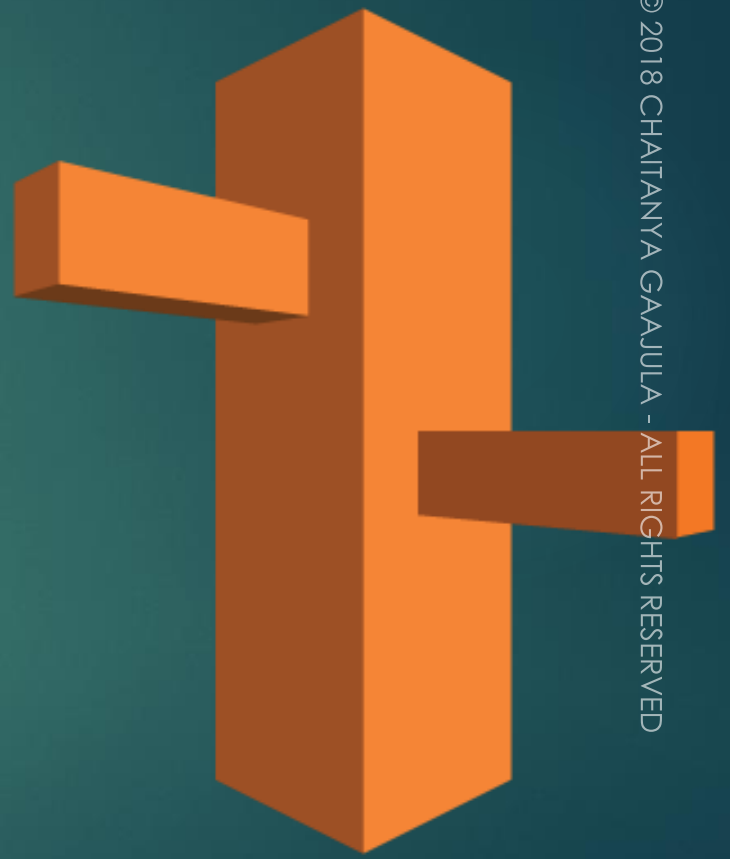
Route 53

Agenda

- What is Route53
- Route53 Concept
- Route53 Resource Record Types
- Route 53 Routes Traffic for Your Domain
- Route53 Functions
- Route53 Hosted Zone
- Route53 DNS Checking Tool
- Route53 Routing Policy
- Route53 Simple Routing Policy
- Route53 Failover Routing Policy
- Route53 Geo-Location Routing Policy
- Route53 Latency-based Routing Policy
- Route53 Weighted Routing Policy
- Route53 Geo-proximity Routing Policy
- Route53 Multi-value Answer Routing Policy
- Route53 Traffic Flow
- Route53 DNS Failover
- Route53 Limitations
- Route53 Summary
- Quiz
- Hands-On Lab



What is Route 53

- Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service.
- Like any DNS service, Route 53, is a globally distributed service that translates human readable names like www.example.com into the numeric IP addresses like 192.0.2.1 that computers use to connect to each other.
- Amazon Route 53 effectively connects user requests to infrastructure running in AWS – such as Amazon EC2 instances, Elastic Load Balancing load balancers, or Amazon S3 buckets – and can also be used to route users to infrastructure outside of AWS.
- You can use Amazon Route 53 to configure DNS health checks to route traffic to healthy endpoints or to independently monitor the health of your application and its endpoints.
- Route 53 is a pay-as-you-go service. You will be charged for the number of hosted zones you create and maintain and the number of DNS queries that Amazon Route 53 answers.

