Route 53

# What is Route 53

- Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service. It is designed to give developers and businesses an extremely reliable and cost effective way to route end users to Internet applications by translating 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 is fully compliant with IPv6 as well.

# What is Route 53

- 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.

- Amazon Route 53 also offers Domain Name Registration – you can purchase and manage domain names such as example.com and Amazon Route 53 will automatically configure DNS settings for your domains.

# Route 53 Hosted Zone



**Create Hosted Zone**

A hosted zone is a container that holds information about how you want to route traffic for a domain, such as example.com, and its subdomains.

**Domain Name:** internal.example.com

**Comment:** example private DNS zone

**Type:** Private Hosted Zone for Amazon VPC

A private hosted zone determines how traffic is routed within an Amazon VPC. Your resources are not accessible outside the VPC. You can use any domain name.

**VPC Id:** vpc-da886bb2

**Create**

- A hosted zone is an Amazon Route 53 concept. A hosted zone is analogous to a traditional DNS zone file; it represents a collection of records that can be managed together, belonging to a single parent domain name. All resource record sets within a hosted zone must have the hosted zone's domain name as a suffix.

# Route 53 Routing Policies

When you create a record, you choose a routing policy, which determines how Amazon Route 53 responds to queries:

- Simple routing policy – Use for a single resource that performs a given function for your domain, for example, a web server that serves content for the example.com website.

- Failover routing policy – Use when you want to configure active-passive failover.

- Geolocation routing policy – Use when you want to route traffic based on the location of your users.

- Geoproximity routing policy – Use when you want to route traffic based on the location of your resources and, optionally, shift traffic from resources in one location to resources in another.

- Latency routing policy – Use when you have resources in multiple AWS Regions and you want to route traffic to the region that provides the best latency.

- Multivalue answer routing policy – Use when you want Route 53 to respond to DNS queries with up to eight healthy records selected at random.

- Weighted routing policy – Use to route traffic to multiple resources in proportions that you specify.

# Simple Routing Policy

- Simple routing lets you configure standard DNS records, with no special Route 53 routing such as weighted or latency. With simple routing, you typically route traffic to a single resource, for example, to a web server for your website.

# 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. The primary and secondary records can route traffic to anything from an Amazon S3 bucket that is configured as a website to a complex tree of records.
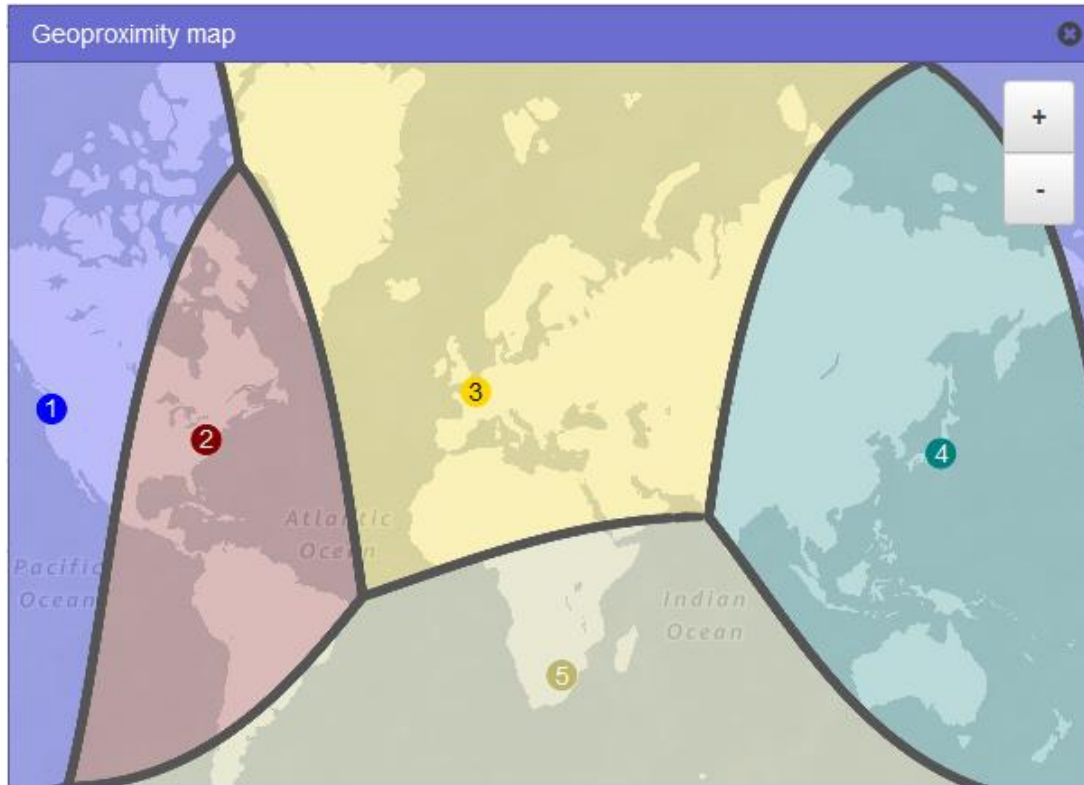
# Geolocation Routing Policy

