SWE-455: Cloud Application Engineering

Homework 01

Deploying a simple Cloud-based application

Ali Elmatarwy

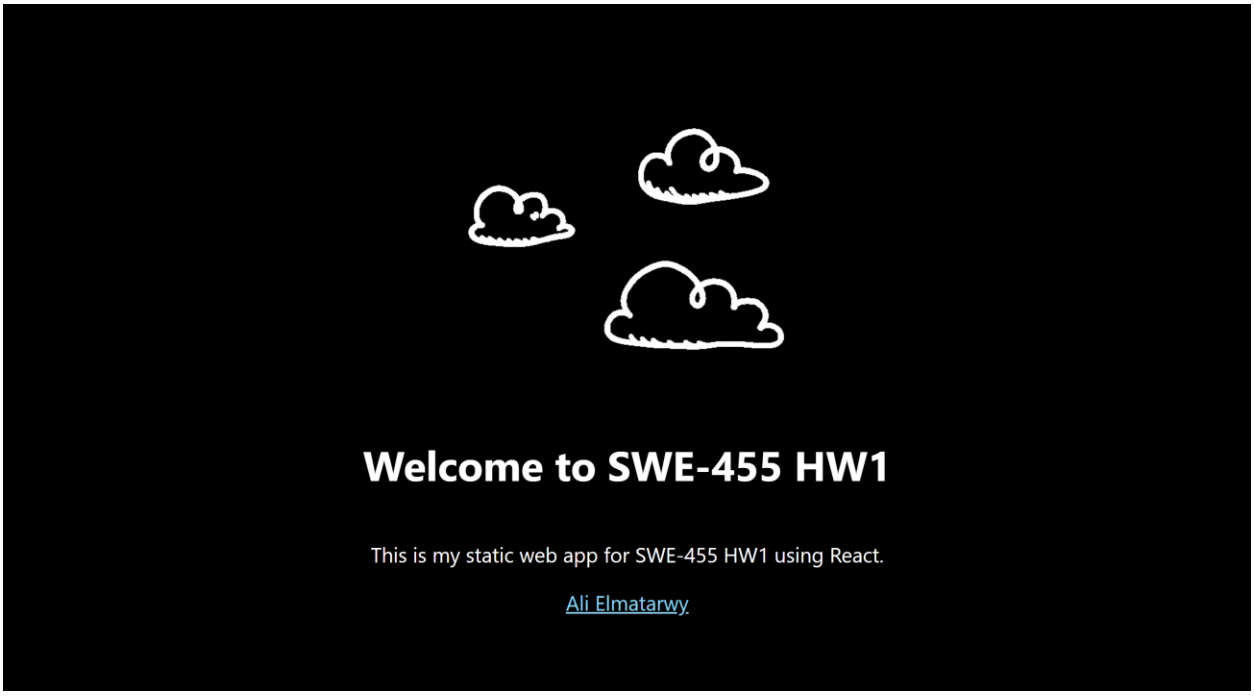
202045300

Task 1: Develop a sample application

For this assignment, I developed a simple web application using React. React was chosen because of its component-based architecture, ease of development, and strong community support. The application consists of a simple homepage displaying a welcome message.

Steps to Develop the Application:

1. Initializing React Project
    - Used npx create-react-app my-app to generate the project structure.
2. Develop the UI
    - Modified App.js to display a simple welcome page.
3. Test Locally
    - Ran npm start to ensure the application worked correctly before deployment.
4. Build the Project
    - Used npm run build to generate optimized static files for deployment.



