

Global Infrastructure

Application deployed in multiple geographies.
On AWS: Regions / Edge locations

Decreased latency:

Latency: Time taken for a network packet to reach a server

Disaster Recovery (DR): Availability of your application.

Attack Protection: Distributed global infrastructure is harder to attack.

Regions: For deploying applications & infrastructure

Availability zones: Multiple data centers.

Edge locations (Points of presence): For content delivery as close as possible to user.



Global applications in AWS

1)

Global DNS: Route 53.

Route to route users to the closest deployment with least latency.

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Great for DR strategies.

2)

Global Content Delivery Network (CDN): CloudFront

Replicate part of your application to AWS Edge locations

Decrease latency

Cache common requests - improved user experience and decreased latency.

3)

S3 Transfer Accelerator:

Accelerate global uploads & downloads into Amazon S3.

4)

AWS Global Accelerator:

Improve global application availability and performance

using the AWS Global network

Amazon Route 53

Manged Domain Name System (DNS)

Collection of rules and records which helps clients understand how to reach a server through URLs.

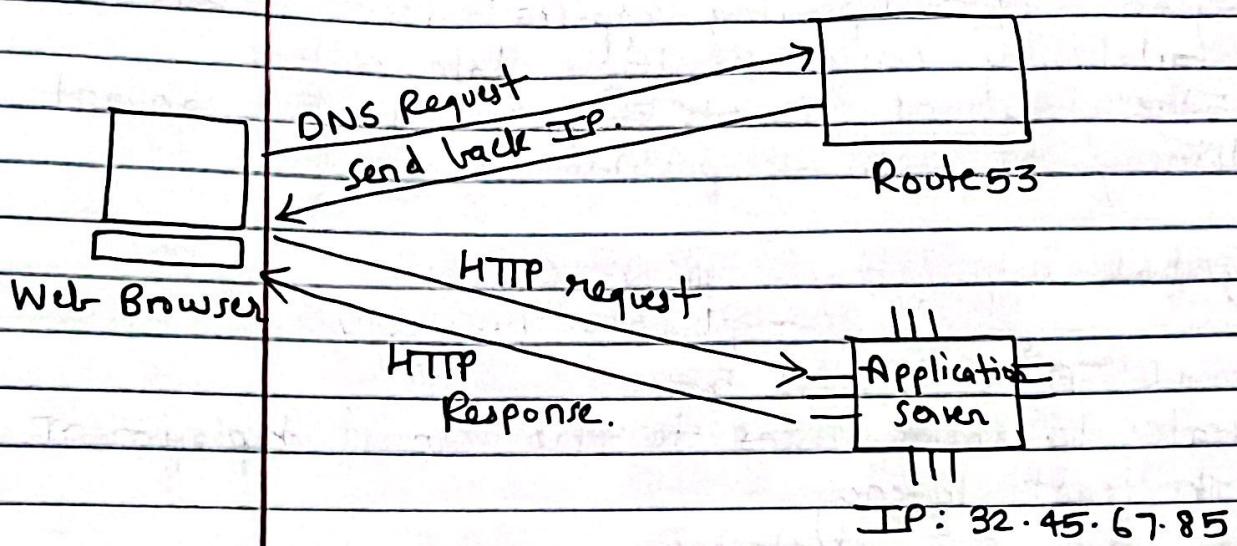
In AWS, the most common records are:

www.google.com : A record (IPv4)

www.google.com : AAAA (IPv6)

search.google.com \Rightarrow www.google.com == CNAME: hostname to hostname

example.com \Rightarrow AWS resource == alias (ex ELB, CloudFront, S3, RDS etc.).

