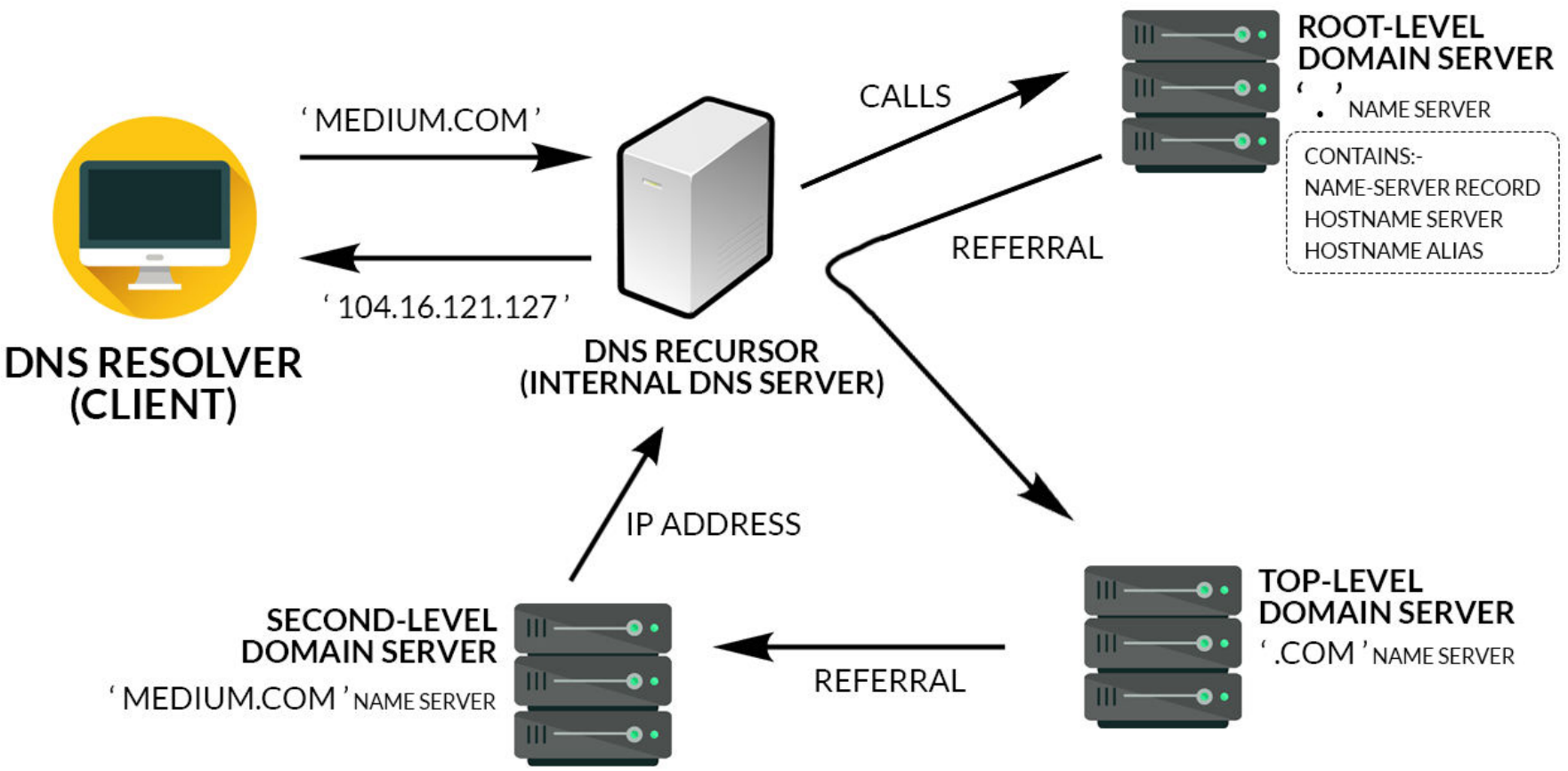
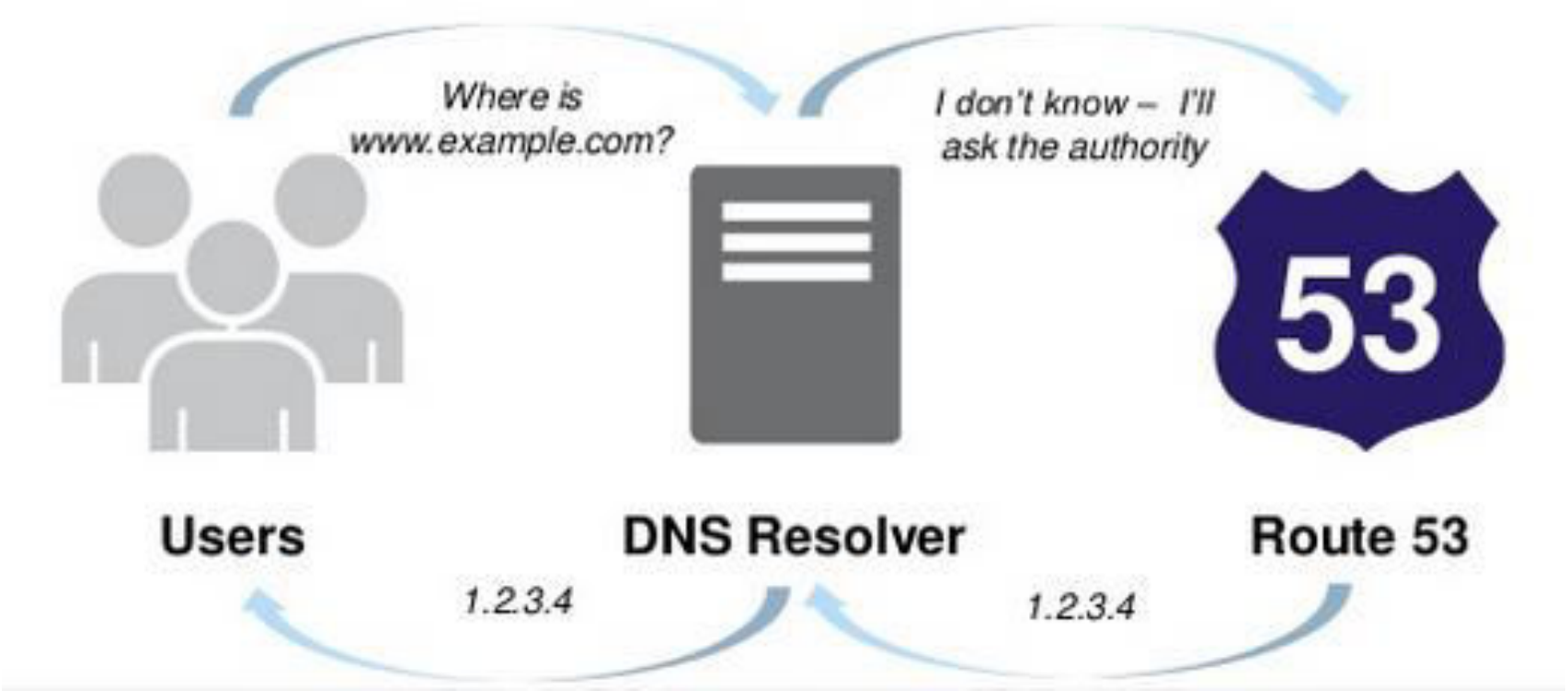
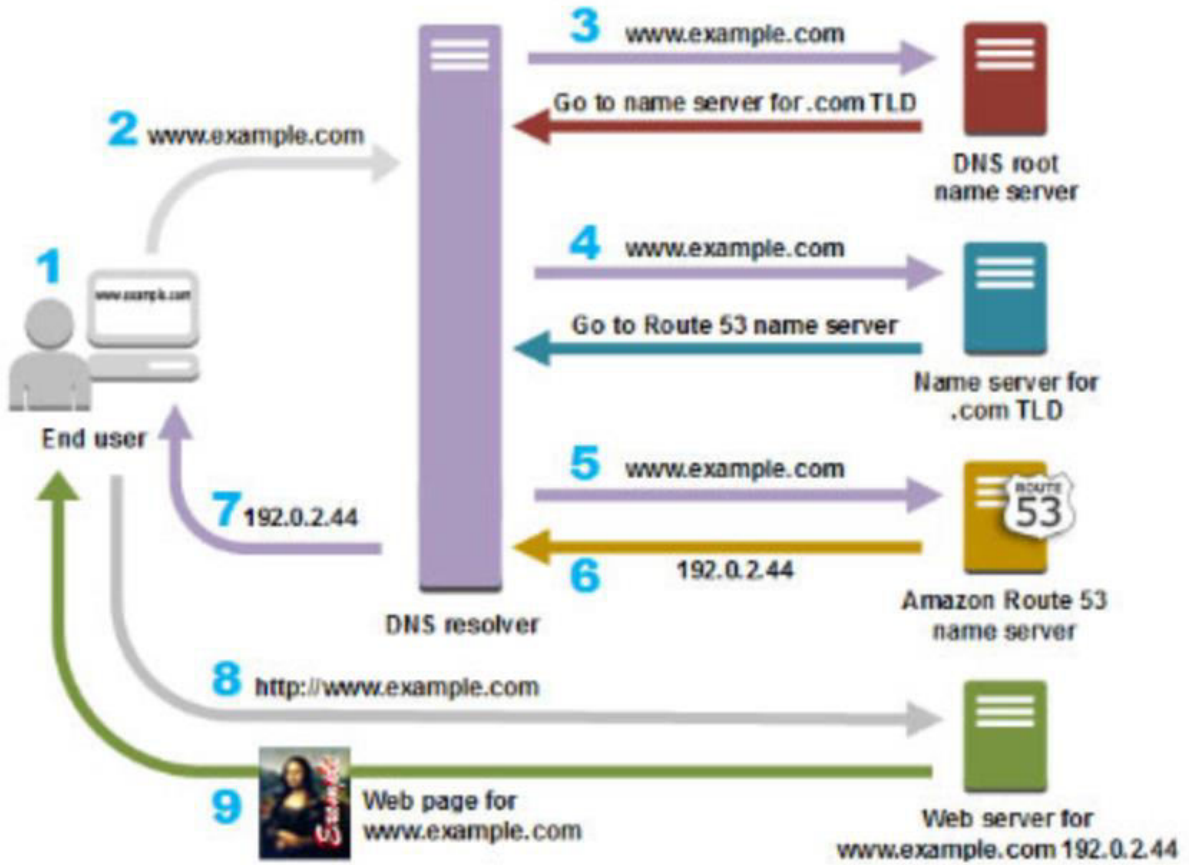
AWS Route53