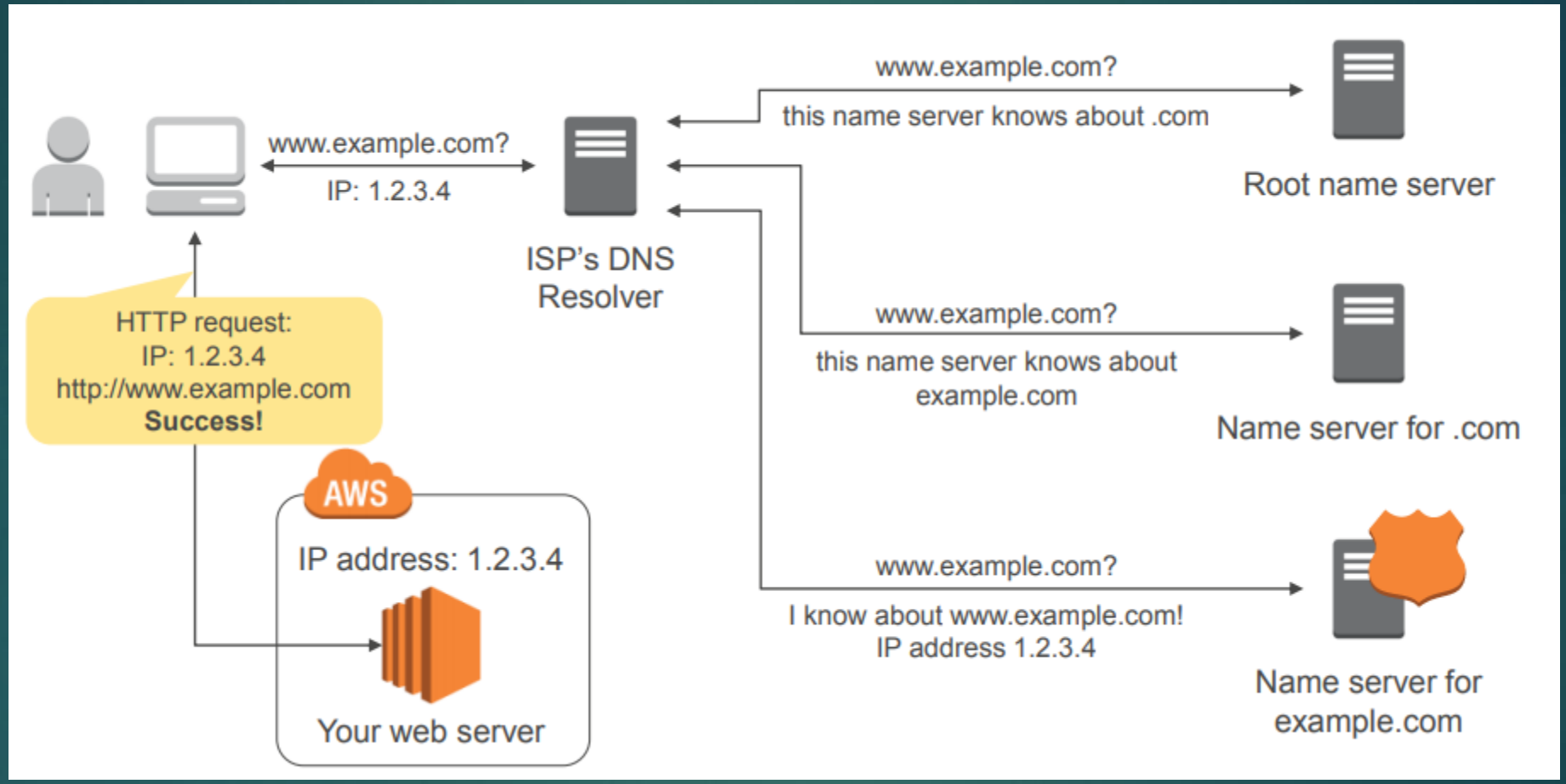
AWS Route53: Concept

- Resource Record Set
- Name Server
- DNS
- DNS Query
- DNS Resolver
- Hosted Zone
- IP Address
- Sub-Domain
- TTL

AWS Route53: Resource Record Types

- A Record
- CNAME Record
- MX Record
- TXT Record
- PTR Record
- SOA Record
- NS Record
- SRV Record

Amazon Route 53: Routes Traffic for Your Domain



AWS Route53: Functions

Amazon Route 53 performs three main functions:

- **Register domain names**
  - Your website needs a name, such as example.com.
  - Amazon Route 53 lets you register a name for your website or web application, known as a domain name.

