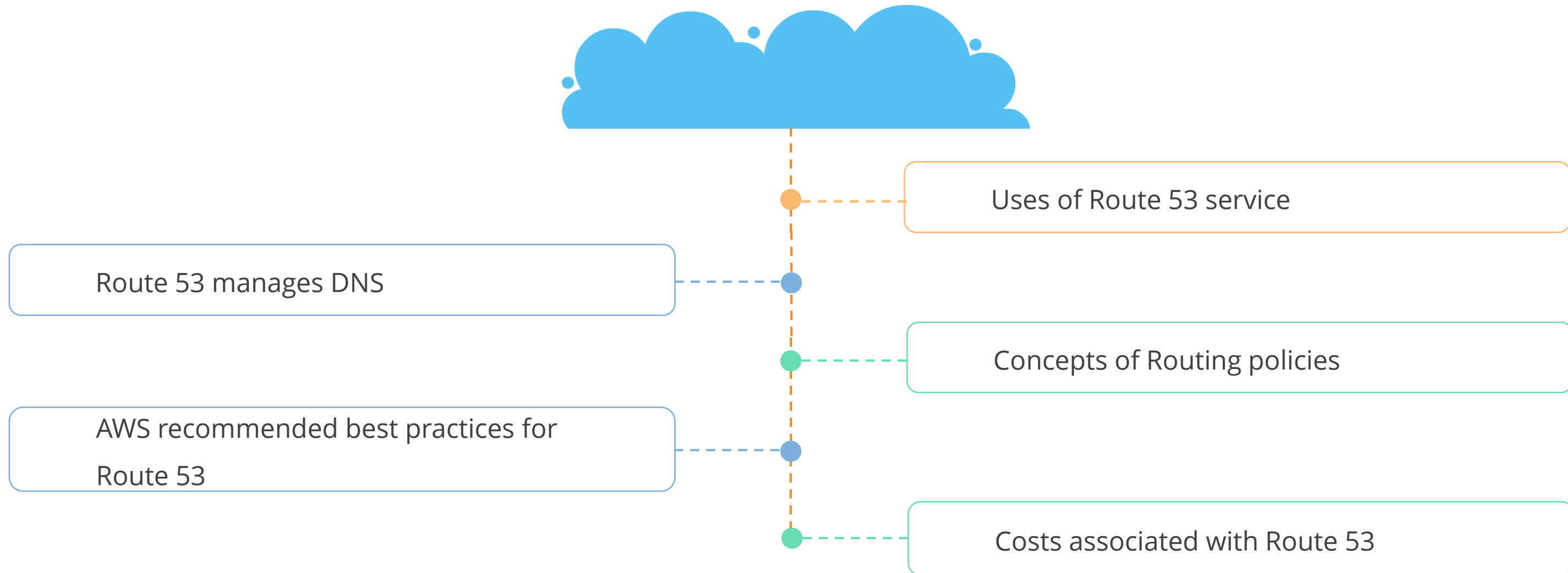


AWS Solutions Architect—Associate Level

Lesson 7: Amazon Route 53



What You'll Learn



Amazon Route 53 Overview

Overview of Route 53 concepts

Amazon Route 53 Overview

Amazon's definition of Route 53:

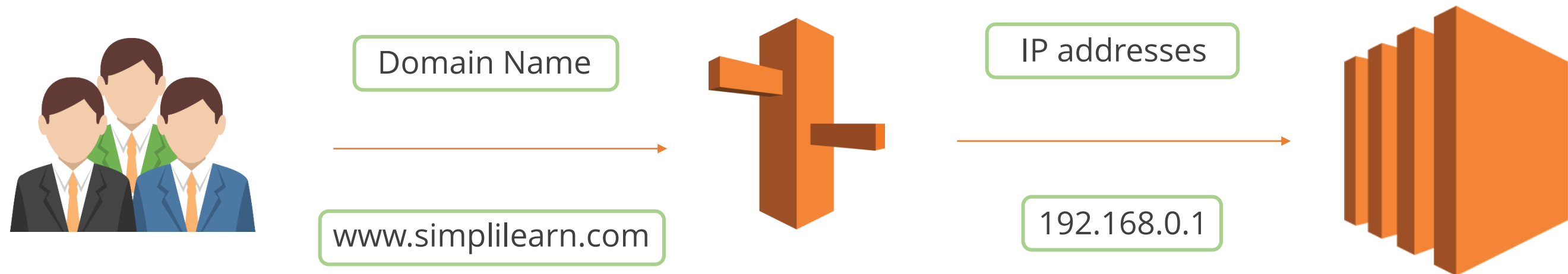
"It is a highly available and scalable cloud Domain Name Servers (DNS) web service."



