

# Amazon Route53

Def:

Amazon Route53 is a scalable and highly available **Domain Name System (DNS)** web service provided by Amazon Web Services (AWS).

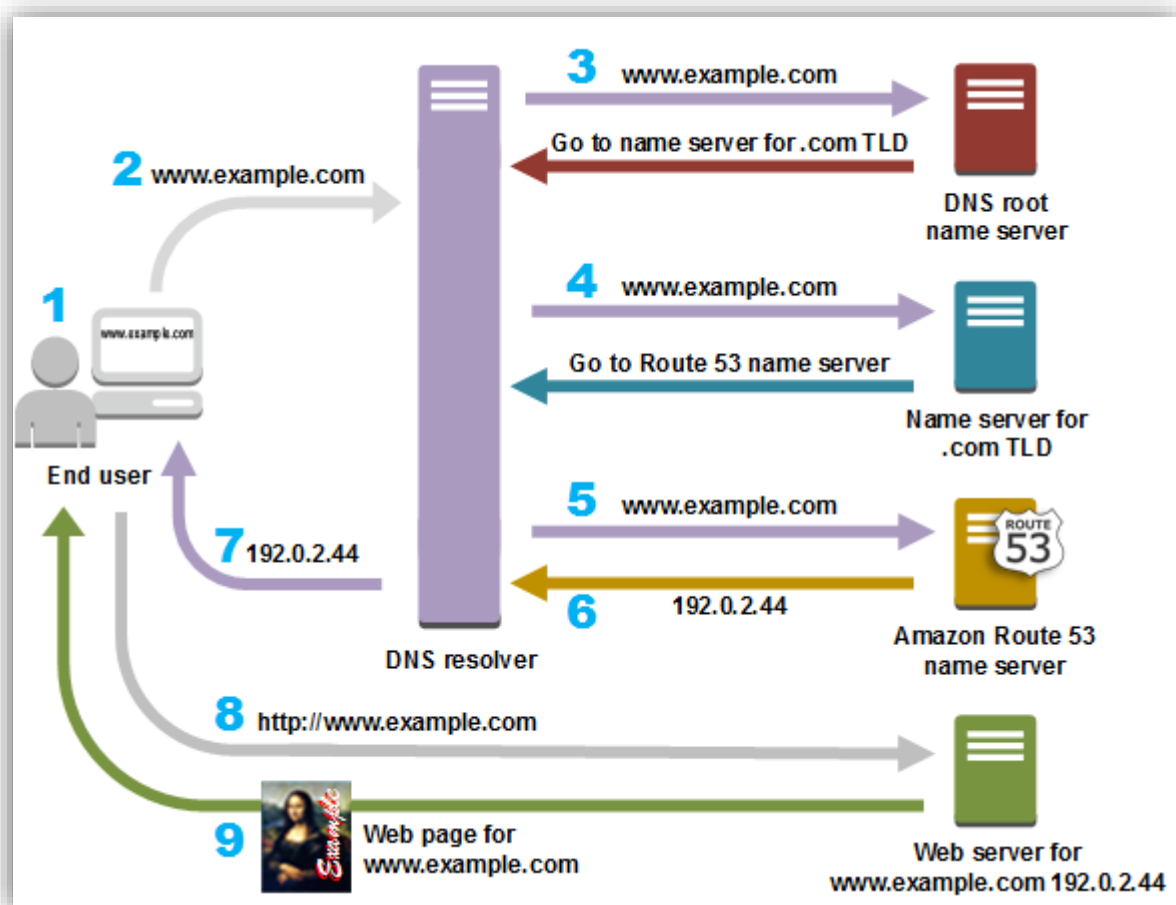
→ It is designed to help developers and businesses route end users to Internet applications by translating domain names into IP addresses.

→ You can use Route 53 to perform three main functions in any combination: domain registration, DNS routing, and health checking.

**TLD:** top-level domain

.com , .net , .in , .ac

✓ How Amazon Route 53 routes traffic for your domain?



## Working of DNS

### Step 1:

A user opens a web browser, **enters** **www.example.com** in the address bar, and presses Enter.

### Step 2: DNS resolver

The request for **www.example.com** is routed to a DNS resolver, which is typically managed by the user's internet service provider (ISP), such as a cable internet provider, a DSL broadband provider, or a corporate network.

#### *DNS resolver:*

A DNS resolver is a piece of software that converts domain names into IP addresses by querying the DNS system.

*DNS resolvers are a critical component of the Internet infrastructure, allowing users to **access websites** and other resources **by** their **domain names**, rather than having to remember IP addresses.*

#### *ISP:*


ISP stands for Internet Service Provider. An ISP is a company that provides internet access to customers or businesses.

ISPs offer a range of internet connectivity services, such as dial-up, broadband, and wireless connections.

### Name servers:

#### Recursive and non-recursive

Recursive and non-recursive are two **modes of operation** for DNS queries.

 In recursive mode, a DNS resolver sends a query to a DNS server, requesting the server to provide the IP address associated with a

particular domain name. If the server does not have the IP address in its cache, it will recursively query other DNS servers until it finds the IP address and returns it to the resolver. The resolver then caches the IP address for a period of time, so that it can respond more quickly to future queries for the same domain name.

▶ In non-recursive mode, a DNS resolver sends a query to a DNS server, requesting the server to provide the IP address associated with a particular domain name. If the server does not have the IP address in its cache, it will either return an **error** message to the resolver or refer the resolver to another DNS server that may be able to answer the query.