- **Route internet traffic to the resources for your domain**
  - When a user opens a web browser and enters your domain name in the address bar, Amazon Route 53 helps the Domain Name System (DNS) connect the browser with your website or web application.

- **Check the health of your resources**
  - Amazon Route 53 sends automated requests over the internet to a resource, such as a web server, to verify that it's reachable, available, and functional.
  - You also can choose to receive notifications when a resource becomes unavailable and choose to route internet traffic away from unhealthy resources.

AWS Route53: Hosted Zone

- Amazon Route 53 stores information about your domain in the hosted zone.
- When you create a hosted zone, Amazon Route 53 automatically creates four name server (NS) records and a start of authority (SOA) record for the zone.
- The NS records identify the name servers that you give to your registrar or your DNS service so that queries are routed to Amazon Route 53 name servers
- You might have to wait a day or two before Amazon Route 53 becomes the DNS service for your domain name.
- AWS Route 53 has two types of hosted zone:
  - **Public Hosted Zone**
    - A public hosted zone is a container that holds information about how you want to route traffic on the internet for a domain, such as example.com, and its subdomains.
  - **Private Hosted Zone**
    - A private hosted zone is a container that holds information about how you want to route traffic for a domain and its subdomains within one or more Amazon Virtual Private Clouds (Amazon VPCs).

AWS Route53: DNS Checking Tool

- You can use the DNS checking tool in the console to see how Amazon Route 53 will respond to DNS queries.

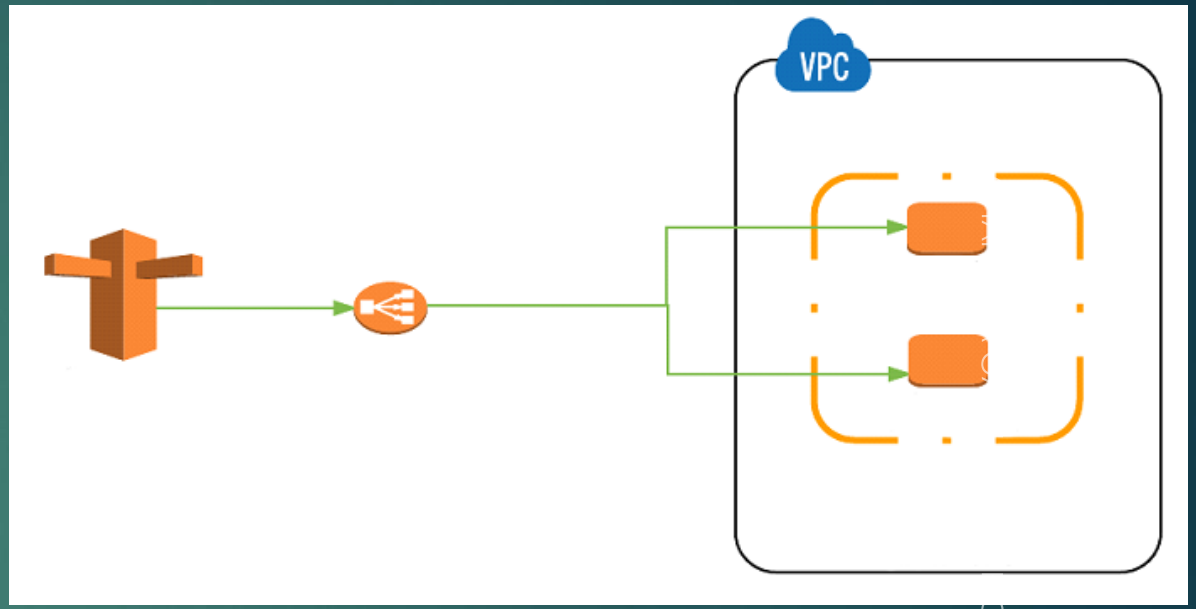
- The Response returned by Route 53 section includes the following values:
  - **DNS query sent to Route 53**
    - The values are typically the name of the resource record set, **IN** (for internet), and the type of the resource record set.
  - **DNS response code**
    - A code that indicates whether the query was valid or not. The most common response code is NOERROR, meaning that the query was valid. If the response is not valid, Amazon Route 53 returns a response code that explains why not.
  - **Protocol**
    - The protocol that Amazon Route 53 used to respond to the query, either UDP or TCP.

