README Template (AWS Security Monitoring Project)

Project Overview

This project demonstrates an **AWS-based Security Monitoring and Alerting System**. The system collects CloudTrail logs, analyzes them with Athena SQL, generates real-time alerts with EventBridge and SNS, and visualizes suspicious activities through a custom dashboard.

The solution is built entirely on **AWS native services**, without external SIEM tools.

Architecture

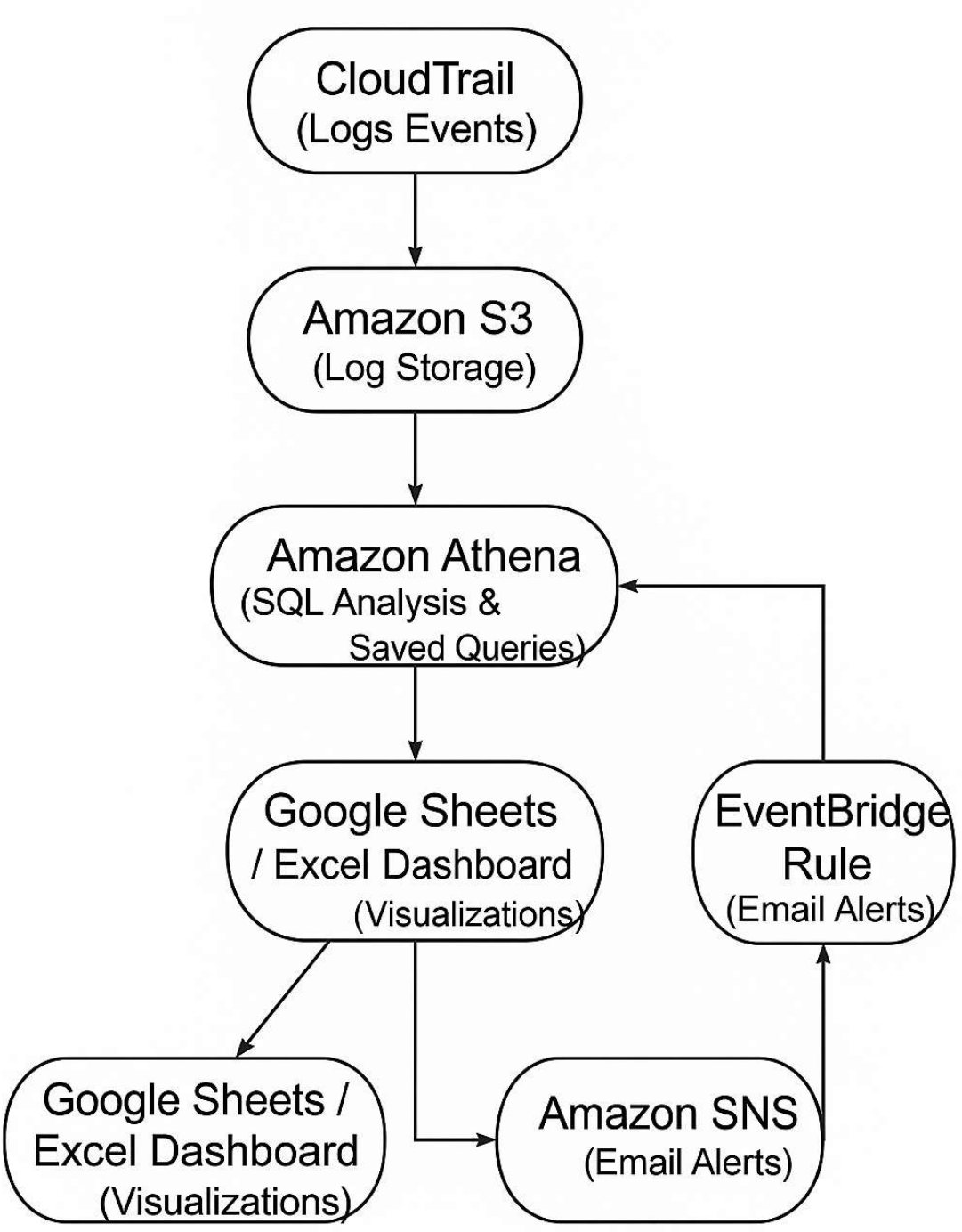
Features

- **Log Collection**
    - AWS CloudTrail logs stored in Amazon S3.
- **Analysis**
    - SQL queries on CloudTrail logs via Athena.
    - Partitioned by region/year/month/day for cost-efficient queries.
- **Detections Implemented**

1. Failed Console Login attempts
2. Top source IPs for failed logins
3. Abnormal KMS GenerateDataKey usage
4. Excessive S3 GetBucketAcl calls

- **Alerting**
    - EventBridge rule in **us-east-1** detects login events.
    - SNS topic delivers real-time email alerts.
- **Visualization**
    - Dashboard built in Google Sheets with 4 charts:
        - Failed logins per hour
        - Top 10 source IPs
        - KMS key usage per minute
        - S3 ACL reconnaissance per hour

