Instructions

This document outlines a case study that will serve as the foundation for our discussion during your technical interview. Please come prepared to discuss your solution by bringing either a slide deck, or a document that details your approach.
The aim is to think clearly through your solution, and for us to take a collaborative approach to problem solving.

Problem Statement

You're an engineer at "BlockChain Solutions Inc.", a rapidly growing company specializing in blockchain technology. We host and maintain a variety of substrate based nodes and other types of stateful and stateless services and underpin our platform. To date, all infra has been located in a single AWS region, 'eu-west-1'.
As we expand our user base and strive for greeted reliability, we need to expand our footprint to a US region to maintain a good experience and ensure our systems are bulletproof.

Current Architecture

Some key aspects from our current layout:

- All infra is managed using Terraform. Our Terraform code resides in a single repository. While CI workflows are configured to run 'terraform plan' on changes, 'terraform apply' is executed manually by engineers.
- Workloads are containerized and deployed to Amazon EKS.
- For select critical services, we maintain both an active and a dormant instance. Both are kept in sync, but failover between them is a manual process.
- All source code is stored in Github, in a mix of public and private repositories.
- Our application deployment process uses Helm charts, stored within their respective code repositories. CI scripts are used to deploy these into EKS, providing minimal automation.
- Observability is handled via a Grafana stack.

The Task

We want to expand our infrastructure into US regions to enhance the production readiness of our services. As a Senior SRE, you are responsible for designing and implementing the necessary changes.
Some requirements that should be addressed:

- HTTP based services must be globally accessible
- Any architecture must be scalable to accommodate future expansion into additional regions
- The design must account for Disaster Recovery and ensure resilience against various failure scenarios.
- Given that this is our first expansion, we need to ensure infrastructure stability and consistency. This includes considering any tools or processes we should implement.
- Consider the implications of this expansion on supporting services, including networking, monitoring, cost, and SLOs/SLIs.
- Outline any trade-offs or potential concerns associated with your proposal.

Elaborate on how your proposed architecture will support these objectives, detail any special tools or processes you would introduce to ensure a smooth execution and ongoing stability.