AWS Route53: Routing Policy

- Simple Routing Policy
- Failover Routing Policy
- Geo-Location Routing Policy
- Geo-proximity Routing Policy
- Latency-based Routing Policy
- Multi-value Answer Routing Policy
- Weighted Routing Policy

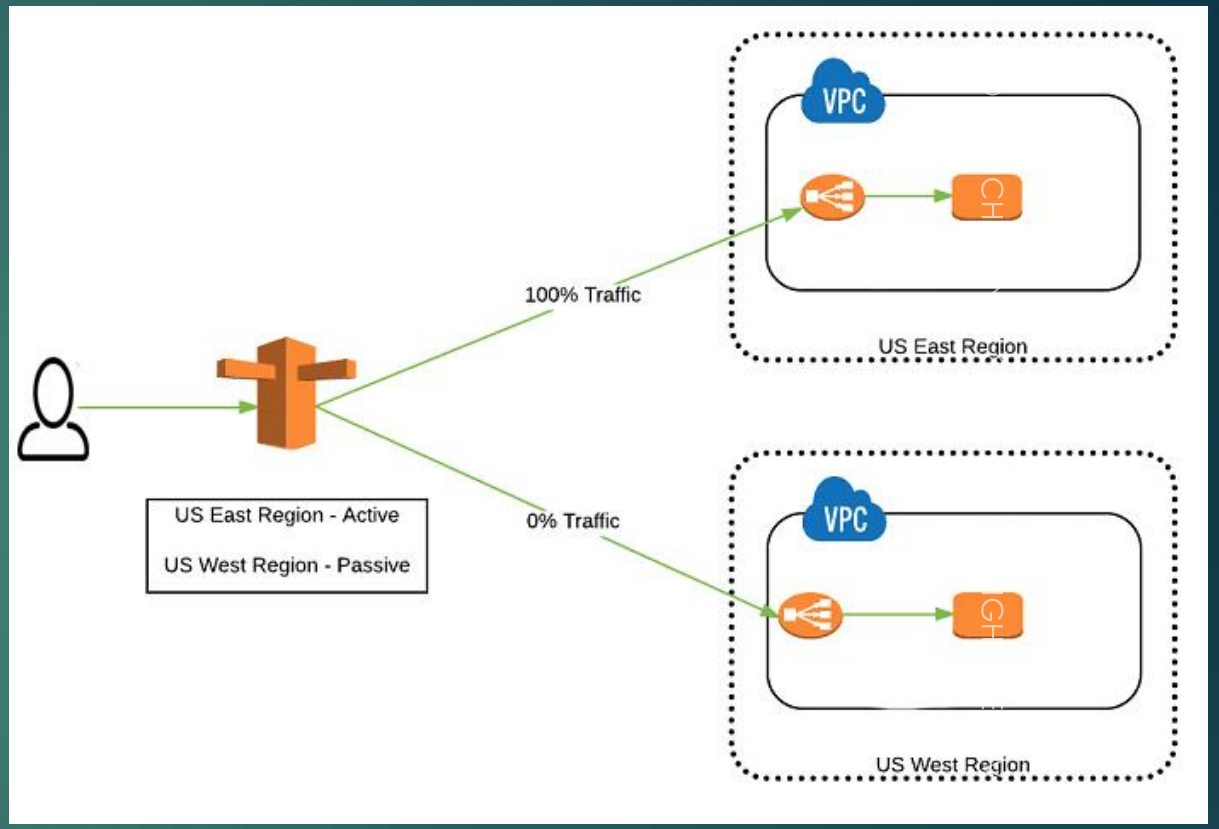
AWS Route53: Simple Routing Policy

- Simple Routing Policy is the most basic routing policy defined using an A record to resolve to a single resource.
- AWS Route 53 responds to the DNS queries based on the values in the resource record set for e.g. IP address in an A record.
- Simple routing policy is used only for a specific record like. In this way, our DNS query will resolve to only one IP/ Host like.
- For instance, a DNS record can be created to resolve the domain to an ALIAS record that routes the traffic to an ELB load balancing a set of EC2 instances.