**Amazon
Route 53**

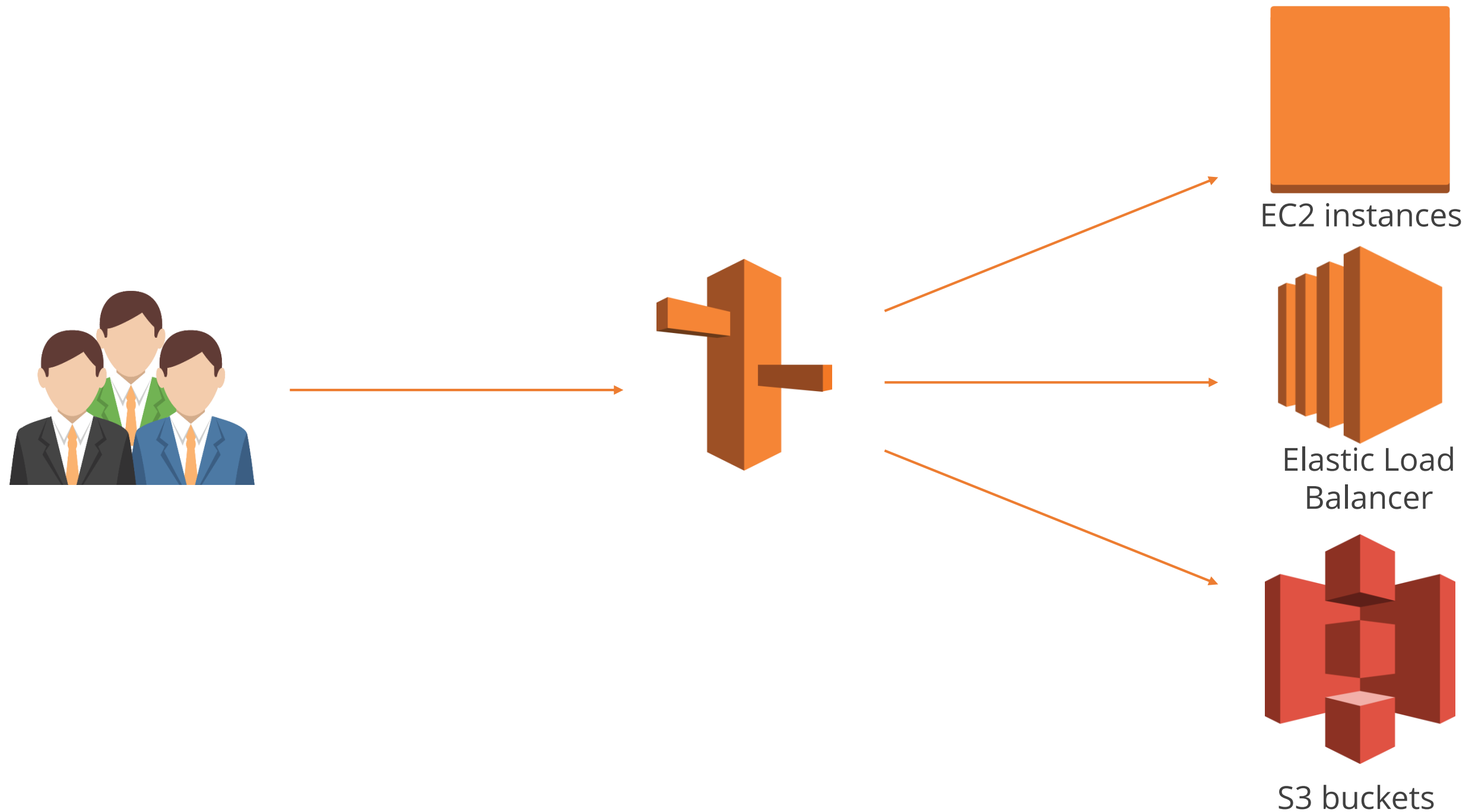
Domain Name Servers (DNS)

DNS provides a directory of domain names and translates them to IP addresses.



Route 53 Uses

You can use Route 53 to route user traffic to AWS resources like EC2 instances, ELB, or S3 buckets.