*Recursive mode is typically used by end-user devices such as desktops, laptops, and smartphones, as well as by DNS resolvers operated by ISPs and other service providers.*

When a DNS resolver receives a query for a domain name:

It first contacts the root servers, then the TLD servers, and finally the authoritative name servers for the domain.

## Step 3:

The DNS resolver for the ISP forwards the request for `www.example.com` to a DNS root name server.

### 1. Root Server:

The root servers contain information about the top-level domains (.com, .org, .net, etc.) and their associated authoritative DNS servers. When a DNS resolver receives a query for a domain name, it first contacts one of the root servers to determine which TLD server is responsible for that

domain. The root servers respond to queries with a referral to the appropriate TLD server.

## 2. TLD (Top Level Domain):

TLD refers to the highest level of the Domain Name System (DNS) hierarchy. TLDs are the extensions that appear at the end of a domain name, such as .com, .org, .net, .edu, and .gov. There are **two** types of TLDs: **generic TLDs** (gTLDs), which are open for registration by anyone, and **country-code TLDs** (ccTLDs), which are reserved for use by specific countries.

## 3. Authoritative Name Server:

An authoritative name server is a DNS server that stores the actual DNS records for a particular domain name. When a DNS resolver receives a query for a domain name, it first contacts the root servers, then the TLD servers, and finally the authoritative name servers for the domain. The authoritative name server responds to the query with the IP address or other information associated with the domain name.

## Step 4:

The DNS resolver forwards the request for `www.example.com` again, this time to one of the TLD name servers for **.com domains**. The name server for .com domains responds to the request with the names of the four Route 53 name servers that are associated with the `example.com` domain.

*The DNS resolver caches (stores) the four Route 53 name servers. The next time someone browses to `example.com`, the resolver skips steps 3 and 4 because it already has the name servers for `example.com`. The name servers are typically cached for two days.*

## Step 5:

The DNS resolver chooses a Route 53 name server and forwards the request for `www.example.com` to that **name server**.

## Step 6:

The Route 53 name server looks in the `example.com` hosted zone for the `www.example.com` record, gets the associated value, such as the IP address for a web server, `192.0.2.44`, and **returns the IP address** to the DNS resolver.

## Step 7:

The DNS resolver finally has the IP address that the user needs. The resolver returns that value to the web browser.

## Step 8:

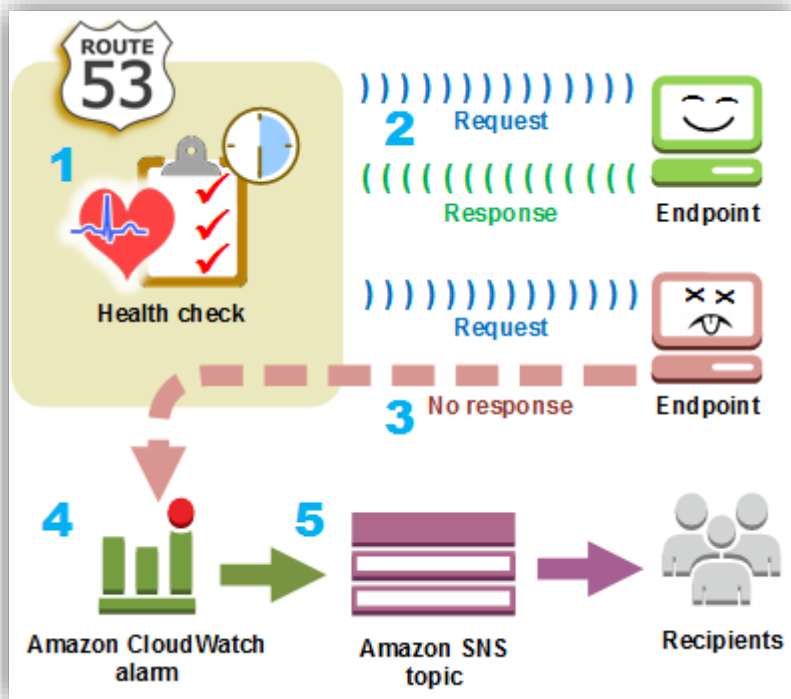
The web browser sends a request for `www.example.com` to the IP address that it got from the DNS resolver. This is where your content is, for example, a web server running on an Amazon EC2 instance or an Amazon S3 bucket that's configured as a website endpoint.

## Step 9:

The web server or other resource at `192.0.2.44` returns the web page for `www.example.com` to the web browser, and the web browser displays the page.

## How Amazon Route 53 checks the health of your resources

- DNS failover
- endpoint
- health check



## Routing policy: Exam Que IMP

A setting for records that determines how Route 53 responds to DNS queries. Route 53 supports the following routing policies:

**1. Simple routing policy –**

Use to route internet traffic to a single resource that performs a given function for your domain, for example, a web server that serves content for the example.com website.

**2. Failover routing policy –**

Use when you want to configure active-passive failover.

**3. Geolocation routing policy –**

Use when you want to route internet traffic to your resources based on the location of your users.

**4. 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.

**5. Latency routing policy –**

Use when you have resources in multiple locations and you want to route traffic to the resource that provides the best latency.

**6. IP-based routing policy –**

Use when you want to route traffic based on the location of your users, and have the IP addresses that the traffic originates from.

**7. Multivalue answer routing policy –**

Use when you want Route 53 to respond to DNS queries with up to eight healthy records selected at random.

**8. Weighted routing policy –**

Use to route traffic to multiple resources in proportions that you specify.