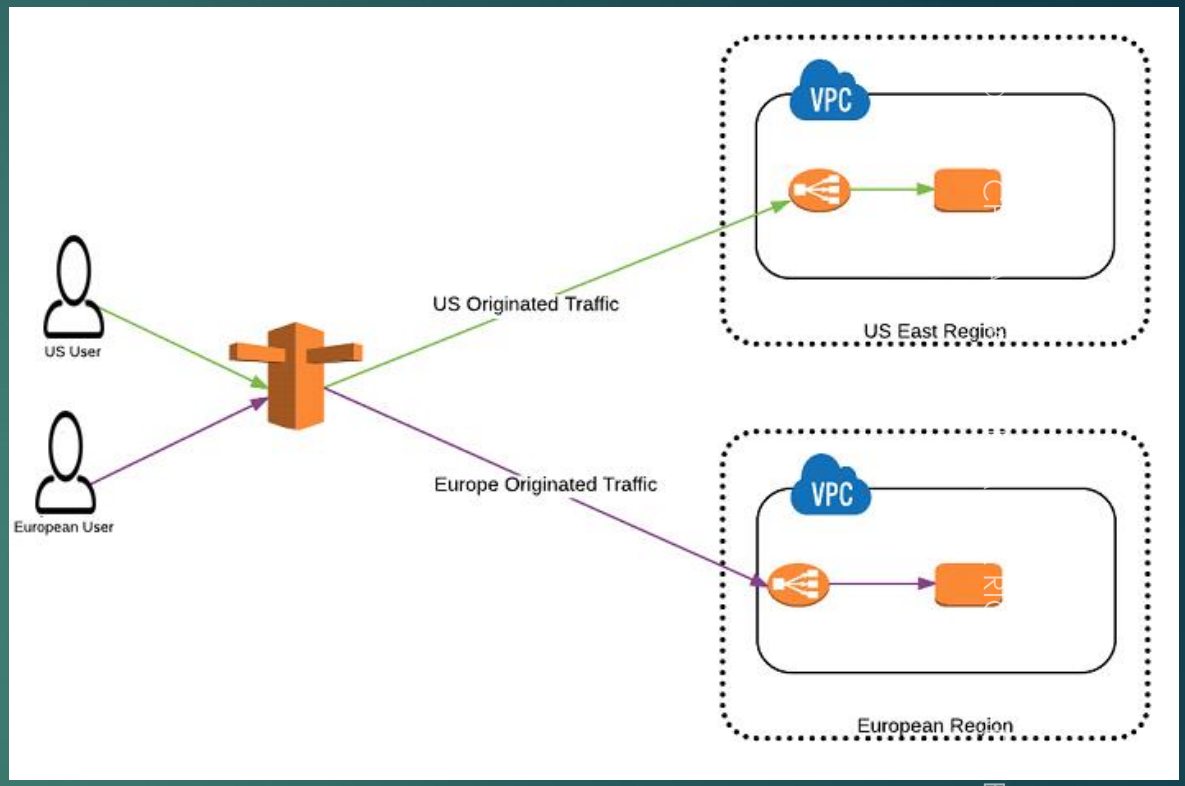
AWS Route53: Failover Routing Policy

- Failover routing lets you route traffic to a resource when the resource is healthy or to a different resource when the first resource is unhealthy.
- Failover Routing Policy is used to create Active/Passive set-up such that one of the site is active and serve all the traffic while the other site remains on the standby.
- Route 53 monitors the health of the primary site using the health check.
- When all of the resources that are referenced by the primary failover record are unhealthy, Amazon Route 53 automatically begins responding to queries by using the resources that are referenced by the secondary failover record