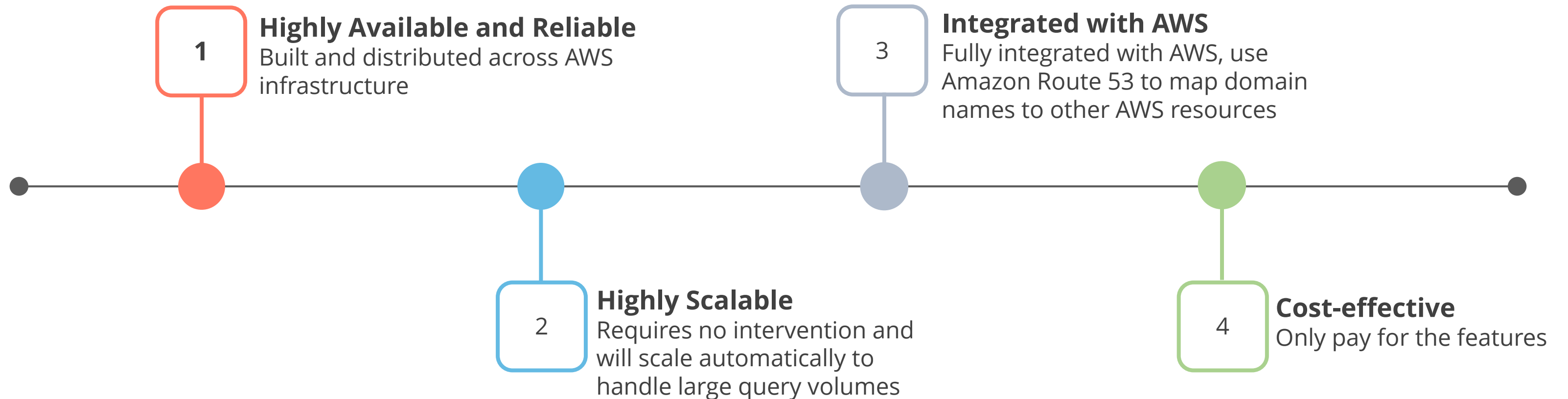


Domain Name Registration

Route 53 provides Domain Name Registration so you can manage your domain names, such as www.simplilearn.com.

Route 53 Benefits

Following are the Route 53 benefits:

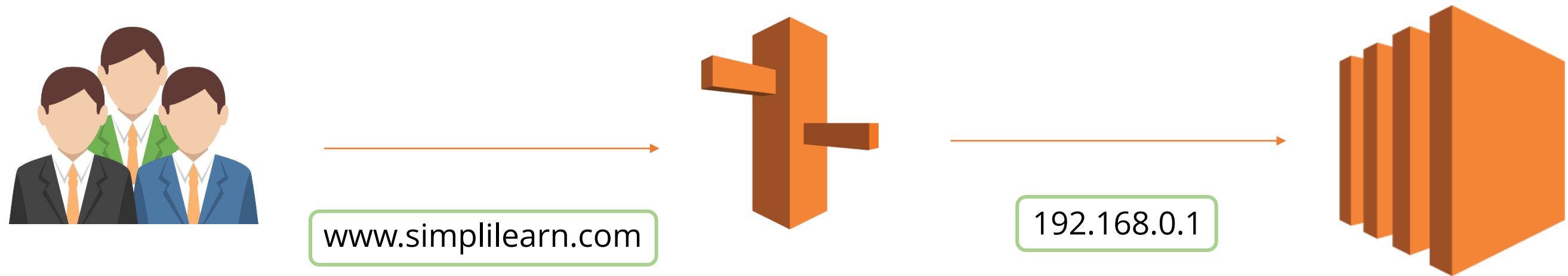


Amazon Route 53 and DNS

Details about Route 53 and DNS

DNS

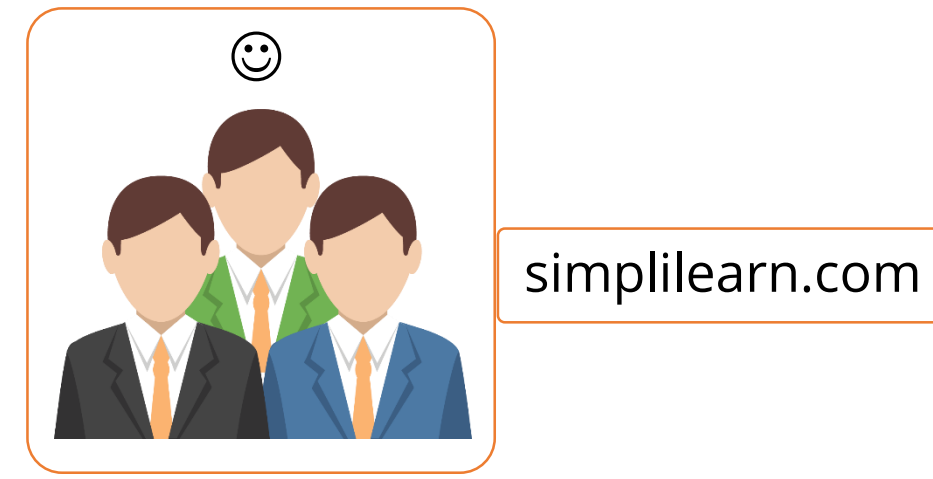
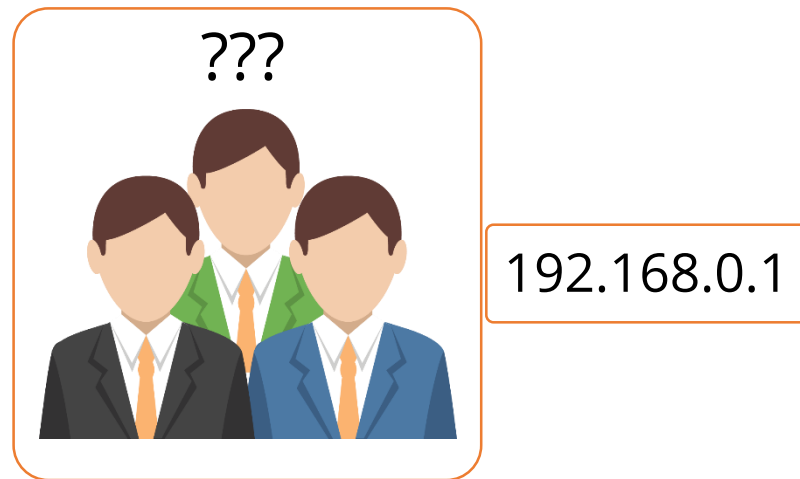
DNS is used to translate domain names into IP addresses.