- **Why only Route53? *Why not any other number*?**


ROOT-LEVEL
DOMAIN SERVER
' . ' NAME SERVER
CONTAINS:-
NAME-SERVER RECORD
HOSTNAME SERVER
HOSTNAME ALIAS
CALLS
REFERRAL
' MEDIUM.COM '
' 104.16.121.127 '
DNS RESOLVER
(CLIENT)
DNS RECURSOR
(INTERNAL DNS SERVER)
IP ADDRESS
TOP-LEVEL
DOMAIN SERVER
' .COM ' NAME SERVER
REFERRAL
SECOND-LEVEL
DOMAIN SERVER
' MEDIUM.COM ' NAME SERVER


Where is
www.example.com?
I don't know – I'll
ask the authority
53
Users
DNS Resolver
Route 53
1.2.3.4
1.2.3.4


1
End user
2 www.example.com
DNS resolver
3 www.example.com
Go to name server for .com TLD
DNS root name server
4 www.example.com
Go to Route 53 name server
Name server for .com TLD
5 www.example.com
6 192.0.2.44
Amazon Route 53 name server
7 192.0.2.44
8 http://www.example.com
9 Web page for www.example.com
Web server for www.example.com 192.0.2.44

What is Route53 ?

- Amazon Route 53 is a highly available and scalable Domain Name System (DNS) web service. You can use Route 53 to perform three main functions in any combination: **domain registration**, **DNS routing**, and **health checking**

- Amazon Route 53 is an authoritative Domain Name System (DNS) service.

- DNS is the system that translates human-readable domain names (example.com) into IP addresses (192.0.2.0). With authoritative name servers in data centers all over the world, Route 53 is reliable, scalable, and fast.