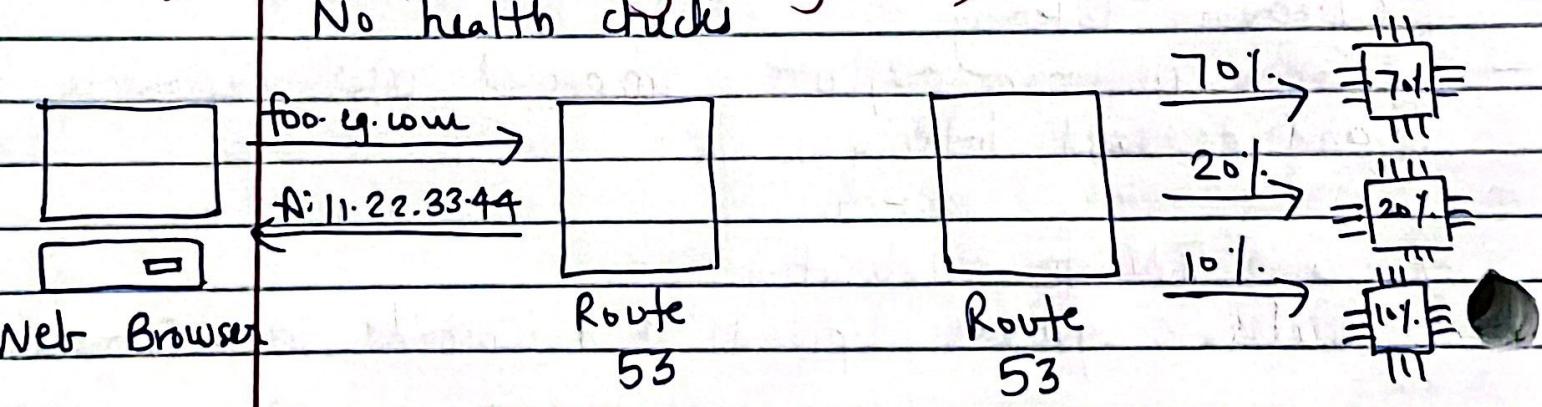


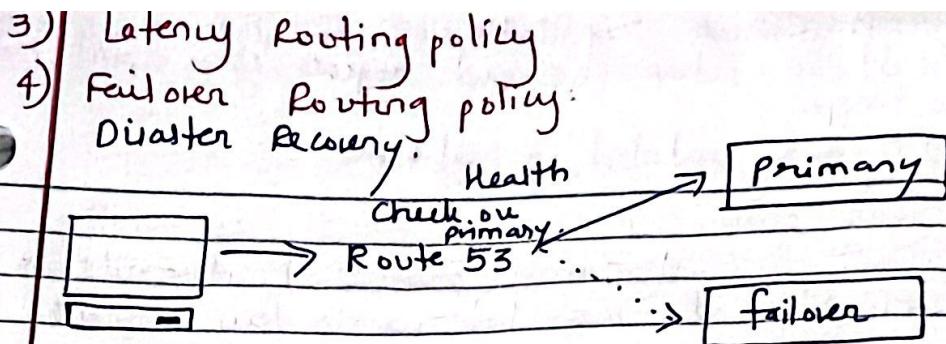
→ Routing Policy.

1) Simple Routing policy

No health checks

2) Weighted Routing Policy





AWS CloudFront

Content Delivery Network (CDN)

Improves read performance, content is cached at the edge.

Improves UX.

216 points of presence globally (edge locations).
 DDoS protection (because worldwide) ~~shielded~~ with Shield, AWS Web Application Firewall.

CloudFront - origins:

S3 bucket:

For distributing files and caching them at the end Enhanced security with CloudFront Origin Access Identity (OAI).

Used to ingress (to upload files to S3).

Custom origin (HTTP):

Application Load Balancer

EC2 instance

S3 website

Any HTTP backend you want.

CloudFront vs S3 Cross Region Replication.

CloudFront:

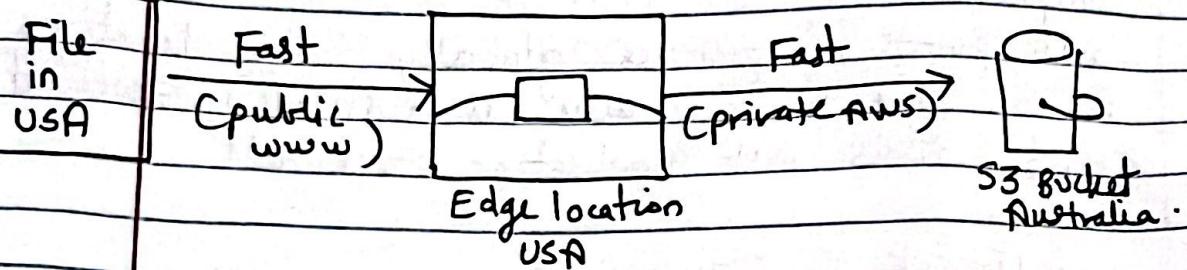
Global Edge Network

Files are cached for a ~~time~~
Static content

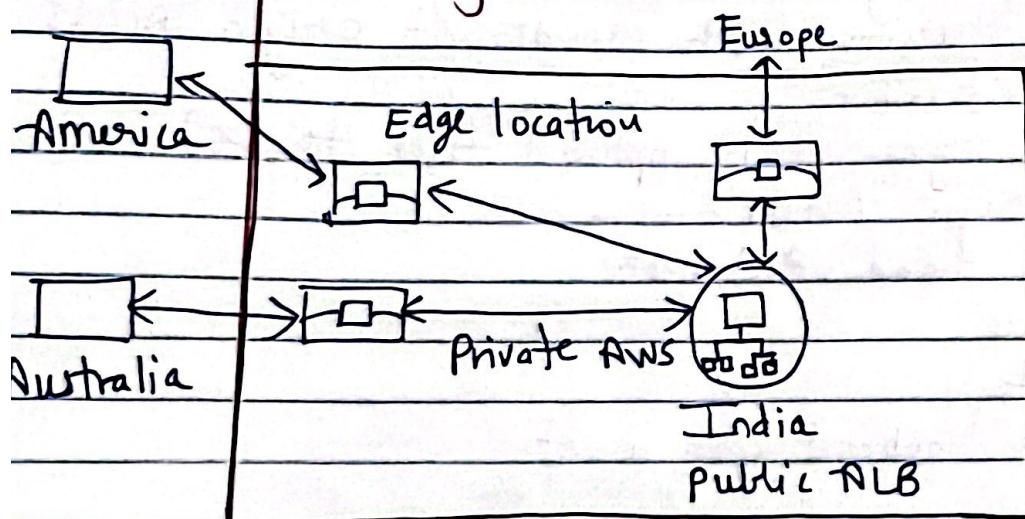
That must be available everywhere.