Terminologies

1. Domain Name

Human-friendly name for an Internet resource



Terminologies (contd.)

2. IP Address

IP address is a network addressable location.

Each IP address has to be unique within its network. In your AWS VPC, you can have IP addresses like 10.0.1.0, but for websites, the network is the Internet, so a unique IP address is required.

An IPv4 address (dotted-decimal notation)

172 . 16 . 254 . 1

↓ ↓ ↓ ↓
10101100 . 00010000 . 11111110 . 00000001

└───┘ └───┘
One byte=Eight bits

└──────────────────────────┘
Thirty-two bits (4 x 8), or 4 bytes

10.0.1.0

An IPv6 address (dotted-decimal notation)

2001:0DB8:AC10:FE01:0000:0000:0000:0000

↓ ↓ ↓ ↓
2001:0DB8:AC10:FE01:: Zeroes can be omitted
001000000000000001:00000110110111000:1000110000010000:1111111000000001

0000000000000000:0000000000000000:0000000000000000:0000000000000000

Terminologies (contd.)

3. Top-Level Domain

A Top-Level Domain is the portion of the domain name furthest to the right.

Simplilearn.com

↑
com

charity.org

↑
org

University.edu

↑
edu

Terminologies (contd.)

4. Hosts

The domain owner can define individual hosts within a domain that refers to separate services or computers.



Terminologies (contd.)

5. Subdomains

Subdomains are the parts that are underneath the top-level domain.



Terminologies (contd.)

6. Fully Qualified Domain Name (FQDN)

A Fully Qualified Domain Name, or FQDN, also called an absolute domain, is the complete domain name for a specific computer on the Internet.

mail.charity.org

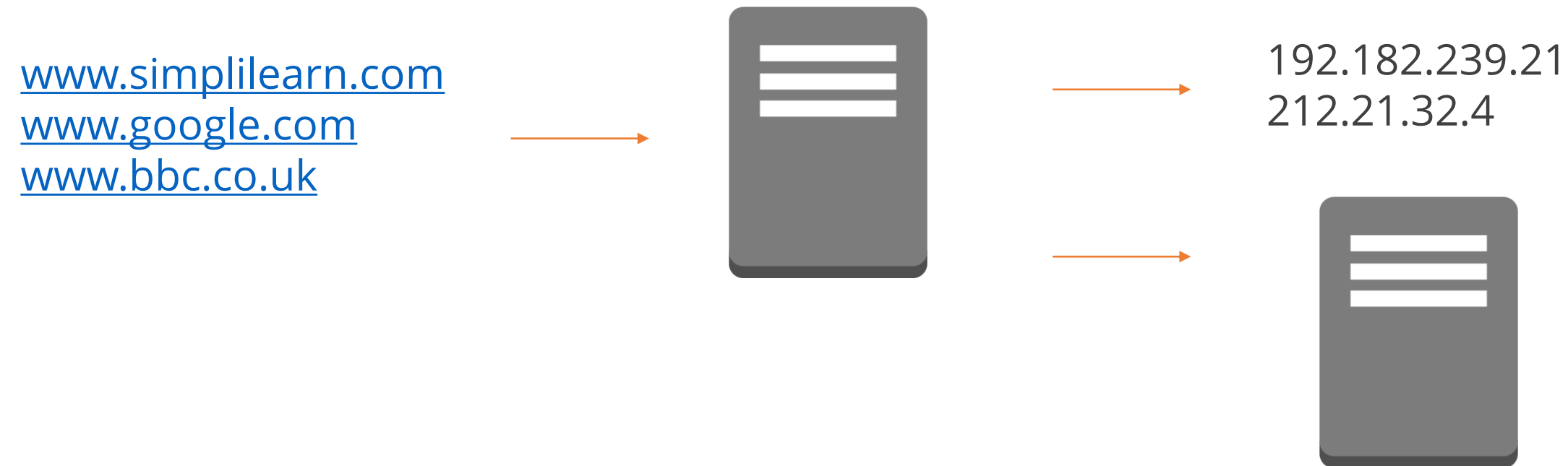


FQDN

Terminologies (contd.)

7. Name Server (NS)

A Name Server is a computer or service that translates domain names into IP addresses.



Terminologies (contd.)