AWS Route 53 Overview

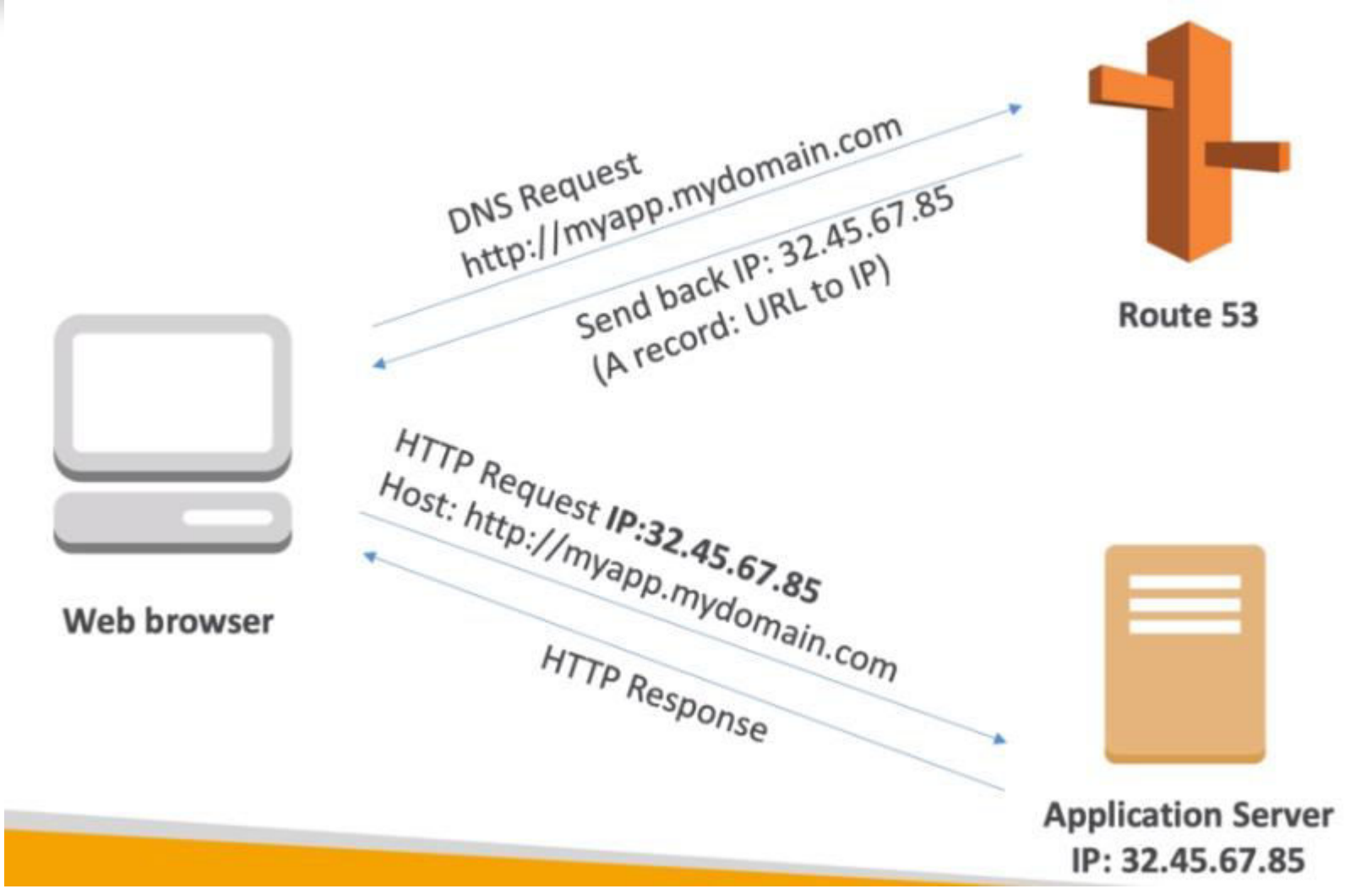
- Route53 is a Managed DNS (Domain Name System)

- DNS is a collection of rules and records which helps clients understand how to reach a server through URLs.

In AWS, the most common records are:

- A : URL to IPv4
- AAAA : URL to IPv6
- CNAME : URL to URL
- Alias : URL to AWS resource

AWS Route 53 Overview



AWS Route 53 Overview

Route53 can use:

- Public domain names you own (or buy).
- Private domain names that can be resolved by your instances in your VPCs.

Route53 has advanced features such as:

- Load balancing (through DNS – also called client load balancing).
- Health checks
- Routing Policy

You pay $0.50 per month per hosted zone

DNS Management – Hosted Zones

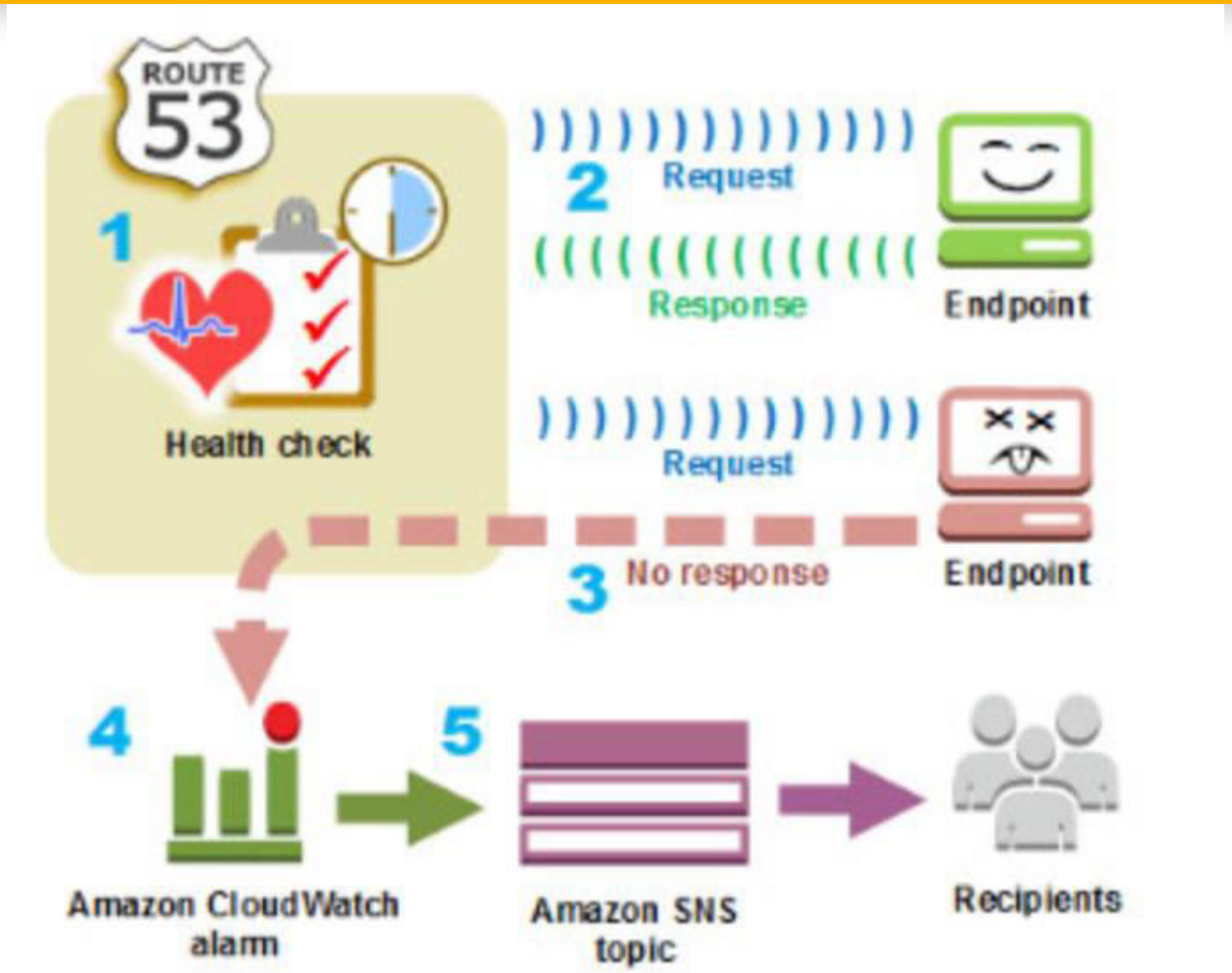
- A hosted zone is a container for records, and records contain information about how you want to route traffic for a specific domain, such as example.com, and its subdomains (apex.example.com, acme.example.com). A hosted zone and the corresponding domain have the same name. There are two types of hosted zones:
- ***Public hosted zones*** contain records that specify how you want to route traffic on the internet
- ***Private hosted zones*** contain records that specify how you want to route traffic in an Amazon VPC