- Geolocation routing lets you choose the resources that serve your traffic based on the geographic location of your users, meaning the location that DNS queries originate from. For example, you might want all queries from Europe to be routed to an ELB load balancer in the Frankfurt 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. You can also use geolocation routing to restrict distribution of content to only the locations in which you have distribution rights. Another possible use is for balancing load across endpoints in a predictable, easy-to-manage way, so that each user location is consistently routed to the same endpoint.

# Geo Proximity Routing Policy

Geoproximity routing lets Amazon Route 53 route traffic to your resources based on the geographic location of your users and your resources.



The following map shows four AWS Regions (numbered 1 through 4) and a location in Johannesburg, South Africa that is specified by latitude and longitude (5).

# Latency Routing Policy

- If your application is hosted in multiple AWS Regions, you can improve performance for your users by serving their requests from the AWS Region that provides the lowest latency.

- To use latency-based routing, you create latency records for your resources in multiple AWS Regions. When Route 53 receives a DNS query for your domain or subdomain (example.com or acme.example.com), it determines which AWS Regions you've created latency records for, determines which region gives the user the lowest latency, and then selects a latency record for that region. Route 53 responds with the value from the selected record, such as the IP address for a web server.

# Latency Routing Policy Use Case

For example, suppose you have ELB load balancers in the US West (Oregon) Region and in the Asia Pacific (Singapore) Region. You created a latency record for each load balancer. Here's what happens when a user in London enters the name of your domain in a browser:

- DNS routes the query to a Route 53 name server.

- Route 53 refers to its data on latency between London and the Singapore region and between London and the Oregon region.

- If latency is lower between the London and Oregon regions, Route 53 responds to the query with the IP address for the Oregon load balancer. If latency is lower between London and the Singapore region, Route 53 responds with the IP address for the Singapore load balancer.

# Multi Value Answer Routing Policy

- 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. You can specify multiple values for almost any record, but multivalue answer routing also lets you check the health of each resource, so Route 53 returns only values for healthy resources. It's not a substitute for a load balancer, but the ability to return multiple health-checkable IP addresses is a way to use DNS to improve availability and load balancing.

# Weighted Routing Policy

- Weighted routing lets you associate multiple resources with a single domain name (example.com) or subdomain name (acme.example.com) and choose how much traffic is routed to each resource. This can be useful for a variety of purposes, including load balancing and testing new versions of software.

- For example, if you want to send a tiny portion of your traffic to one resource and the rest to another resource, you might specify weights of 1 and 255. The resource with a weight of 1 gets 1/256th of the traffic (1/1+255), and the other resource gets 255/256ths (255/1+255). You can gradually change the balance by changing the weights. If you want to stop sending traffic to a resource, you can change the weight for that record to 0.

$$\frac{\text{Weight for a specified record}}{\text{Sum of the weights for all records}}$$

# Route 53 Record Types

- A Record Type : The value for an A record is an IPv4 address in dotted decimal notation.

- AAAA Record Type : The value for a AAAA record is an IPv6 address in colon-separated hexadecimal format.

- CNAME Record Type : A CNAME Value element is the same format as a domain name. Amazon Route 53 also supports alias records, which allow you to route queries to AWS resources such as CloudFront distributions and Amazon S3 buckets.

- NS Record Type : An NS record identifies the name servers for the hosted zone. The value for an NS record is the domain name of a name server.

# Route 53 Record Types

- SOA Record Type : A start of authority (SOA) record provides information about a domain and the corresponding Amazon Route 53 hosted zone.

- TXT Record Type : A TXT record contains one or more strings that are enclosed in double quotation marks (").

Note : The NS and SOA record types are automatically provided when the user creates the hosted zone.