8. Zone Files

Zone Files reside in name servers and are text files that contain the mappings between domain names and IP addresses.

```
$ORIGIN example.com
$TTL 86400
@      IN      SOA      dns1.example.com.      hostmaster.example.com. (
                                2001062501 ; serial
                                21600      ; refresh after 6 hours
                                3600       ; retry after 1 hour
                                604800    ; expire after 1 week
                                86400 )    ; minimum TTL of 1 day

                                IN      NS      dns1.example.com.
                                IN      NS      dns2.example.com.

                                IN      MX      10      mail.example.com.
                                IN      MX      20      mail2.example.com.

                                IN      A       10.0.1.5

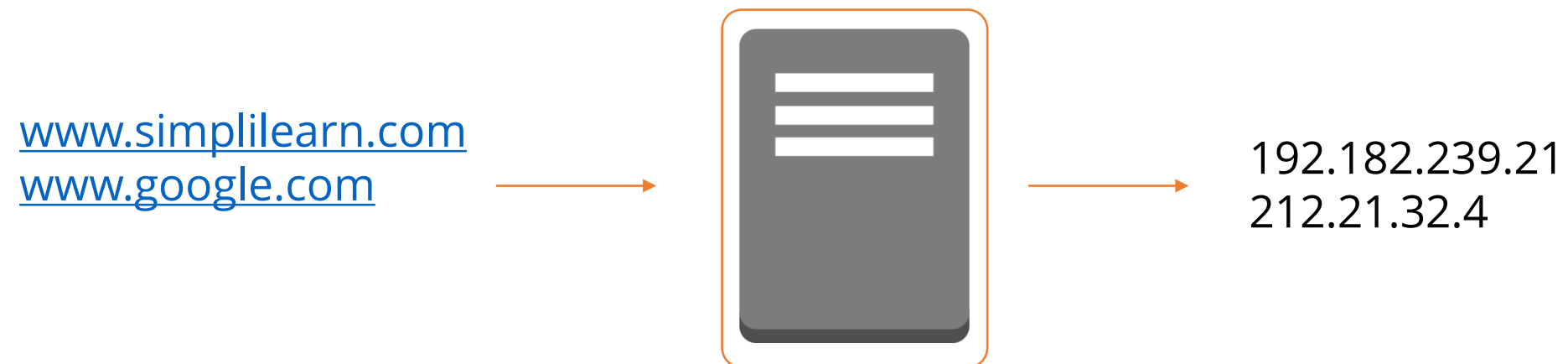
server1      IN      A       10.0.1.5
server2      IN      A       10.0.1.7
dns1         IN      A       10.0.1.2
dns2         IN      A       10.0.1.3

ftp          IN      CNAME    server1
mail         IN      CNAME    server1
mail2        IN      CNAME    server2
www          IN      CNAME    server2
```

Terminologies (contd.)

9. Start of Authority (SOA)

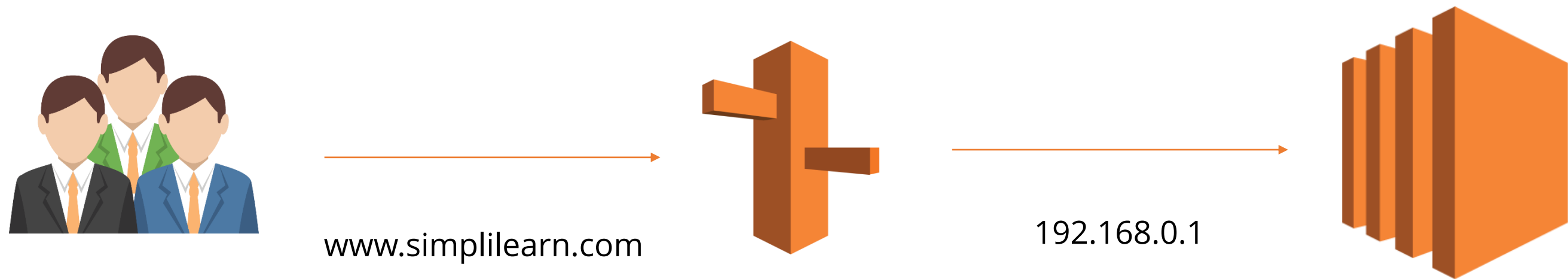
A Start of Authority, or SOA, record is mandatory for every domain.



Terminologies (contd.)

10. Time-To-Live (TTL)

Time-to-Live, or TTL is the length of time (in seconds) that a DNS record is cached on a DNS server or on your PC before it rechecks the details.



Terminologies (contd.)

11.Records

A record maps a resource to a name.

www.simplilearn.com	→	192.182.239.21
www.google.com	→	212.21.32.4

Records

There are four record types:

A Record

An “A Record” matches a domain (or subdomain) to an IP address.

CNAME

example.com	A	12.34.56.78
-------------	---	-------------

NS Record

Alias Record

Records (contd.)

There are four record types:

A Record

CNAME

NS Record

Alias Record

Canonical Name (CNAME) record matches a domain or subdomain to a different domain.

```
alias.com      CNAME  example.com.
```

Records (contd.)