Health Checks

- You can set health checks for individual record sets.
- Can have HTTP, TCP and HTTPS health checks(no SSL verification)
- If a record set fails a health check it will be removed from route53 until it passes the health check.
- You can set SNS notifications to alert you if a health check is failed.

- Demo: Create 3 health checks with each IP address

Health Checks



Supported DNS Records Types

- **A Record Type:** The value for an A record is an IPv4 address in dotted decimal notation
- AAAA Record Type: The value for an AAAA record is an IPV6
- CAA Record Type: lets you specify which certificate Authority are allowed to issue certis for a domain
- **CNAME Record Type:** The value element is the same as the domain name
- MX Record Type
- NAPTR Record Type
- **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.
- PTR Record Type: is same format as domain name.
- **SOA Record Type:** A start of authority (SOA) record provides information about a domain and the corresponding Amazon Route 53 hosted zone.
- SPF Record Type
- SRV Record Type
- TXT Record Type

Start Of Authority (SOA) record

- The name of the server that supplied the data for the zone.
- The administrator of the zone
- The current version of the data file

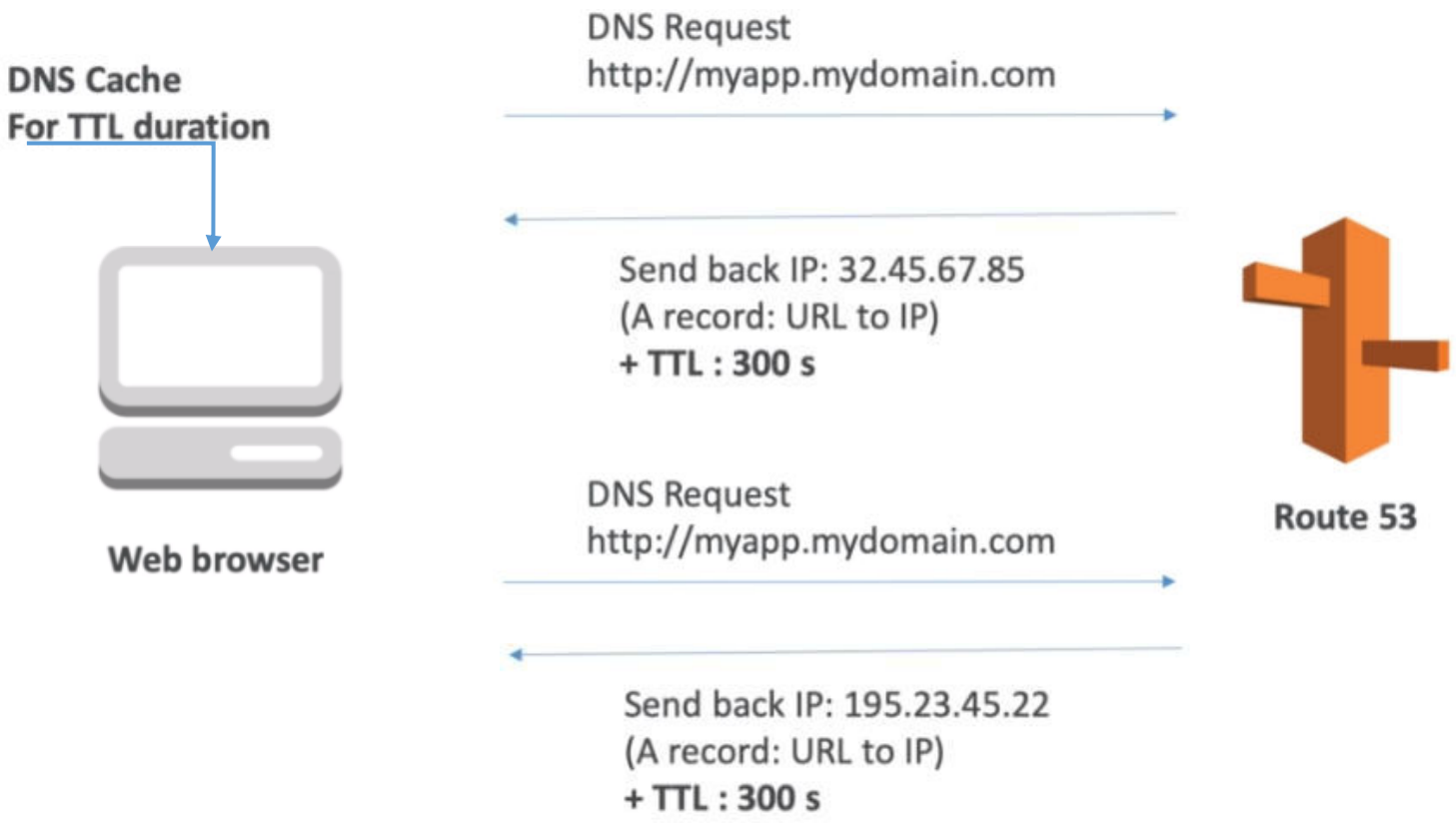
NS stands for Name Server Record

- They are used by Top Level Domain servers to direct traffic to the content DNS server which contains the authoritative DNS record.

