Cloud Migration Strategy for FreshlyGround Café

A comprehensive architecture proposal for migrating on-premises infrastructure to AWS Cloud services, designed to enhance operational efficiency and customer engagement through scalable cloud solutions.

Business Context and Objectives

The Challenge

FreshlyGround is a beloved local café experiencing operational limitations due to outdated on-premises systems. The lack of robust digital infrastructure restricts customer reach and operational scalability in today's competitive market.

Strategic Goals

- Improve operational efficiency through automation
- Enhance customer engagement via digital channels
- Provide seamless, scalable online experiences
- Enable data-driven business decisions

Cloud Architecture Overview

A layered approach combining compute, storage, database, and security services to create a resilient, scalable infrastructure.

Compute Layer

EC2 instances and Lambda functions for application hosting and serverless execution

Database Layer

RDS and DynamoDB for structured and NoSQL data storage

Storage Layer

S3 buckets and EBS volumes for static content and persistent storage

Security Layer

IAM and Cognito for access control and user authentication

Compute Services Architecture

Amazon EC2 (Elastic Compute Cloud)

Virtual servers providing scalable compute capacity for hosting web applications, backend systems, and menu management platforms.

Implementation Approach

- Separate EC2 instances for distinct application components
- Auto Scaling groups to handle traffic fluctuations
- Load balancing for high availability

AWS Lambda

Serverless computing for event-driven tasks, eliminating infrastructure management overhead whilst maintaining cost efficiency.

Use Cases

- Processing menu updates from S3 uploads
- Handling API Gateway requests
- Executing background data processing

Storage and Database Services

Amazon S3

Simple Storage Service hosts static website content including HTML, CSS, images, and multimedia assets. S3 buckets serve website assets directly with low latency and high durability.

- Static website hosting enabled
- Versioning for content protection
- CDN integration for global delivery

Amazon EBS

Elastic Block Store provides persistent block storage volumes for EC2 instances, ensuring data persistence across instance restarts and enabling database migration support.

- GP3 volumes for general purpose workloads
- Provisioned IOPS for database performance
- Snapshot-based backup capability

Amazon RDS

Relational Database Service manages structured data including menu items, orders, and transaction records with automated administration.

- Multi-AZ deployment for failover
- Automated backups and point-in-time recovery
- Database engine compatibility

Amazon DynamoDB

NoSQL database stores customer profiles, preferences, and session data with single-digit millisecond latency at scale.

- Serverless scaling for traffic spikes
- Flexible schema design
- Global tables for multi-region support

Security and Identity Management

AWS IAM (Identity and Access Management)

Centralised access control system implementing role-based security policies for all AWS resources, ensuring least-privilege access across the infrastructure.

Key Features

- Granular permissions for EC2 and Lambda
- Multi-factor authentication support
- Policy-based access control
- Audit trails with AWS CloudTrail

Amazon Cognito

User authentication and management service handling customer sign-up, sign-in, and access control with seamless integration into web and mobile applications.

Implementation

- User pool migration from existing systems
- Customisable authentication flows
- Integration with API Gateway

Migration Strategy and Tools

Structured approach using AWS migration services to ensure minimal downtime and data integrity during the transition from on-premises to cloud infrastructure.