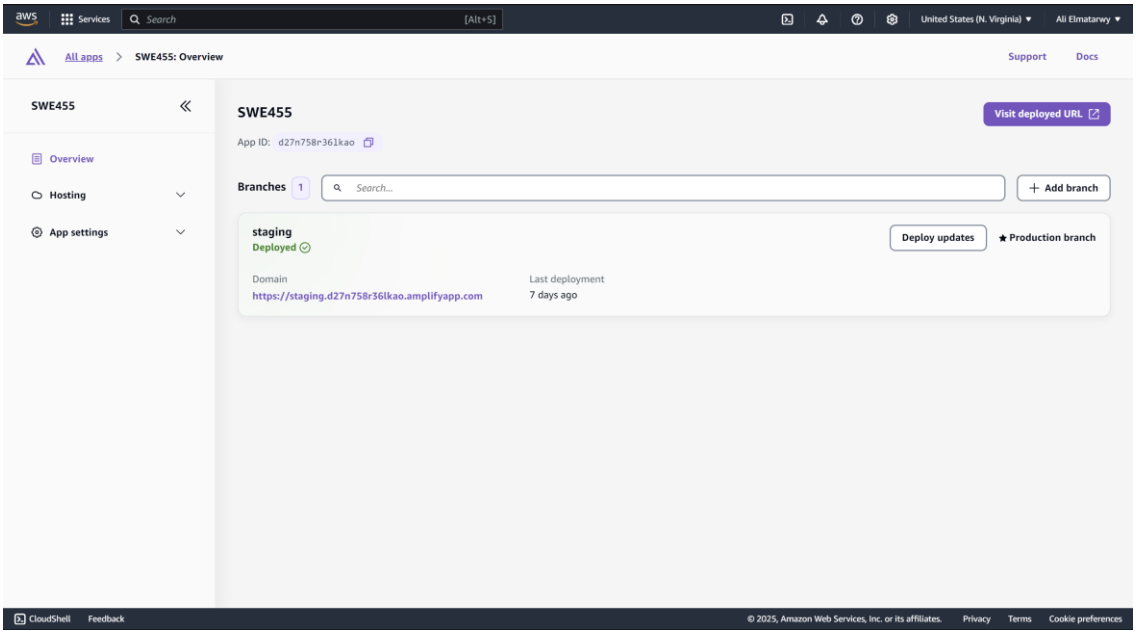
Task 2: Cloud deployment

The application was deployed using AWS Amplify, a cloud service that simplifies front-end deployment. Below are the steps I followed:

Steps to Deploy with AWS Amplify:

1. Create an AWS Amplify App
    - Logged into AWS and navigated to Amplify Console.
    - Clicked "New App" and selected "Host a web app."
2. Connect the Repository
    - Linked the GitHub repository containing my React application.
    - Configured build settings automatically detected by Amplify.
3. Deploying the Application
    - Used AWS's automated deployment pipeline to build and host the React app.
4. Public URL of the Deployed App:
    - Application Link

AWS Amplify Dashboard Showing Deployment:



Task 3: Scalability and Monitoring

To ensure scalability and monitoring, I configured AWS Amplify with the following:

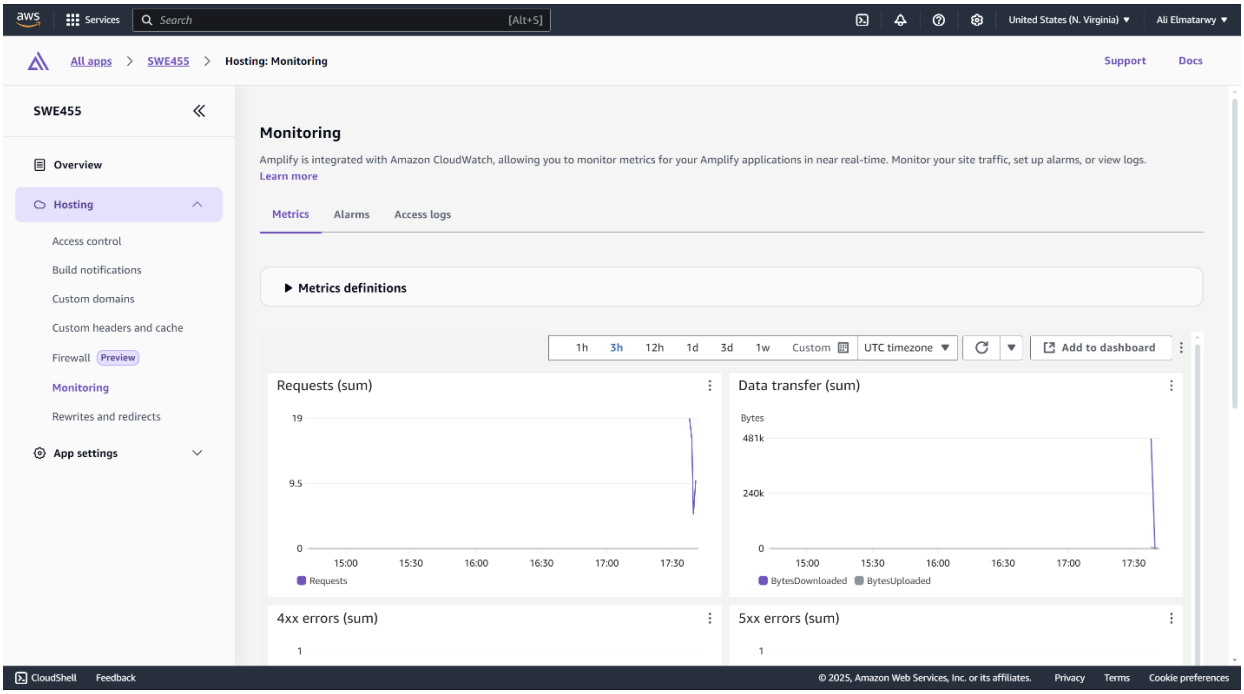
Scalability Setup:

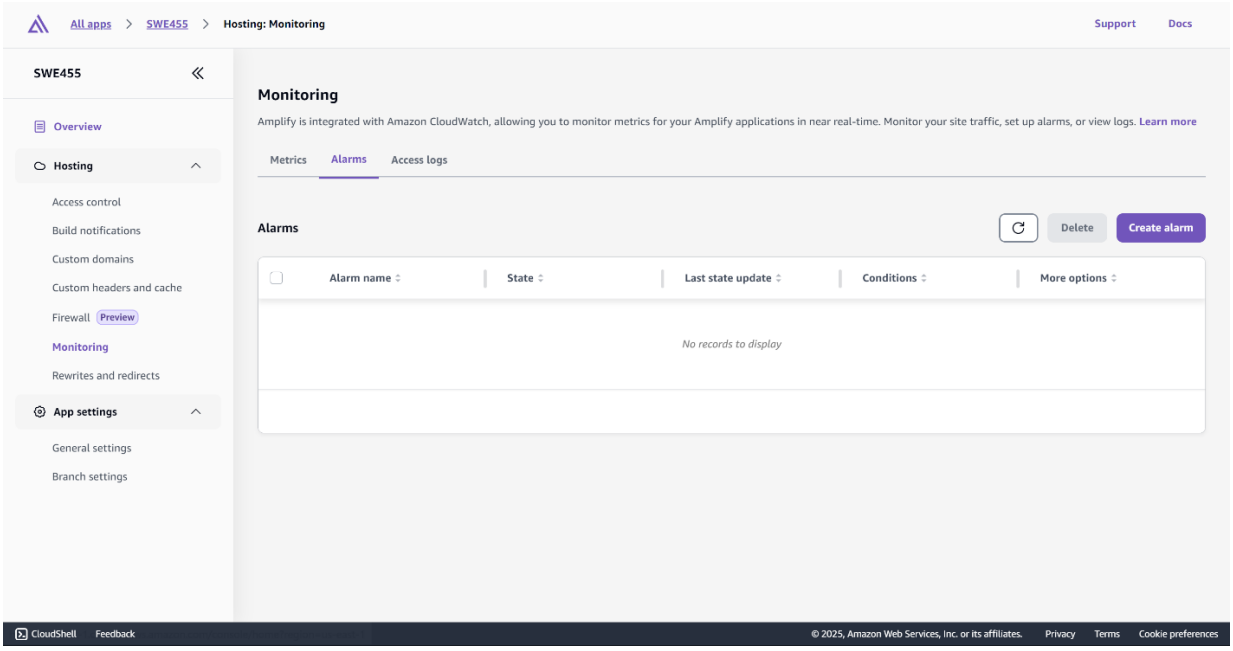
- AWS Amplify automatically scales based on traffic demands.
- The hosting service ensures multiple instances can handle traffic spikes.