- Architecture



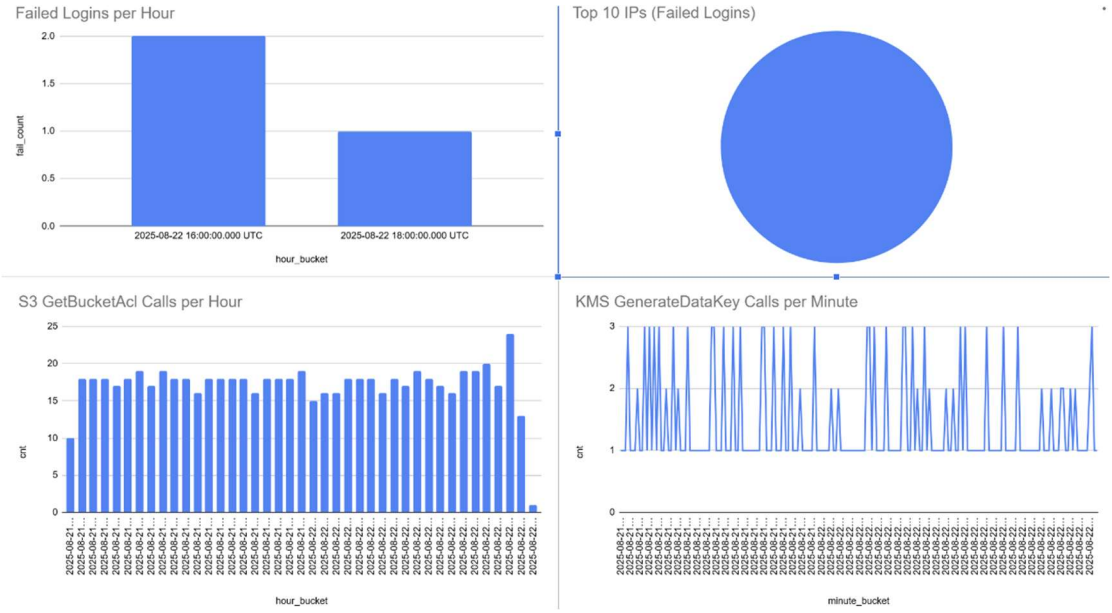
Example Queries (Athena SQL)

See file: Example_Queries

Dashboard

The dashboard consists of four visualizations:

1. **Failed Logins per Hour**
2. **Top 10 Source IPs**
3. **KMS GenerateDataKey Calls per Minute**
4. **S3 GetBucketAcl Calls per Hour**



Alerts

- EventBridge rule forwards login events to SNS.
- Example: Email received for failed ConsoleLogin attempt.


AWS Notification Message 收件箱 ×

AWS Notifications
发送至 我

15:11 (1小时前)

{"version":"0","id":"8c09eeb8-84e9-3ff0-46d3-1aa1ce835f79","detail-type":"AWS Console Sign In via CloudTrail","source":"aws.signin","account":"837098207926","time":"2025-08-22T18:11:15Z","region":"us-east-1","resources":[],"detail":{"eventVersion":"1.09","userIdentity":{"type":"Root","principalId":"837098207926","arn":"arn:aws:iam::837098207926:root","accountId":"837098207926","accessKeyId":""},"eventTime":"2025-08-22T18:11:15Z","eventSource":"signin.amazonaws.com","eventName":"ConsoleLogin","awsRegion":"global","sourceIPAddress":"24.138.75.160","userAgent":"Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/139.0.0.0 Safari/537.36","errorMessage":"Failed authentication","requestParameters":null,"responseElements":{"ConsoleLogin":"Failure"},"additionalEventData":{"LoginTo":"https://console.aws.amazon.com/console/home?hashArgs=%23&isauthcode=true&oauthStart=1755886199936&state=hashArgsFromTB_us-east-2_cac96d4f034d9230","MobileVersion":"No","MFAUsed":"Yes"},"eventID":"71fd9b75-715a-4b36-9536-dc54289a38a2","readOnly":false,"eventType":"AwsConsoleSignIn","managementEvent":true,"recipientAccountId":"837098207926","eventCategory":"Management","tlsDetails":{"tlsVersion":"TLSv1.3","cipherSuite":"TLS_AES_128_GCM_SHA256","clientProvidedHostHeader":"signin.aws.amazon.com"}}}

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Deliverables

- queries/ → SQL scripts for Athena.
- dashboard.png → Visualization screenshot.
- alert_email.png → Example SNS alert.
- architecture.png → System architecture diagram.

Resume Highlight

Built an AWS security monitoring PoC using CloudTrail, Athena, EventBridge, and SNS. Delivered real-time alerts for suspicious login activity and a dashboard visualizing login trends, KMS usage, and S3 reconnaissance attempts.