Database Migration Service

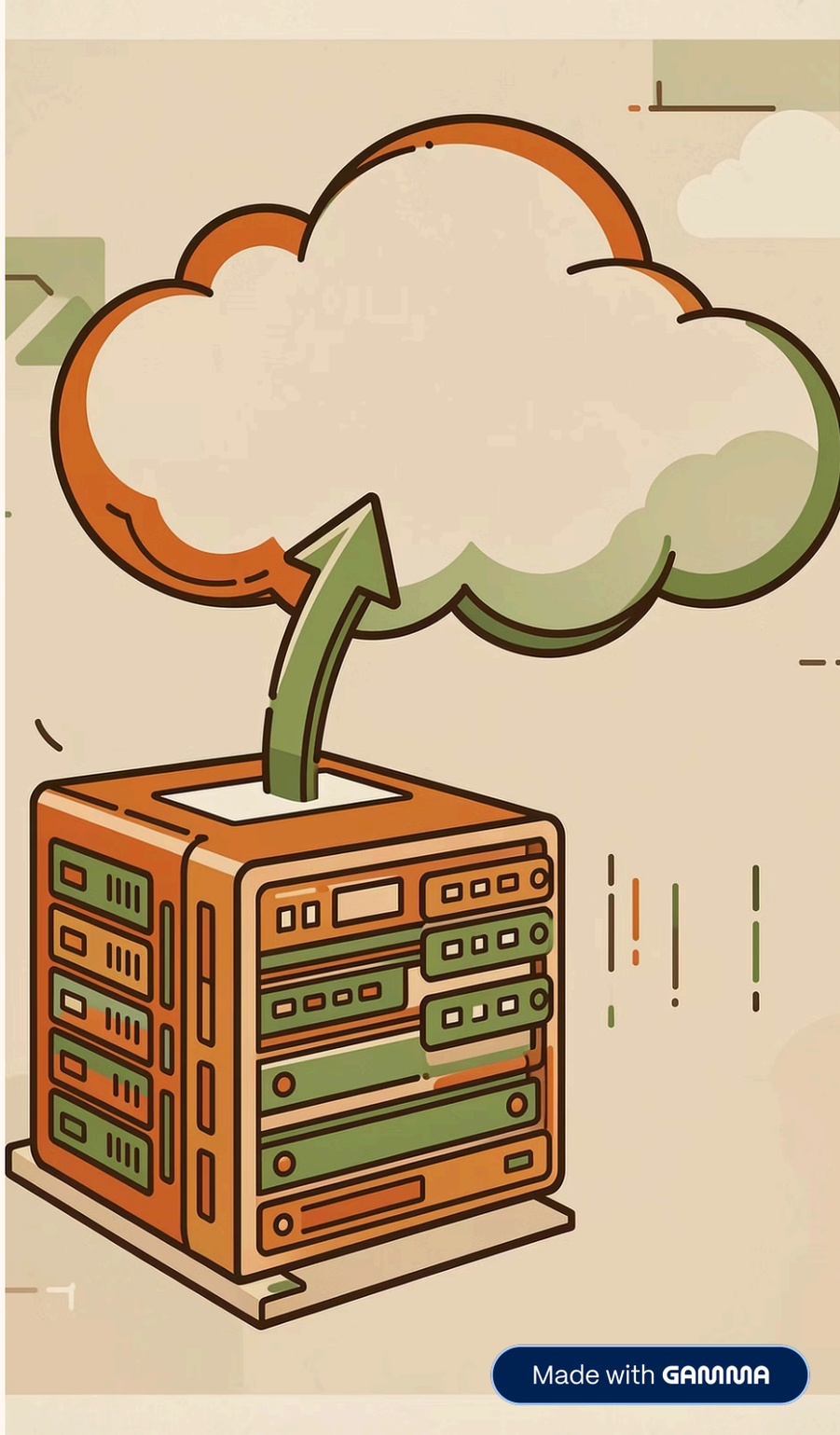
Continuous data replication with schema conversion for seamless database migration from on-premises systems to RDS and DynamoDB.

Server Migration Service

Automated replication of virtual machines to EC2 instances, enabling lift-and-shift migration of existing applications with minimal refactoring.

Validation & Testing

Comprehensive testing protocols ensuring data consistency, application functionality, and performance benchmarks before production cutover.



Cost Structure and Optimisation

1

Compute Costs

EC2 pricing based on instance type, vCPU, memory, and hourly usage with Reserved Instances offering 40-75% savings for predictable workloads. Lambda charges per request and execution duration with first 1 million requests free monthly.

2

Storage Costs

S3 charges based on storage size, number of requests, and data transfer out. EBS volumes priced by type (GP3, Provisioned IOPS) with snapshot costs based on stored data. Intelligent Tiering optimises costs automatically.

3

Database Costs

RDS pricing determined by instance type, allocated storage, and data transfer. DynamoDB charges based on read/write capacity units and storage with on-demand mode for unpredictable traffic patterns.

4

Security & Migration

IAM has no direct service charges. Cognito priced per monthly active user. DMS and SMS are free services with underlying EC2 infrastructure costs applying during migration execution.

Business Benefits Realised

Scalability & Flexibility

Handle peak traffic during busy periods without infrastructure constraints, scaling resources up or down based on demand

Cost Optimisation

Reduce capital expenditure on hardware whilst gaining operational efficiency through pay-as-you-go pricing models

High Availability

Multi-AZ deployments and automated failover ensure 99.95% uptime SLA for critical business operations

Enhanced Security

Enterprise-grade security with encryption at rest and in transit, compliance certifications, and granular access controls

Faster Time to Market

Rapid deployment of new features and digital services without hardware procurement delays

Digital Engagement

Seamless online ordering, loyalty programmes, and personalised customer experiences driving increased revenue

Conclusion: Why AWS Cloud

The AWS Cloud provides FreshlyGround with a comprehensive, enterprise-grade infrastructure that addresses current operational challenges whilst future-proofing growth. The combination of proven services, robust security, and flexible pricing creates a compelling business case for migration.

Key Advantages

- Proven reliability with 99.99% uptime across services
- Extensive service portfolio for complete digital transformation
- Global infrastructure for potential international expansion
- Continuous innovation with quarterly service enhancements
- Comprehensive documentation and support options

This architecture positions FreshlyGround for sustainable growth, operational excellence, and competitive advantage in the digital marketplace.