Monitoring with AWS CloudWatch:

- Enabled AWS CloudWatch Monitoring to track application performance.
- Metrics Collected:
    - Deployment status
    - Build duration
    - Request count

Screenshot of AWS Amplify Monitoring Dashboard:

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Custom domains
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Monitoring
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Amplify is integrated with Amazon CloudWatch, allowing you to monitor metrics for your Amplify applications in near real-time. Monitor your site traffic, set up alarms, or view logs. Learn more
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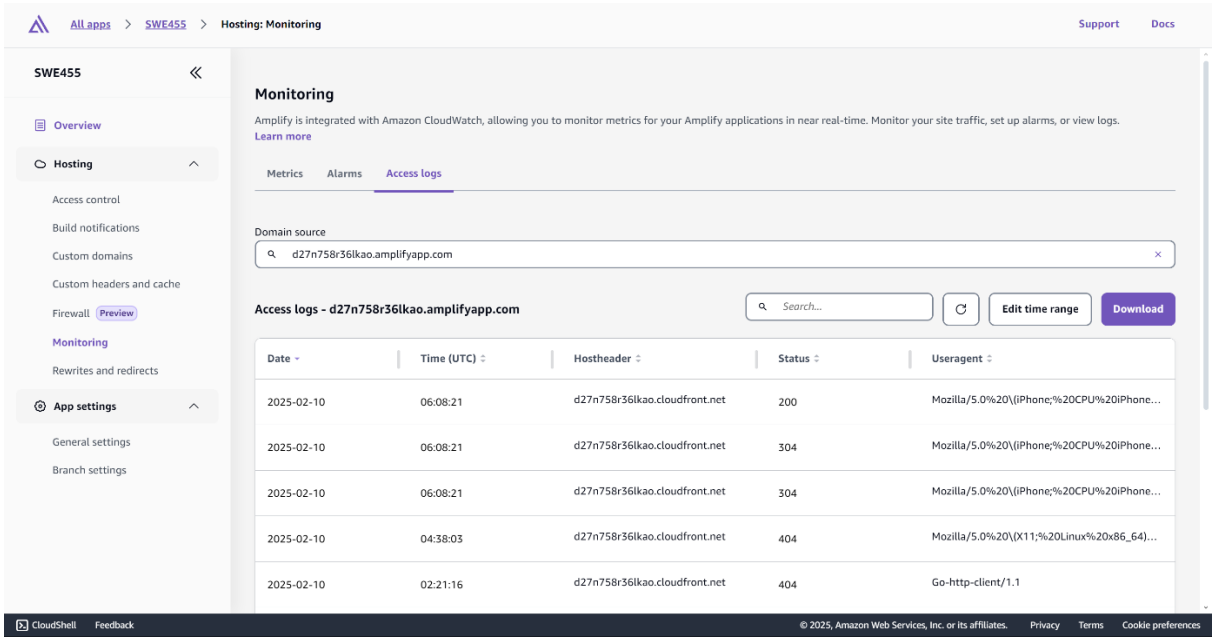
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2025-02-10 06:08:21 d27n758r36lkao.cloudfront.net 200 Mozilla/5.0%20\(iPhone;%20CPU%20iPhone...
2025-02-10 06:08:21 d27n758r36lkao.cloudfront.net 304 Mozilla/5.0%20\(iPhone;%20CPU%20iPhone...
2025-02-10 06:08:21 d27n758r36lkao.cloudfront.net 304 Mozilla/5.0%20\(iPhone;%20CPU%20iPhone...
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2025-02-10 02:21:16 d27n758r36lkao.cloudfront.net 404 Go-http-client/1.1
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Challenges Faced and Solutions:

1. Build Errors in AWS Amplify
    - Issue: Initially, the building failed due to missing dependencies.
    - Solution: Added missing dependencies in package.json and retried deployment.
2. Public Access Issue
    - Issue: The deployed app was not accessible due to incorrect AWS IAM settings.
    - Solution: Adjusted Amplify permissions to make the app publicly accessible.

Application Running in Browser: