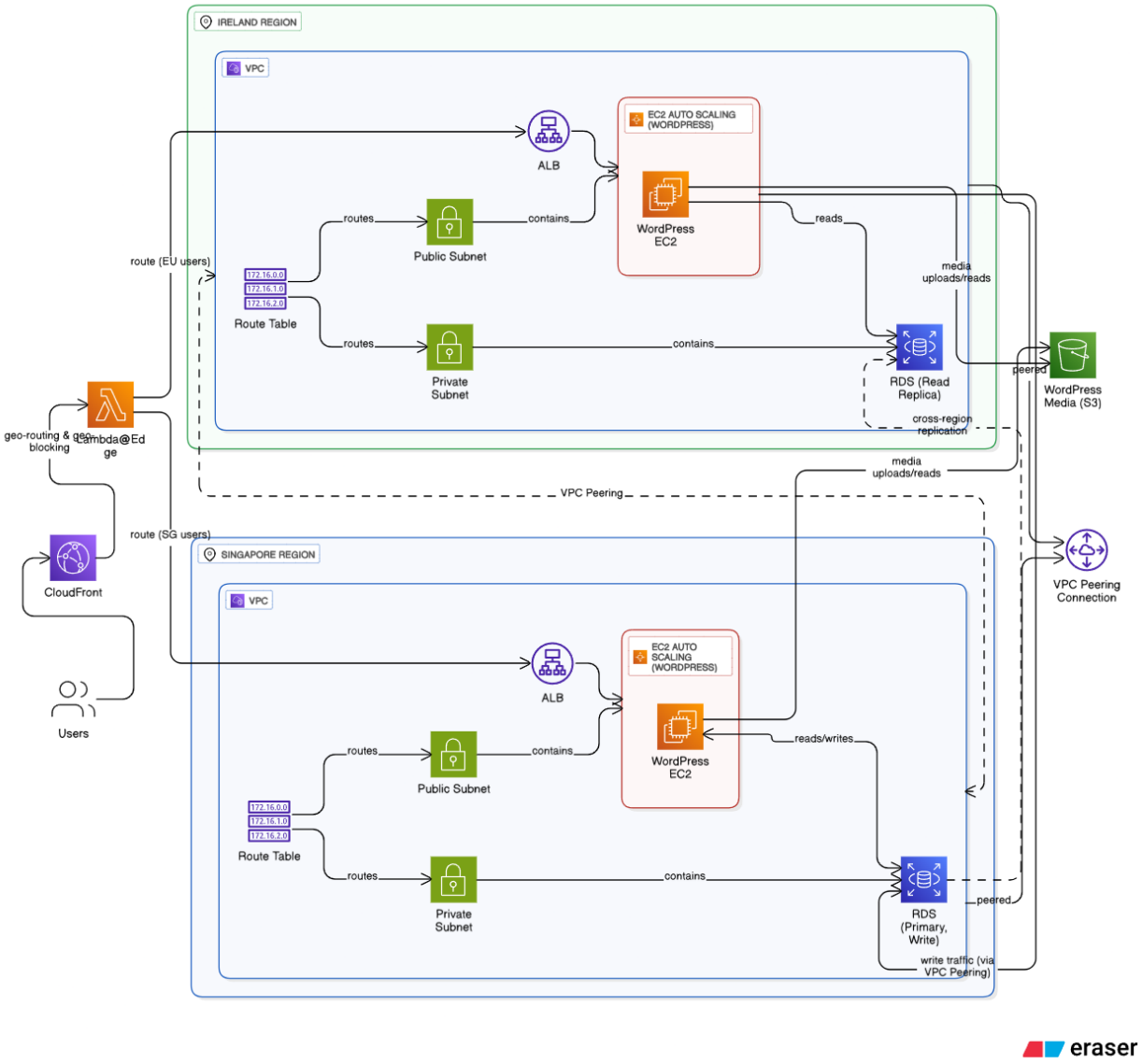
DevOps Task: Global WordPress Infrastructure on AWS

1. High-Level Architecture Diagram

The architecture employs a multi-region strategy with Singapore as the primary region and Ireland as the secondary.