What is TTL ?

- The length that a DNS record is cached on either the resolving server or the users own local PC is equal to the value of the TTL in seconds.
- The lower the TTL , the faster changes to DNS records take to propagate throughout the internet.

What is TTL ?



- **High TTL (eg: 24 hrs)**

Less traffic on DNS
Possibly outdated records

- **Low TTL (eg: 60s)**

More traffic on DNS
Records are outdated for less time
Easy to change records

TTL is mandatory for each DNS record

The web browser will cache the DNS record for 300s, once expired it will check with DNS

What is CNAME ?

- The CNAME can be used to resolve one domain name to another.
- ELB to domain name

Alias Record

- Alias records are used to map resources record sets in your hosted zone to Elastic Load Balancers, cloudfront distributions, or S3 buckets that are configured as websites.

- Alias records work like a CNAME record in that you can map one DNS NAME(example.com) to another target DNS name (myelb12.elb.amazonaws.com)

Alias Record

- Key Difference: A CNAME cant be used for naked domain names(zone apex record).
- You cant have CNAME for http://cloudrsh.com , it must be either an A record or Alias.
- Given choice, always choose an Alias record over CNAME.
- CNAME are charged, Alias are not

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.
- **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

- Maps a domain to one URL
- Use when you need to redirect to a single resource
- You **cant attach health checks** to simple routing policy
- If multiple values are returned, a random one is chosen by the client(client side load balancing)
- If you choose the simple routing policy you can only have one record with multiple values in a record.
- Route53 returns all values to the user in random order

Demo on simple routing with 3 diff Ips/ diff regions on value with A record

Weighted Routing Policy

- Allows you to split the traffic based on different weights assigned.

  For Ex: you can set 10% traffic should go to Ireland and 90 % to Mumbai

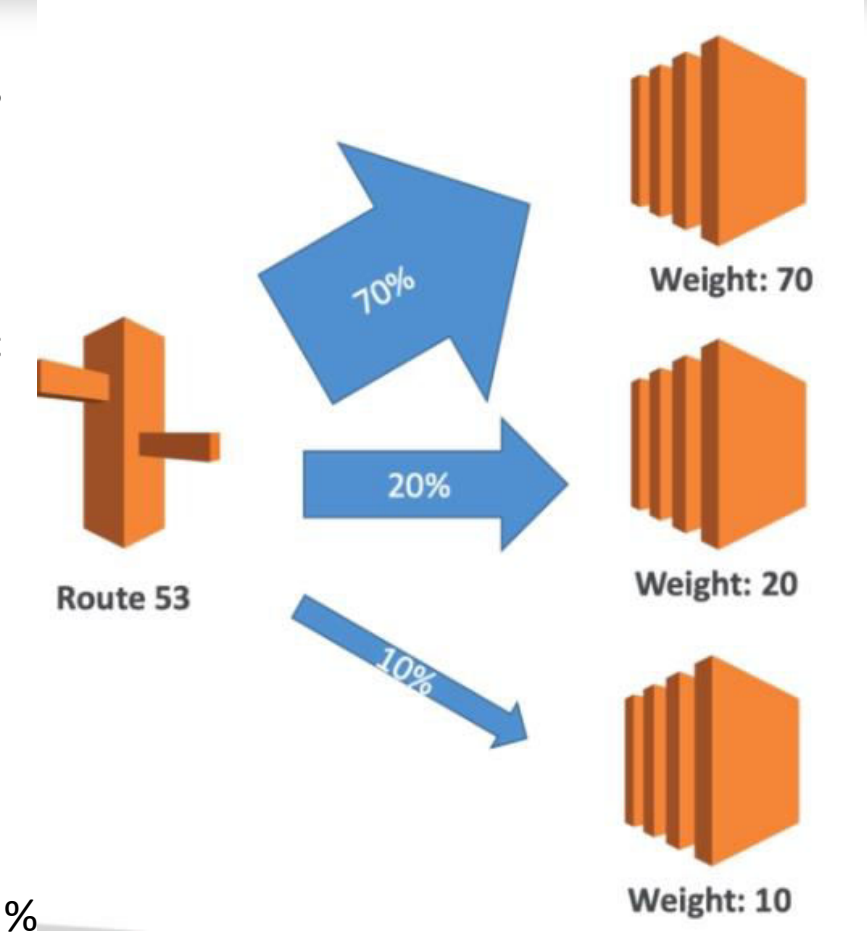
- Control the % of the requests that go to specific endpoints

- Helpful to test 1 % of traffic on new app version for example

- Helpful to split traffic between two regions

- Can be associated with Health checks

Demo: Create 3 weighted records with 3 diff Ips with %



Latency-Based Routing Policy

Allows you to route your traffic based on the lowest network latency for your end user.(ie, which region will give them the fastest response time).

