to discover the current infrastructure, asset allocation policy and lifecycle management protocols as part of the assessment.

- Check vulnerabilities, customer privacy, policy adherence and industry compliances.
- Reliability and Performance study on data backup, disaster recovery and auto-scaling policies
- NOC/Cloud operation audit & SLA/KPI identification

3.3. Phase 2: Gap Analysis and Recommendation

eInfochips' team carried out a gap analysis and came up with best practice recommendations to configure the allocation of cloud resources that power applications, infrastructures, and workloads to maximize performance and minimize waste. The Cloud Solution Architect and Technical Lead provided a detailed Cloud Optimization Assessment Report at the end of this phase.

		Discover		Gap Analysis and Recommendation		
#	Pillars for Assessment	Current State	Current Metrics (2018)	To-be process	Recommendation	Metrics after Implementation (2021)
1	Cost Optimization Assessment	• Lack of visibility of Cost allocation against resource utilization • Lack of central approval process or budgetary allocation • Unutilized, over-provisioned resources	• 4M devices • 8 Product Variants • $700K cloud spend/month	• Instance right sizing and reservation • Clean up idle, underutilized resources • Custom optimization	• Tools implementation - CloudHealth, DynamoDB auto scaling • Cost optimization Strategy implementation • Cleaned up unused resources (EC2 snapshots, S3 logs, EIPs, ELB, etc.)	• 22M Devices • 15+ Product Variants • $2.5M Cloud Spend/Month (not increased linearly as the number of devices increased 3-fold) • 6M+ Registered Users • 1M+ Paid Subscribers
2	Security Audit	• No centralized Infrastructure or Application Security Audit • Lack of awareness of Security Best Practices • Ingress Protection missing	• High number of security-related incidents	• Threat detection • Standard Security best practices • Advance Shield, • WAF for DDoS etc.	• Setup centralized security assessment process based on tools like Security Hub, Threatstack etc. • AWS Security Standards -SOC 1/ISAE 3402, SOC 2, PCI DSS Level 1, ISO 27001 • VA/PT implementation via Qualys • Advanced Shield for DDoS protection Anomaly detection with Splunk	• No P0 (critical) and P1 (high) open vulnerabilities
3	Reliability and Performance Study	• Lack of Application Monitoring, only infrastructure monitoring in place • Old services being used slowing down performance • Lack of AWS Standard Infrastructure Best Practices • No advanced architecture designs • Lack of Backup & Disaster recovery strategy	• No Auto-scaling • No DevOps Automation • Deployment Success: 95% • Rollbacks: <10% • Build Failure: <10% • Uptime: 95%	• Advanced Architectural Pattern • App Monitoring • CI/CD setup • DynamoDB cross-region Replication • HA setup for – SNS, Geo routing, CDN over ELB	• Implementation of AppDynamics on the SaaS platform • Analysis and implementation of new AWS services • Implemented High Availability for Critical Components • Microservices on ECS, Kubernetes Cluster Implementation • Define Backup and Monitoring Disaster recovery strategy policy,	• Self-serve CICD pipeline • Deployment Success: 99% • Rollbacks: <1% • Build Failure: <3% • Uptime: 99.95%

		Discover			Gap Analysis and Recommendation		
#	Pillars for Assessment	Current State	Current Metrics (2018)	To-be process	Recommendation	Metrics after Implementation (2021)
4	Operational Study	• Lack of incident management process • Manual Deployments • Lack of Industry Best Practices in SLA management and Reporting	• Incident Resolution: 85% • No data-driven RCA • No measure of Time to Acknowledge (TTA) • MTTA: <10mins • Prevention of Recurrence: 60-70%	• SLA/KPI management • Ticket management • Incident management • Infrastructure as code (IaC)	• Utilize JIRA, Service Catalogue, AWS Operations checklist • DevOps Automation • SOP for Production outages or other P1 issues	• Incident Resolution: 100% • Reduction in repetitive incidents: 30% • MTTA: <4 mins • Prevention of Recurrence: 95-100%

4. Benefits

As the customer scaled from 4M devices to 22M devices over 3 years, they were able to realize the below improvements in execution metrics against each pillar of assessment/implementation.

Pillar	Vulnerabilities
Cost Optimization	• Enabled 20% cost control with linear increase in # of devices • 90% effective resource utilization
Security	• No P0 (critical) and P1 (high) open vulnerabilities • Critical Alarms Missed/Prevented 0
Performance Efficiency	• <5ms response time from server to API • Deployment Success 99% • On-time Deployment 94% • Rollbacks: <1% • Build Failure: <3% • Infra auto-launch – time gain: 70%
Operational Excellence	• 99.995% Uptime • 100% incident resolution • Auto Vs Manual Alerting 100% • Reduction in repetitive incidents: 30% • Service Delivery Velocity: 96%
Reliability	• 99.9999% reliability • 0% data loss • MTTA: <4 mins • Prevention of Recurrence: 95-100%

About eInfochips

eInfochips, an Arrow company, is a leading global provider of product engineering and semiconductor design services. With over 500+ products developed and 40M+ deployments in 140 countries, eInfochips continues to fuel technological innovations in multiple verticals. The company's service offerings include digital transformation and connected IoT solutions across various cloud platforms, including AWS and Azure.

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