1. **Core Components:**

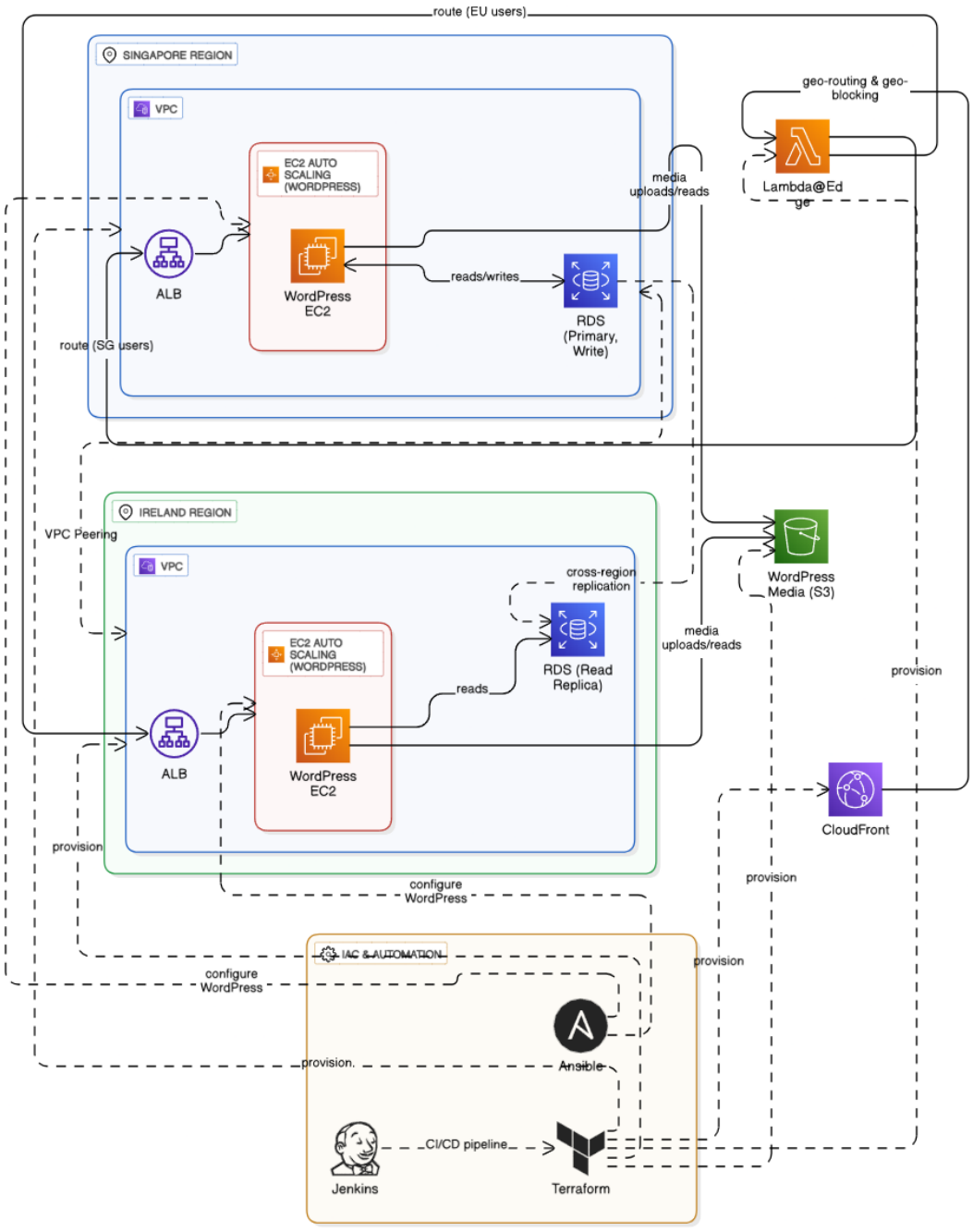
   Amazon CloudFront (CDN): Acts as the entry point for all user traffic. It caches static content globally and uses **Lambda@Edge** to route users to the nearest regional infrastructure (Singapore or Ireland). CloudFront also enforces **geographical restrictions**.
2. **Regional Infrastructure (Singapore & Ireland):**
   a. **VPC:** Each region has an isolated Virtual Private Cloud (VPC). The two VPCs are connected via **VPC Peering** to allow secure, private communication between them, primarily for cross region database write operations.
   b. **Application Load Balancer (ALB):** Distributes incoming traffic across the WordPress instances within its region.
   c. **EC2 Auto Scaling Groups:** Automatically adjusts the number of WordPress EC2 instances based on real-time traffic loads (CPU and memory utilization). This ensures performance during traffic spikes and cost-efficiency during quiet periods. It also ensures the application is highly available
   d. **Amazon RDS (MariaDB):** The primary, writable database is hosted in Singapore. A read-replica is maintained in Ireland to serve regional read requests with low latency. All write operations are directed to the primary database in Singapore.
   e. **IAM roles** are used to give the ec2 the ability to pull secrets and configs from parameter store and interact with S3 for uploads.
   f. **Parameter Store** is used to save user credentials and database credentials by creating string types and secretstring types of parameters respectively
3. **Amazon S3:** Used to offload and store all WordPress media files (images, videos), reducing the load on the EC2 instances and making WordPress stateless.



eraser

2. Pipeline and tools

- Jenkins is used to validate, plan and apply the terraform stack.
- Ansible and cloud-init are used to configure the ec2s (jenkins and wordpress).
    - Running ansible locally within the instance using cloud-init makes the ec2 configuration of the autoscaling groups simple and automatic
    - No need for a separate pipeline to configure ec2 instances
- S3 is used to store the terraform remote state and provide state locking.


route (EU users)
SINGAPORE REGION
VPC
EC2 AUTO SCALING (WORDPRESS)
ALB
WordPress EC2
reads/writes
RDS (Primary, Write)
route (SG users)
media uploads/reads
geo-routing & geo-blocking
Lambda@Edge
IRELAND REGION
VPC Peering
VPC
EC2 AUTO SCALING (WORDPRESS)
ALB
WordPress EC2
reads
RDS (Read Replica)
cross-region replication
WordPress Media (S3)
media uploads/reads
provision
CloudFront
provision
provision
configure WordPress
IAC & AUTOMATION
configure WordPress
Ansible
provision
Jenkins
CI/CD pipeline
Terraform