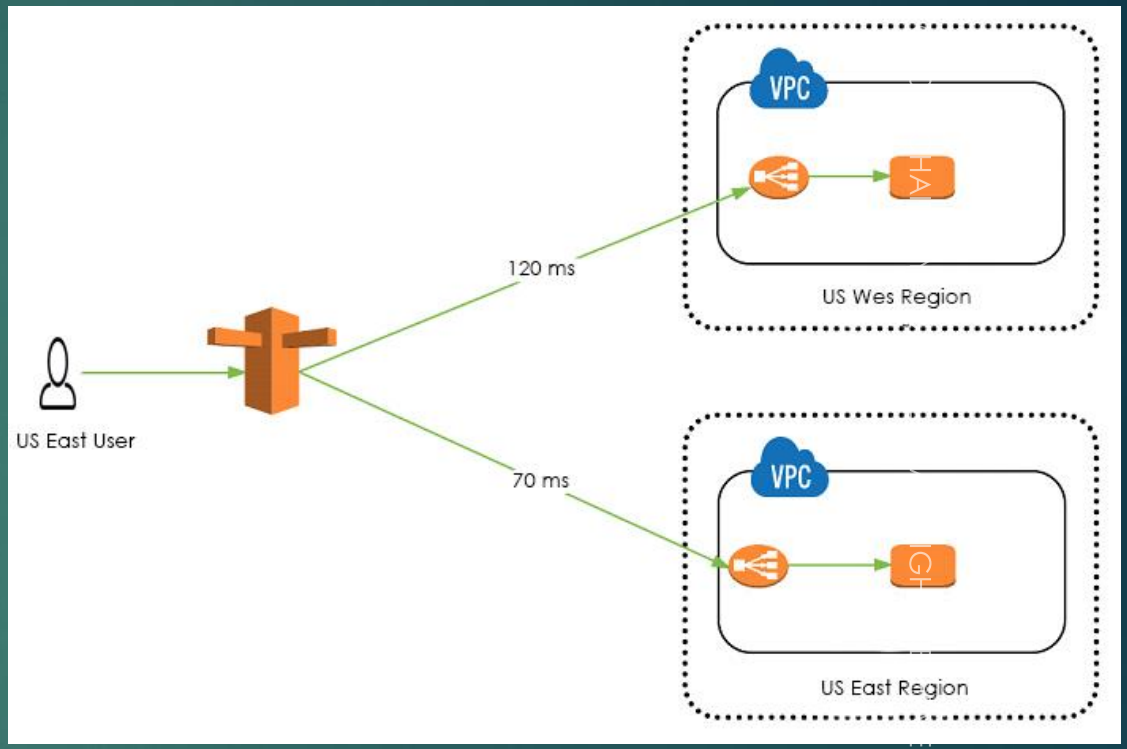
AWS Route53: Geolocation Routing Policy

- Geolocation Routing Policy is used to route the traffic based on the geographic location from where the DNS query is originated.
- This policy allows to send the traffic to resources in the same region from where the request was originated i.e. it allows to have site affinity based on the location of the users.
- For example, you might want all queries from Europe to be routed to an ELB load balancer in the Europe region.
- When you use geolocation routing, you can localize your content and present some or all of your website in the language of your users.



