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IMPETUS

AWS & Impetus | GenAI Hackathon

AI Governance & Compliance

Multi-Agent AI Governance System

Sebastian Diaz Gaviria

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Introduction

Team of One: Sebastian Diaz Gaviria . Role: Full-Stack GenAI Developer & Architect.

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Problem statement

Generative AI, while powerful, presents significant risks: it can leak sensitive data, generate harmful content, and operate without a clear audit trail.

Businesses need a reliable way to enforce security, compliance, and ethical policies in real-time to mitigate these legal.

This project implements a real-time, multi-agent governance layer for a bilingual financial assistant chatbot, analyzing both user prompts and LLM-generated responses.

Solution approach

Solution details: We have developed an intelligent governance shield that intercepts and analyzes every interaction. Our system uses five specialized, autonomous agents that work in concert to apply a multi-layered defense and compliance strategy.

Key features:

- Five specialized agents: Prompt Guard, Policy Enforcer, Output Auditor, Advisory Agent, and Audit Logger.
- Fully bilingual UI (English/Spanish) with dynamic LLM responses.
- Role-Based Access Control (RBAC) simulation.
- User feedback mechanism and performance caching for optimization.

Scope of scaling: The serverless architecture (Lambda, Bedrock, DynamoDB) allows for seamless horizontal and vertical scaling to handle fluctuating loads without manual intervention.

Tech-stack selection

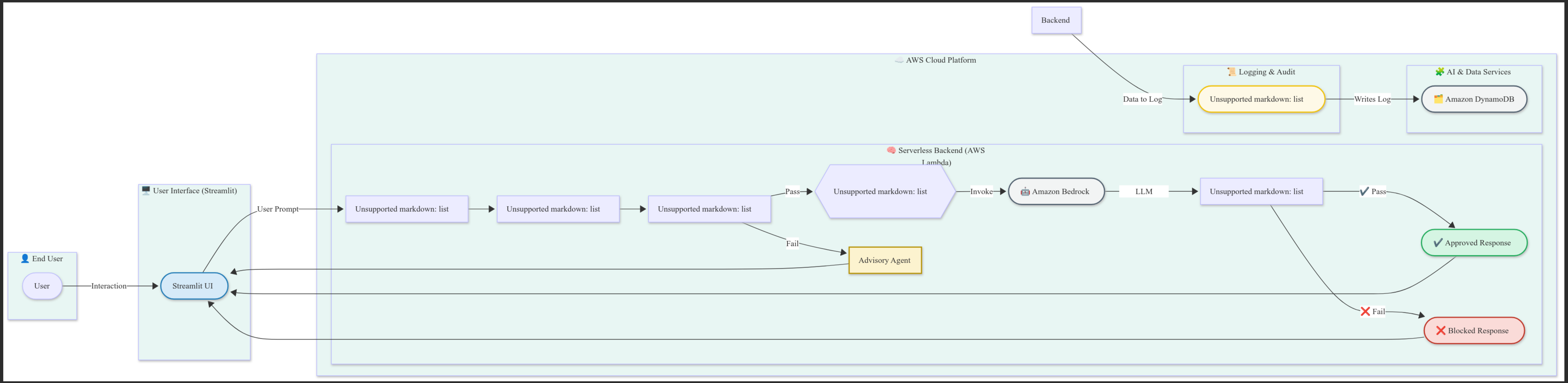
Selected model, language, framework: Cloude 3 Sonnet, Python, Streamlit

AWS services: Amazon Bedrock,Amazon Dynamo, AWS IAM

Give reasons for your tech stack selections :

- Streamlit was chosen for rapid, interactive UI development.
- Bedrock provides easy, scalable access to state-of-the-art foundation models.
- DynamoDB offers a highly scalable, low-latency, serverless database perfect for audit logs.

Architecture design/diagram



Cost estimates

Cost footprint: The chosen architecture is extremely cost-effective due to its serverless nature.

Hosting (Streamlit Cloud): $0 (Community Tier).

Database (DynamoDB): Effectively $0 for this scale, operating within the free tier.

The costs are minimal for a demonstration application (less than $10/month), for a considerable number of calls.

We are operating everything on the free tier of AWS.

Impact potential & limitations

Potential impact:

- Enables safe and responsible adoption of Generative AI across regulated industries.
- Reduces legal, financial, risks.
- Increases user trust and ensures compliance with regulations

Limitations of the current solution

- The governance ruleset is illustrative and would require expansion for a specific production environment.
- The Output Auditor's keyword-based check could be enhanced with a more sophisticated AI model for nuanced analysis.

Ethical & security considerations

Este proyecto está fundamentalmente diseñado para abordar problemas éticos y de seguridad. Por diseño, nuestro sistema:

- Prevents data leaks via the Policy Enforcer.
- Blocks harmful content with the Prompt Guard.
- Ensures transparency through the AI-powered Advisory Agent.
- Provides a full audit trail via the Audit Logger for accountability.

Project URL, video pitch & demo

<Include the hosted URL of the working project, if applicable>

<Include a short video (3 minutes) where you present your approach & architecture>

<This will help convey your solution approach and understanding of the project>

<Include a dry-run demo of the application>

<Include the link to your video (uploaded over a shareable drive)>

Thank you