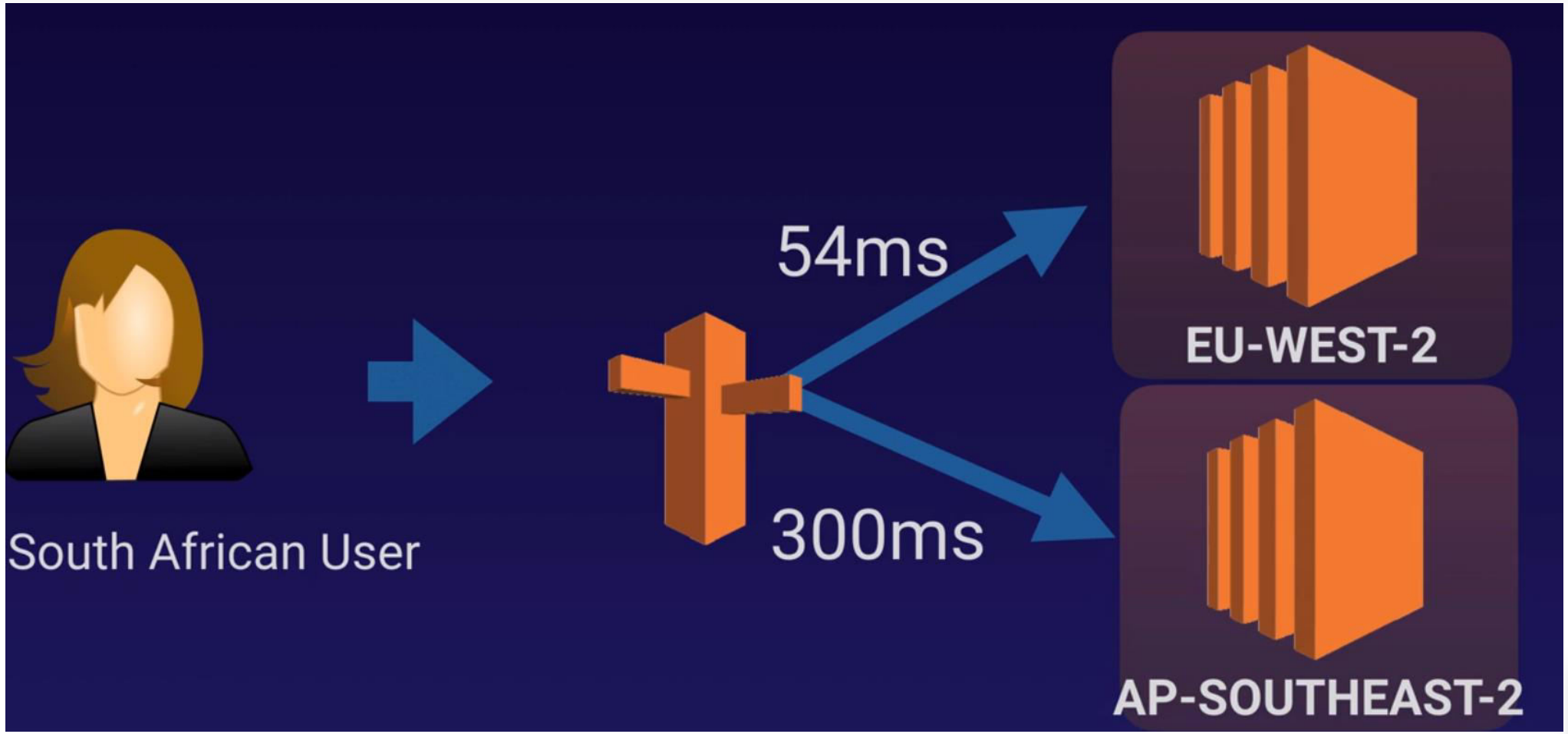
To use latency-based routing, you create a latency resource record set for the EC2 or ELB resource in each region that hosts your website.

When Amazon Route53 receives a query for your site, it selects the latency resource record set for the region that gives the user the lowest latency.

Route 53 then responds with the value associated with that resource record set.

Demo: Create 3 diff records with latency policy with 3 diff Ips and use VPN

Latency-Based Routing Policy



Failover Routing Policy

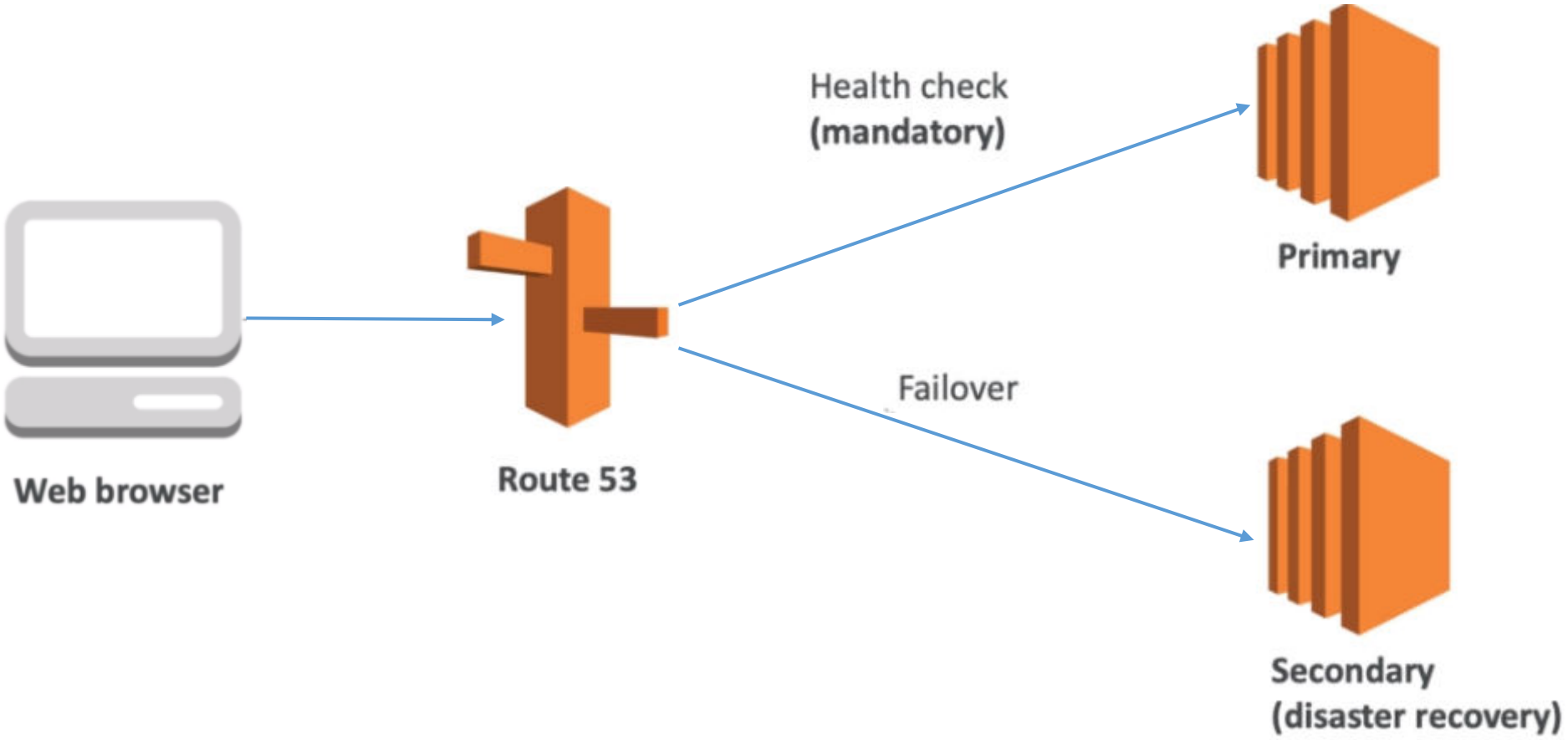
Failover routing policies are used when you want to create an active/passive setup.

For Ex: you may want your primary site to be in Mumbai and DR site in Ireland

Route53 will monitor the health of your primary site using a health check.