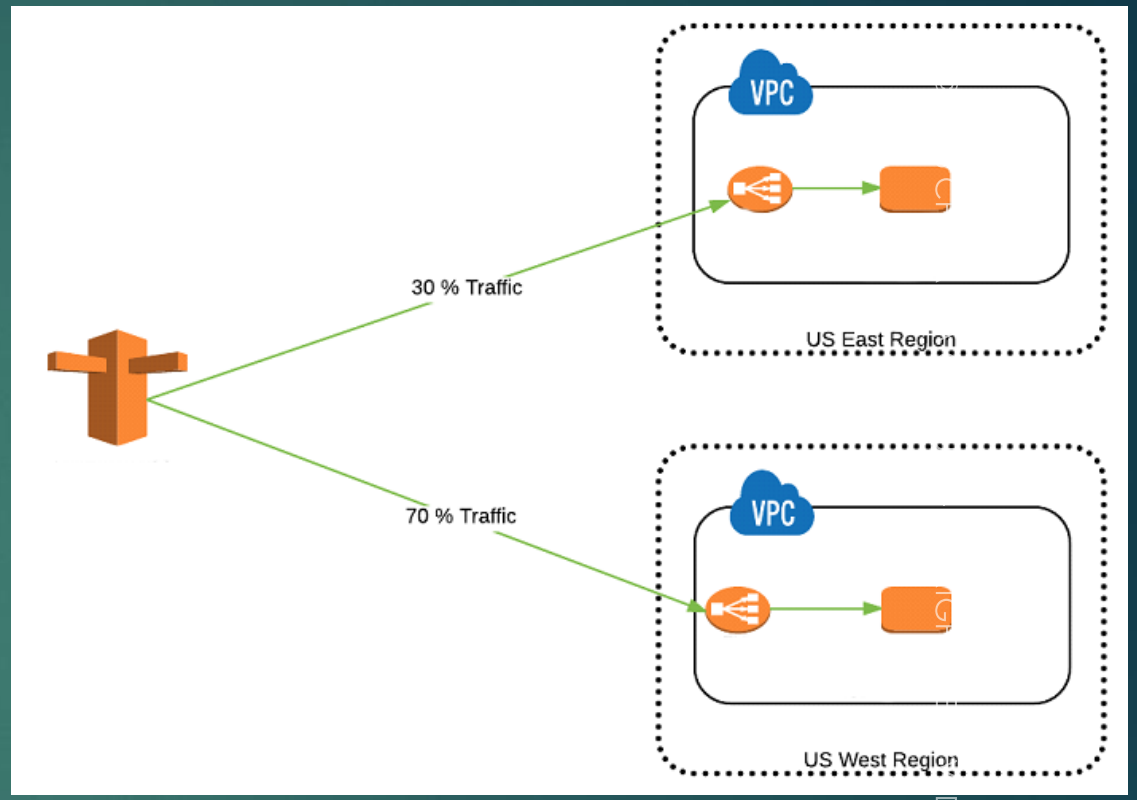
AWS Route53: Latency-based Routing Policy

- Latency Routing Policy is used when there are multiple resources for the same functionality and you want Route 53 to respond to DNS queries with answers that provide the best latency i.e. the region that will give the fastest response time.
- Example, you have ELB load balancers in the US West (Oregon) Region and in the US East (N. Virginia) Region. You created a latency record for each load balancer.
- Here's what happens when a user in US East (New York) enters the name of your domain in a browser:
  - If latency is lower between the New York and N. Virginia regions, Route 53 responds to the query with the IP address for the N. Virginia load balancer.
  - If latency is lower between New York and Oregon regions, Route 53 responds with the IP address for the Oregon load balancer Singapore.



AWS Route53: Weighted Routing Policy

- Weighted Routing Policy is used when there are multiple resources for the same functionality and the traffic needs to be split across the resources based on some predefined weights.
- This can be useful for a variety of purposes, including load balancing and testing new versions of software.
- Route 53 sends traffic to a resource based on the weight that you assign to the record as a proportion of the total weight for all records in the group.
- For example, if you want to send a tiny portion of your traffic to one resource and the rest to another resource.