There are four record types:

A Record

CNAME

NS Record

Alias Record

A NameServer Record (NS Record) stores information about the name servers for a domain.

example.com	NS	ns1.linode.com.
example.com	NS	ns2.linode.com.

Records (contd.)

There are four record types:

A Record

CNAME

NS Record

Alias Record

An Alias Record is an AWS-created record and used only within AWS. It is similar to a CNAME, however, it's used to map DNS names to ELB, S3 buckets, and CloudFront distributions within your hosted zone.



Alias Record Summary

The following points present a summary of an Alias Record:

Automatically recognizes changes in the records sets that the Alias Record refers to



Always choose an Alias Record over a CNAME



You aren't charged to requests sent to an Alias Record, but you are for a CNAME





Knowledge Check

KNOWLEDGE
CHECK

Why did AWS create an Alias Record?

- a. To create mappings to devices that have constantly changing IP addresses, like ELB, S3 buckets, and so on
- b. Because CNAMEs and A Records are becoming defunct
- c. So you can create instances in different regions with the same name
- d. To increase the performance of an ELB



KNOWLEDGE
CHECK

Why did AWS create an Alias Record?

- a. To create mappings to devices that have constantly changing IP addresses, like ELB, S3 buckets, and so on
- b. Because CNAMEs and A Records are becoming defunct
- c. So you can create instances in different regions with the same name
- d. To increase the performance of an ELB



The correct answer is **a.**

Alias Records were created to resolve the issue of CNAME naked domain mapping to A Record IP addresses. With some AWS services like ELB, the IP address is not always known.

Route 53 Routing Policies

Details of Amazon Route 53 Routing Policies

Routing Policies

A routing policy determines how Amazon Route 53 responds to queries. There are five available methods:

Simple

Weighted

Latency

Failover

Geolocation

Routing Policies (contd.)

Simple

Weighted

Latency

Failover

Geolocation

“Simple” is the default routing policy for a single resource.



→
www.simplilearn.com



→
192.168.0.1



Routing Policies (contd.)

Simple

Weighted

Latency

Failover

Geolocation

“Weighted” routing policy can split traffic based on different weights assigned.



Routing Policies (contd.)

Simple

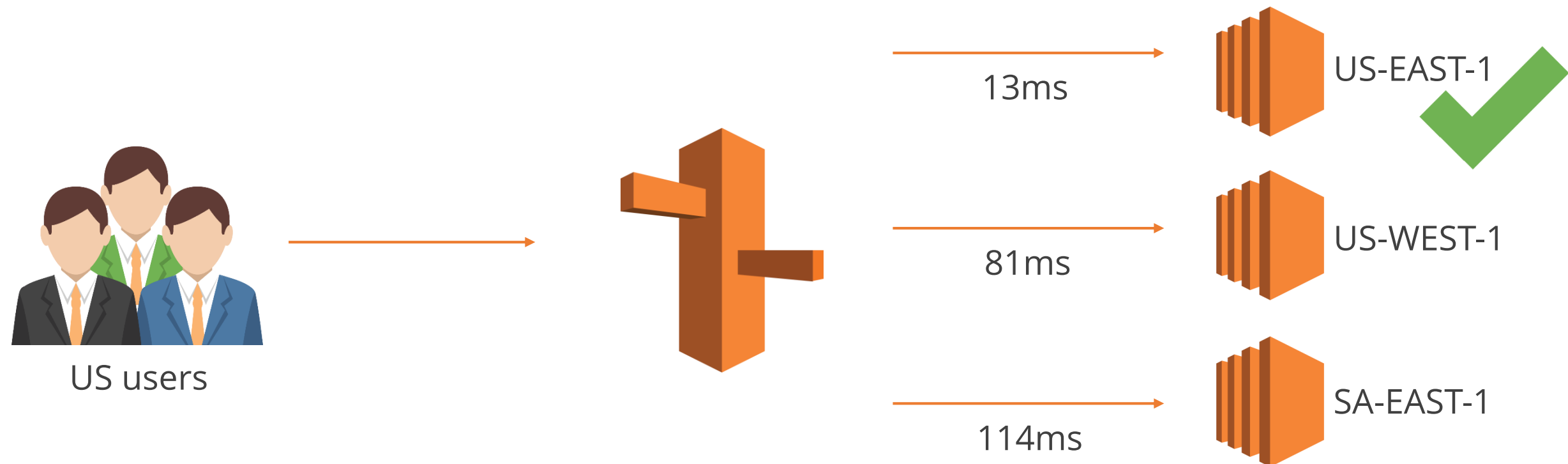
Weighted

Latency

Failover

Geolocation

“Latency” routing policy allows you to route traffic based on the lowest network latency for your end user.



Routing Policies (contd.)