A health check monitors the health of your end points

Failover Routing Policy



GeoLocation Routing Policy

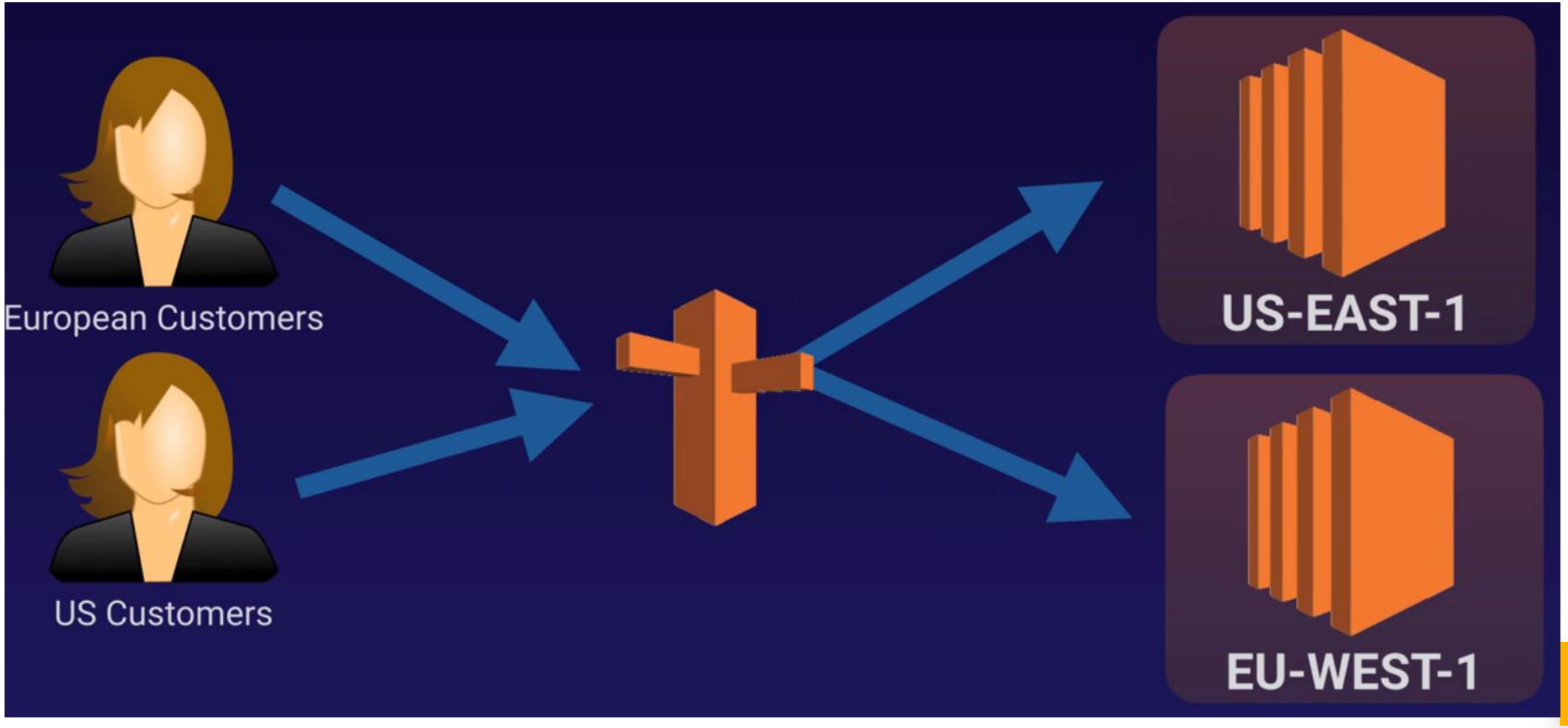
Geolocation routing lets you choose where your traffic will be sent based on the geographical location of your users(ie, the location from which DNS queries originate).

For Ex: You might want all queries from Europe to be routed to a fleet of EC2 instances that are specifically configured for your European customers.

These servers have local language and displays Euros instead dollars.

Demo: Create 3 records with 3 diff Ips with no health checks and keep 1 default for all default traffic.