- S3 Cross Region replication:
Must be setup for each region you want replication to happen.
Files are updated in real-time
Read only
Great for dynamic content that needs to be available at low-latency in few regions.

→ S3 Transfer acceleration:
Improve transfer speed by transferring file to an AWS edge location which will forward the data to the S3 bucket in the target region.



* AWS Global Accelerator:



- Improve global application availability and performance using AWS global network
- Leverage the AWS internal network to optimize the route to your application (60% improvement)
- 2 Anycast IP created; traffic sent through Edge Locations
- Edge locations send the traffic to application.

Global Accelerator: Local ISP

Accelerator: Local ISP + AWS Network

→ AWS Global Accelerators vs CloudFront

Both use AWS Global network, edge locations
DDoS protection both have.

CON: Improve performance for your cacheable
network content (image, videos)
Content is served at the edge.

Global Accelerator: No caching, proxying packets,
improve performance over TCP, UDP, good for HTTP
use cases that require static IP address, deterministic
failover, fast regional failover

AWS Outposts

Hybrid Cloud: Businesses that keep an on-premises
infrastructure alongside a cloud infra.

Two ways of dealing with IT systems: One for the
AWS cloud (AWS console, CLI, AWS APIs), one
for their on-premises infra

AWS Outposts = Server racks.

Same AWS infra, services, APIs & tools to build your
own applications on-premises.

AWS will setup and manage - Outposts Racks.

You are responsible for the Outposts Rack physical
security.

Benefits:

Low latency access to on-premises systems

Local data processing

Data residency

Easier migration from on-premises to the cloud

Fully managed service

Some services that work on Outposts:

EC2, EBS, S3, EHS, ECS, RDS, EMR

AWS Wavelength.

Wavelength zone's are infrastructure deployments, embedded within the telecommunications providers' datacenter at the edge of 5G networks. Brings AWS services to the edge of the 5G network.

Eg: EC2, EBS, VPC

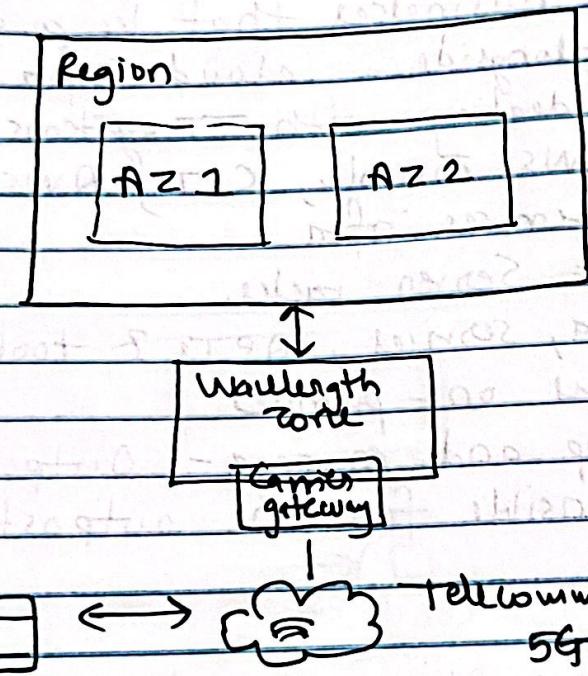
Ultra-low latency applies through 5G networks.

High bandwidth, secure connection.

Traffic doesn't leave communication service provider's (CSP) network.

No additional charges, service agreements.

We can: Smart cities, ML-assisted diagnostics, Connected vehicles, Interactive like video streams, AR/VR, Real-time gaming.



AWS Local Zones:

Places closer to end users to run latency-sensitive applications.

Compatible with EC2, RDS, ECS, EBS, Elasticache, Direct Connect.

Eg: AWS Region, AWS Local Zones.

Global Application in AWS - Summary *

Global DNS / Route 53

Create to route users to the closest deployment with least latency. Great for DR strategies.

Global Content Delivery Network (CDN): CloudFront
Replicate part of your application to AWS Edge locations - decrease latency. Cache common requests - improved UX and decreased latency.

S3 Transfer Acceleration:

Accelerate global uploads & downloads into Amazon S3

AWS Global Accelerator: Improve global application availability & performance using the AWS Global network

AWS Outposts:

Deploy Outposts Racks in your own Data Centers to extend AWS services.

AWS Wavelength:

Brings AWS services to the edge of the 5G network for ultra-low latency applications

AWS Local Zones:

Brings AWS resources (compute, storage, database..) closer to your users.

Good for latency-sensitive applications.