AWS Route53: Geoproximity Routing Policy

- Geoproximity routing lets Amazon Route 53 route traffic to your resources based on the geographic location of your resources.
- You can also optionally choose to route more traffic or less to a given resource by specifying a value, known as a bias, that expands or shrinks the size of the geographic region from which traffic is routed to a resource.
- To use geoproximity routing, you must use Amazon Route 53 traffic flow.
- You create geoproximity rules for your resources and specify one of the following values for each rule:
  - If you're using AWS resources, the AWS Region that you created the resource in
  - If you're using non-AWS resources, the latitude and longitude of the resource
- To optionally expand the size of the geographic region from which Amazon Route 53 routes traffic to a resource, specify a positive integer from 1 to 99 for the bias.

AWS Route53: Geoproximity Routing Policy

- Geoproximity routing lets Amazon Route 53 route traffic to your resources based on the geographic location of your resources.
- You can also optionally choose to route more traffic or less to a given resource by specifying a value, known as a bias, that expands or shrinks the size of the geographic region from which traffic is routed to a resource.
- To use geoproximity routing, you must use Amazon Route 53 traffic flow.
- You create geoproximity rules for your resources and specify one of the following values for each rule:
  - If you're using AWS resources, the AWS Region that you created the resource in
  - If you're using non-AWS resources, the latitude and longitude of the resource
- To optionally expand the size of the geographic region from which Amazon Route 53 routes traffic to a resource, specify a positive integer from 1 to 99 for the bias.

AWS Route53: Multivalue Answer Routing

- Multivalue answer routing lets you configure Amazon Route 53 to return multiple values, such as IP addresses for your web servers, in response to DNS queries.

- If you want to route traffic approximately randomly to multiple resources, such as web servers, you can create one multivalve answer record for each resource and, optionally, associate an Amazon Route 53 health check with each record.

- Example, suppose you manage an HTTP web service with a dozen web servers that each have their own IP address.
  - No one web server could handle all of the traffic, but if you create a dozen multivalue answer records, Amazon Route 53 responds to DNS queries with up to eight healthy records in response to each DNS query.
  - Amazon Route 53 gives different answers to different DNS resolvers.
  - If a web server becomes unavailable after a resolver caches a response, client software can try another IP address in the response.

AWS Route53: Traffic Flow

- Amazon Route 53 Traffic Flow is a domain name system service that allows an Amazon Web Services customer to define how end-user traffic is routed to application endpoints through a visual interface

- Example, using the traffic flow visual editor, you can easily create a configuration in which
  - You use geolocation routing to route all users from one country to a single endpoint and then
  - Use latency routing to route all other users to AWS regions based on the latency between your users and those regions.
  - You might also use failover routing to route users to a primary ELB load balancer within each region when the load balancer is functioning or to a secondary load balancer when the primary load balancer is unhealthy or is offline for maintenance.

AWS Route53: DNS Failover

- When you have more than one resource performing the same—you can configure Amazon Route 53 to check the health of your resources and respond to DNS queries using only the healthy resources.

- You can set up a variety of failover configurations using Amazon Route 53 alias, weighted, latency, geolocation routing, and failover records:
  - **Active-Active Failover**
    - Use this failover configuration when you want all of your resources to be available
    - When a resource becomes unavailable, Route 53 stop including it when responding to queries.
  - **Active-Passive Failover**
    - Use this failover configuration when you want a primary group of resources to be available
    - You want a secondary group of resources to be on standby
    - If all of the primary resources are unhealthy, Amazon Route 53 begins to include only the healthy secondary resources in response to DNS queries.
  - **Active-Active-Passive and other Mixed Configurations**
    - You can combine alias and non-alias records to produce a variety of Amazon Route 53 behaviors.

AWS Route53: **Limitations**

Resource	Default Limit
Hosted zones per account	500
Domains per account	50
Resource record sets per hosted zone	10,000

Hands-On Lab

Thank You