GeoLocation Routing Policy



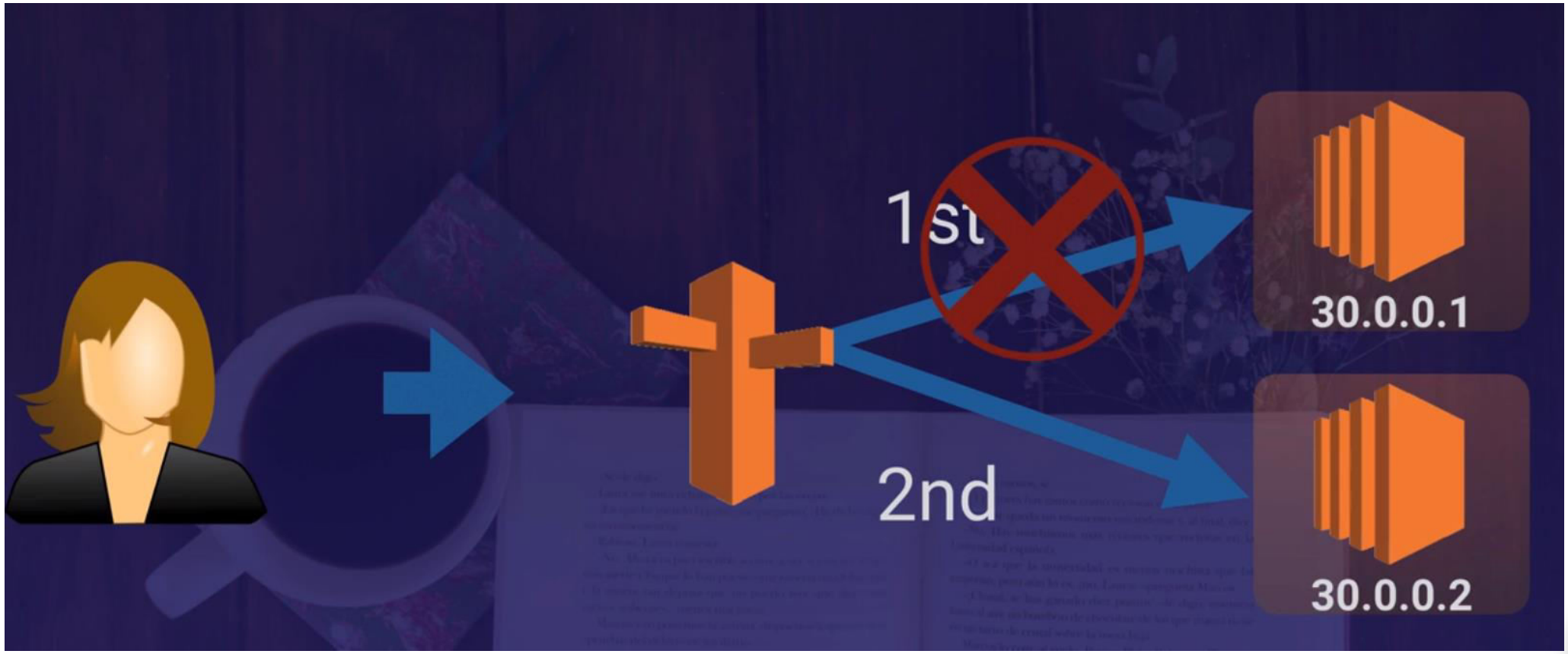
MultiValue Answer Routing Policy

MultiValue answer routing lets you configure Amazon Route53 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 to check the health of the each resource, so Route3 will return only values for healthy resources.

This is very similar to simple routing however it allows you to put health check on each record set

MultiValue Answer Routing Policy



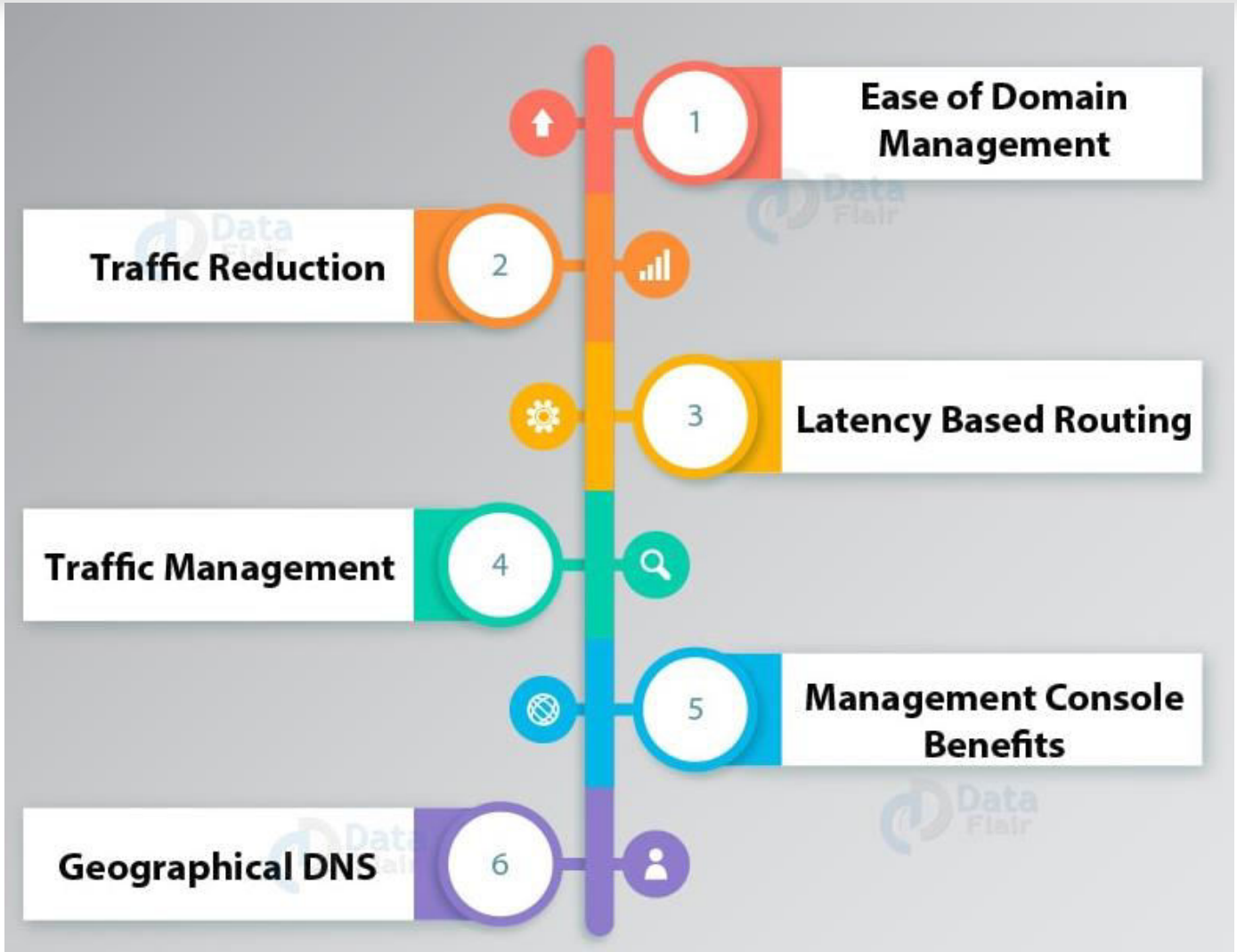
Features of Route53

- Easy to register your domain – We can purchase all level of domains like .com, .net, .org, etc. directly from Route 53.
- **Highly reliable** – Route 53 is built using AWS infrastructure. Its distributed nature towards DNS servers help to ensure a consistent ability to route applications of end users.
- **Scalable** – Route 53 is designed in such a way that it automatically handles large volume queries without the user's interaction.
- **Can be used with other AWS Services** – Route 53 also works with other AWS services. It can be used to map domain names to our Amazon EC2 instances, Amazon S3 buckets, Amazon and other AWS resources.

Features of Route53

- **Easy to use** – It is easy to sign-up, easy to configure DNS settings, and provides quick response to DNS queries.
- **Health Check**: Route 53 monitors the health of the application. If an outage is detected, then it automatically redirects the users to a healthy resource.
- **Cost-Effective** – Pay only for the domain service and the number of queries that the service answers for each domain.
- **Secure** – By integrating Route 53 with AWS (IAM), there is complete control over every user within the AWS account, such as deciding which user can access which part of Route 53.

Features of Route53



Exam Tips

- ELB's don't have an IP address. You resolve them using a DNS name. For naked domain names like (bbc.co.uk) a IPv4 address is needed. Amazon resolves this by using Alias Records.
- Alias Records allow you to resolve naked domain names (Zone Apex record) to an ELB DNS record not CNAMES.
- Alias records are not charged, CNAME are charged
- 50 Domains per account and 500 public hosted zones per account, no limit on private hosted zones.