Simple

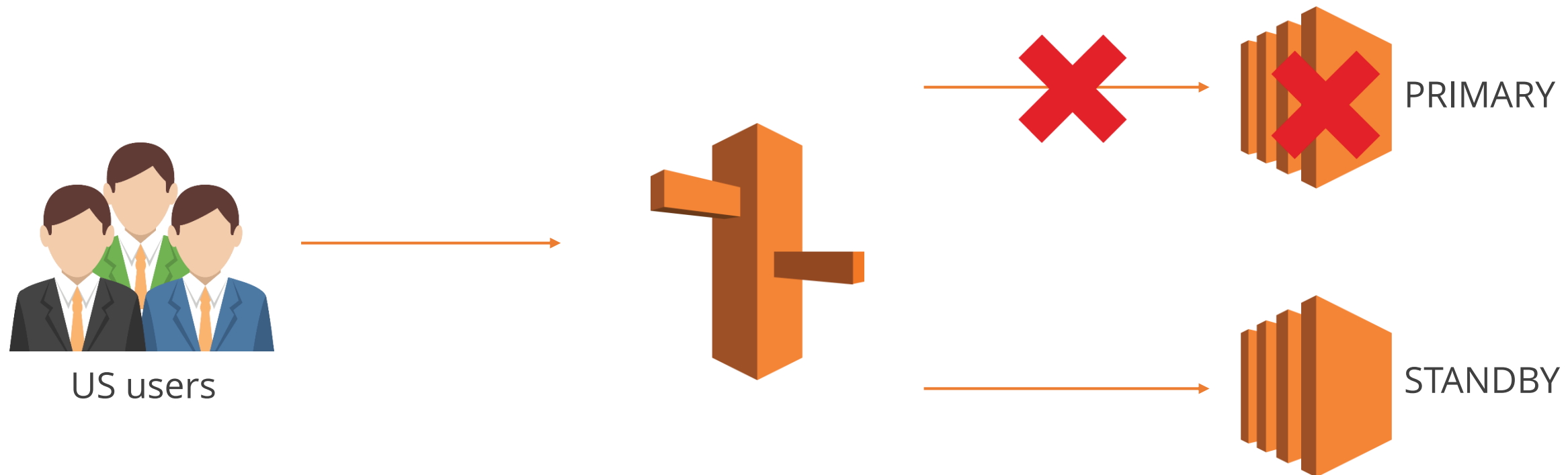
Weighted

Latency

Failover

Geolocation

“Failover” routing policy allows you to have an active/passive setup.



Routing Policies (contd.)

Simple

Weighted

Latency

Failover

Geolocation

“Geolocation” routing policy routes traffic based on the geographic location of your users.



US users



UK users



US-EAST-1



EU-WEST-1



Demo 1: Route 53 Hosted Zones

Demonstrate how to configure Route 53 Hosted Zones.



Knowledge Check

KNOWLEDGE
CHECK

Which of the following are Amazon Route 53 Routing Policies?

- a. Simple, Weighted, Network, Failover, and Geolocation
- b. Easy, Weighted, Latency, Migration, and Geolocation
- c. Easy, Defined, Latency, Failover, and Geodiverse
- d. Simple, Weighted, Latency, Failover, and Geolocation



KNOWLEDGE
CHECK

Which of the following are Amazon Route 53 Routing Policies?

- a. Simple, Weighted, Network, Failover, and Geolocation
- b. Easy, Weighted, Latency, Migration, and Geolocation
- c. Easy, Defined, Latency, Failover, and Geodiverse
- d. Simple, Weighted, Latency, Failover, and Geolocation



The correct answer is **d.**

Simple, Weighted, Latency, Failover, and Geolocation are Amazon Route 53 Routing Policies.

Amazon Route 53 Best Practices

Overview of AWS Best Practices for Route 53

Route 53 Best Practices

Following are the Route 53 best practices:

Name Server Delegation

TTL Resource Record Sets

Alias Records vs. CNAME

Minimize Latency

1. Route 53 hosted zones assign a delegation set of 4 name servers (.com, .net, .org, and .co.uk).
2. Update your registrar's name server configuration with all of these name servers to provide maximum availability.

Route 53 Best Practices (contd.)

Following are the Route 53 best practices:

Name Server Delegation

TTL Resource Record Sets

Alias Records vs. CNAME

Minimize Latency

1. Resource records can benefit from a lower TTL value.
2. For long TTLs, DNS resolvers take longer to request updated DNS records.

Route 53 Best Practices (contd.)

Following are the Route 53 best practices:

Name Server Delegation

TTL Resource Record Sets

Alias Records vs. CNAME

Minimize Latency

1. When configuring resource record sets that route DNS queries to AWS resources, use Alias Record sets.
2. Alias Record sets are free of charge.

Route 53 Best Practices (contd.)

