INFORMATION TECHNOLOGY UNIVERSITY

CAMPUSBITES

BS - Software Engineering

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Problem Statement:

University canteens typically operate using a manual, first-come-first-served ordering mechanism. During short academic breaks (15–30 minutes), this results in excessive congestion, long waiting times, and operational inefficiencies.

Objective:

The primary objective of the **CampusBites** project is to design and deploy a **scalable, secure, and highly available canteen pre-order system** using cloud-native technologies to eliminate congestion and inefficiencies in university food services.

Features

- Secure user authentication
- Real-time menu display
- Online pre-ordering
- Live order tracking
- Kitchen staff dashboard
- Auto scaling & high availability
- Secure cloud deployment

ARCHITECTURE DESCRIPTION

Web Tier (Public Subnet): React.js frontend on ECS Fargate, exposed via an internet-facing ALB for user access

Application Tier (Private Subnet): Node.js backend on ECS Fargate, accessed through an internal ALB for secure processing

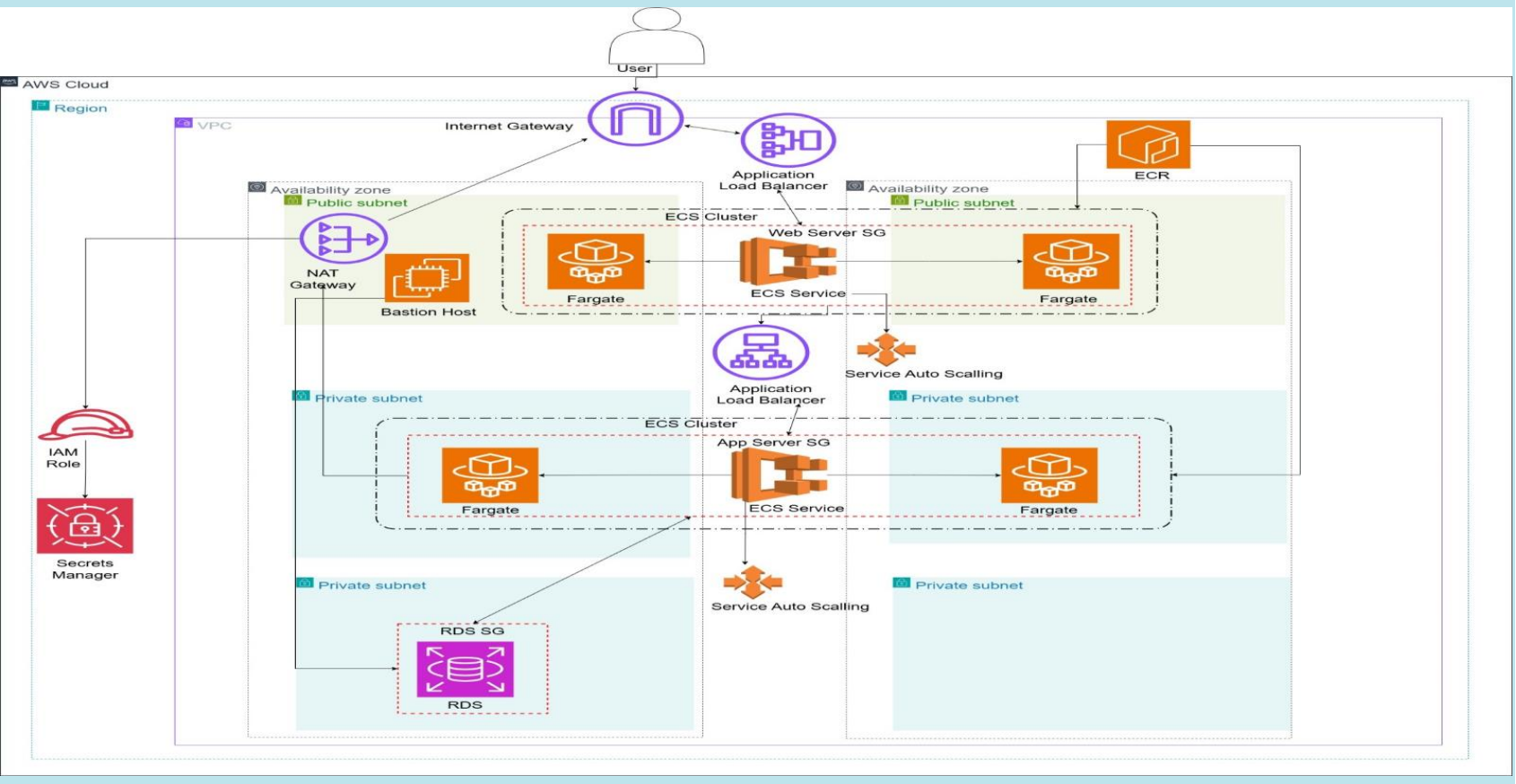
Data Tier (Private Subnet): Amazon RDS (PostgreSQL), isolated from public access to ensure data security

SECURITY & ADMINISTRATIVE ACCESS

Security is implemented using a **Defense-in-Depth** approach:

- Private subnets for application and database layers
- Security Group referencing instead of IP-based rules
- IAM roles assigned to ECS tasks for least-privilege access
- AWS Secrets Manager used for secure credential storage

Architecture Diagram



Tools Used:

commercetools, aws, GitHub, Visual Studio Code