AWS 8-Week Cloud Engineering Roadmap

Cloud Notes App – Infrastructure Deployment Project

This roadmap outlines the complete 8-week journey in cloud engineering — from foundational AWS setup to deploying a fully automated, scalable three-tier web application using CloudFormation, RDS, ALB, and Auto Scaling Groups. Each week introduces new services, builds on practical hands-on work, and culminates in a production-grade deployment.

Week 1 – IAM & S3 Foundations

• Created secure IAM users, groups, and billing alerts following the principle of least privilege.

• Enabled MFA, created admin and read-only roles, and configured programmatic access for CLI use.

• Configured S3 buckets for static website hosting, versioning, and encryption.

• Published a test HTML site on S3 and validated public access policies.

Week 2 – Networking Fundamentals

• Built a custom VPC with CIDR 10.0.0.0/16 and divided into public/private subnets.

• Added Internet Gateway and routing for public subnet access.

• Introduced NAT Gateway for secure outbound internet from private subnets.

• Explored route tables, CIDR blocks, and basic AWS networking principles.

Week 3 – Compute, Security Groups & NACLs

• Launched EC2 instances into both public and private subnets.

• Configured security groups for SSH, HTTP, and restricted DB access.

• Introduced Network ACLs for subnet-level inbound/outbound rule enforcement.

• Compared the functionality of Security Groups vs NACLs through testing.

Week 4 – Databases & Scaling

• Deployed a managed MySQL RDS database in private subnets with automatic backups and encryption.

• Connected EC2 web servers securely to RDS through internal endpoints.

• Configured Application Load Balancer (ALB) and Auto Scaling Group (ASG) for the web tier.

• Validated scaling and high availability using health checks.

Week 5 – Systems Integration & Monitoring

• Integrated ALB, ASG, and RDS within a unified network stack.

• Configured CloudWatch metrics, alarms, and SNS notifications for performance monitoring.

• Set up error logging for EC2 instances and load balancer access logs.

• Explored Lambda triggers for simple automation tasks.

Week 6 – Network Hardening & Observability

• Implemented Bastion Host in public subnet for secure SSH access to private resources.

• Enabled VPC Flow Logs and CloudTrail for network activity and audit logging.

• Enhanced ALB health checks and fine-tuned ASG scaling thresholds.

• Reviewed network security posture through NACL rules and CloudWatch metrics.

Week 7 – Infrastructure as Code (CloudFormation)

• Introduced CloudFormation concepts: stacks, templates, parameters, outputs, and dependencies.

• Created modular templates for VPC, subnets, security groups, and EC2 resources.

• Used !Ref, !Sub, !ImportValue, and nested stacks for template reusability.

• Deployed CI/CD pipeline with CodePipeline, CodeBuild, and CodeDeploy connected to GitHub repository.

Week 8 – Final Project: Cloud Notes App

• Developed Cloud Notes App using modular CloudFormation templates:

• • vpc-foundation.yaml – VPC with 2 public and 2 private subnets, route tables, and security groups.

• • web-tier.yaml – Application Load Balancer, Launch Template, and Auto Scaling Group for PHP web servers.

• • rds-tier.yaml – Private RDS MySQL database configured with DBSubnetGroup.

• Enabled CloudWatch monitoring for instance performance and cost tracking.

Final Deliverables

At the end of the 8-week roadmap, the following deliverables were completed:

■ Modular CloudFormation stacks: vpc-foundation.yaml, web-tier.yaml, rds-tier.yaml.

■ Fully deployed 3-tier application with public ALB, private RDS, and scalable EC2 instances.

■ CloudWatch metrics and alarms for health and cost visibility.

■ Architecture diagram and documentation for portfolio presentation.

■ GitHub repository containing code and templates for demonstration.