Following are the Route 53 best practices:

Name Server Delegation

TTL Resource Record Sets

Alias Records vs. CNAME

Minimize Latency

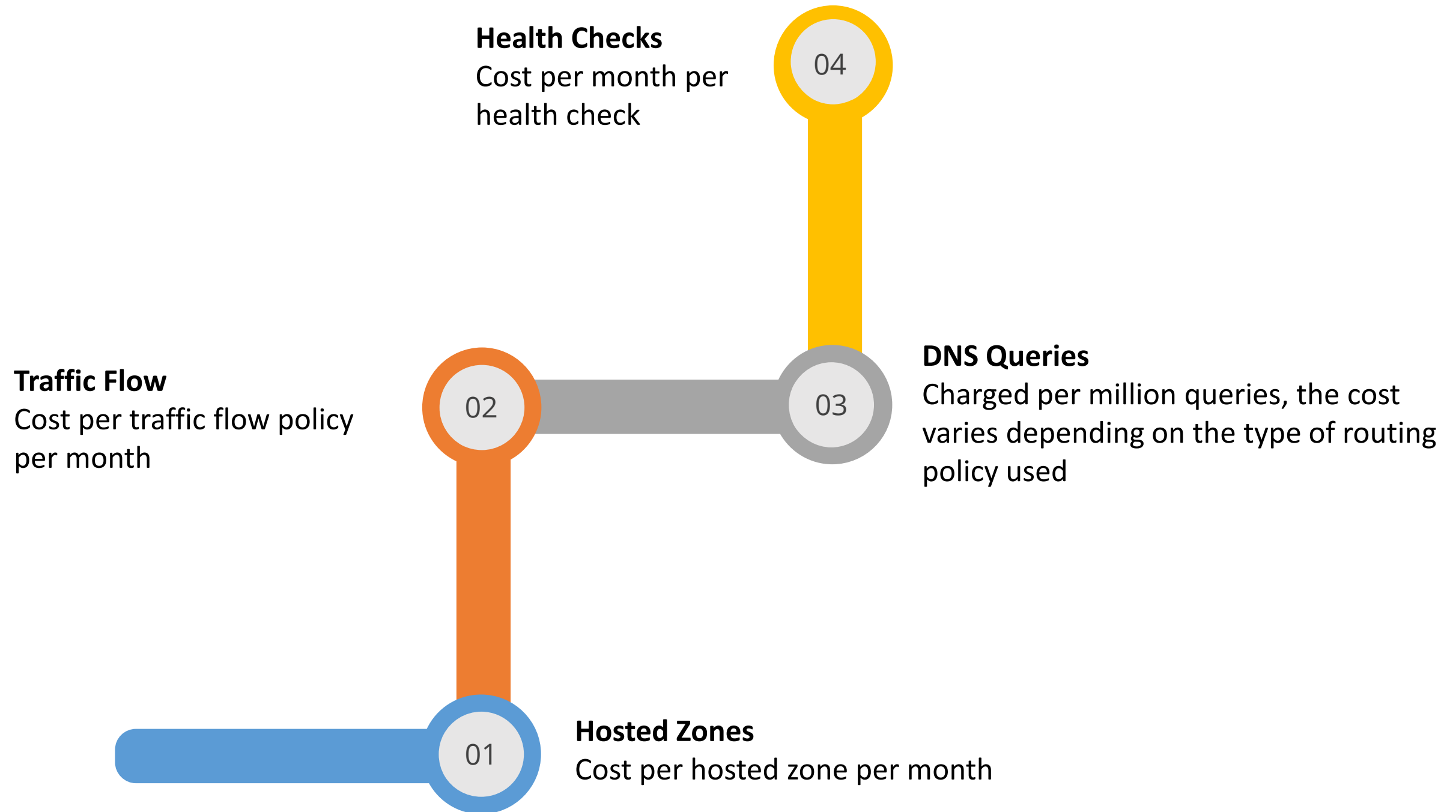
1. Use latency or Geolocation routing policies to provide users with the best response times.
2. Use health checks to ensure users are rerouted to healthy instances during an outage.

Amazon Route 53 Costs

Details about costs associated with Amazon Route 53

Route 53 Costs Overview

The diagram presents an overview of the costs associated with Route 53:





Practice Assignment: Amazon Route 53 Hosted Zone

Configure Route 53 to manage your Domain Name using a Hosted Zone

Configure Route 53 Hosted Zone



Your company wants to use Amazon Route 53 to manage its website.

You will need to perform the following steps:

1. Set up an EC2 instance as the webserver.
2. Configure an ELB to manage traffic to the webserver.
3. Configure a Route 53 Hosted Zone to manage your Domain Name.

BONUS: You can refer to the demonstration of this lesson as a reference for this Practice Assignment.

Key Takeaways

Key Takeaways

1. Route 53 provides Domain Name System services that provide a domain name to IP address mapping.
2. Alias Record is similar to a CNAME, however, it's used to map DNS names to ELB, S3 buckets, and CloudFront distributions within your hosted zone.
3. A routing policy determines how Amazon Route 53 responds to queries. There are five types of routing policies: Simple, Weighted, Latency, Failover, and Geolocation.



This concludes “Amazon Route 53.”

The next lesson is “Databases.”