AWS Certified Developer Associate

Lesson 11: Route 53

What You'll Learn

- Describe the basic concepts of Route 53
- Compare Public and Private Hosted Zones
- Define Resource Record Sets
- Identify Various Routing Policies
- Describe Health Checks
- Describe DNS Failover Configuration Procedure

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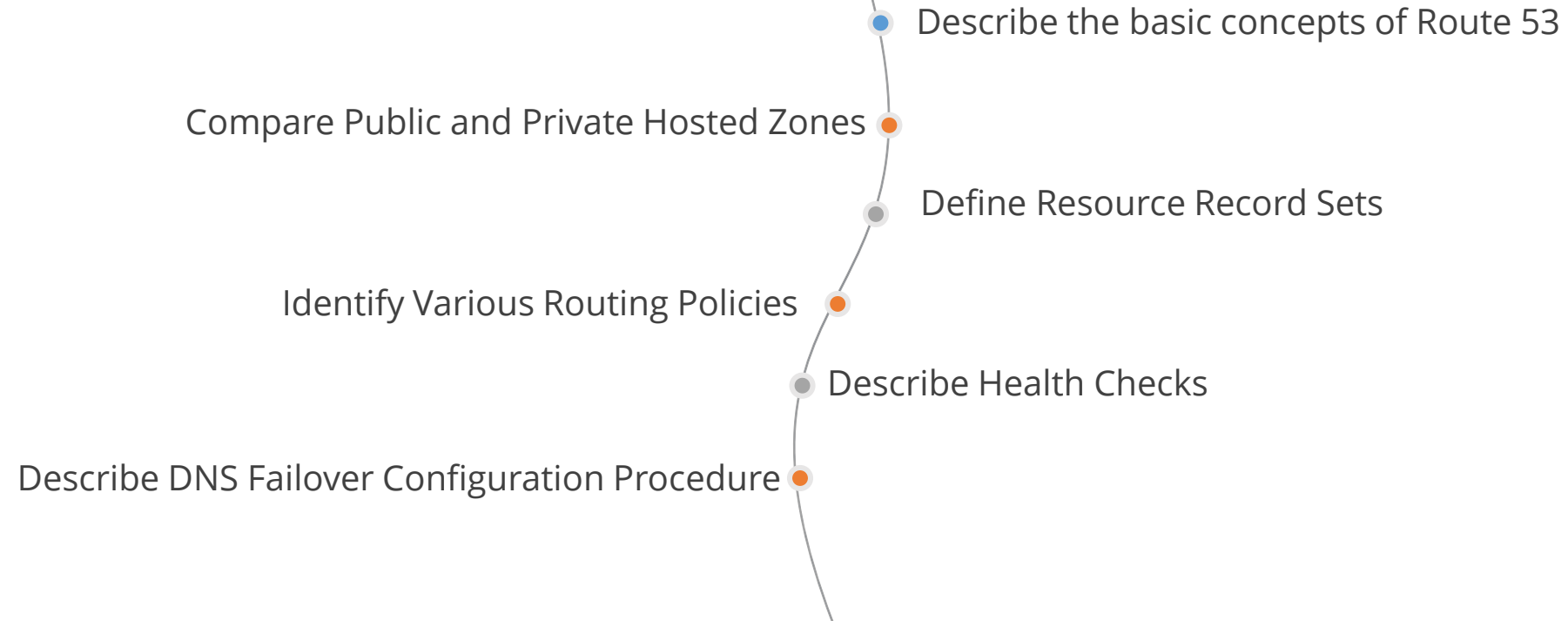
Basic Concepts of Route 53

Route 53 Overview

Highly scalable and available cloud Domain Name System (DNS) service

Responds to queries on port 53

Supports Domain Registration, Domain Name System Service, and Health Checking

Creates and manages domain names

Translates domain names into IP addresses

Health check features check application availability

Public vs Private Hosted Zone

Public Hosted Zone

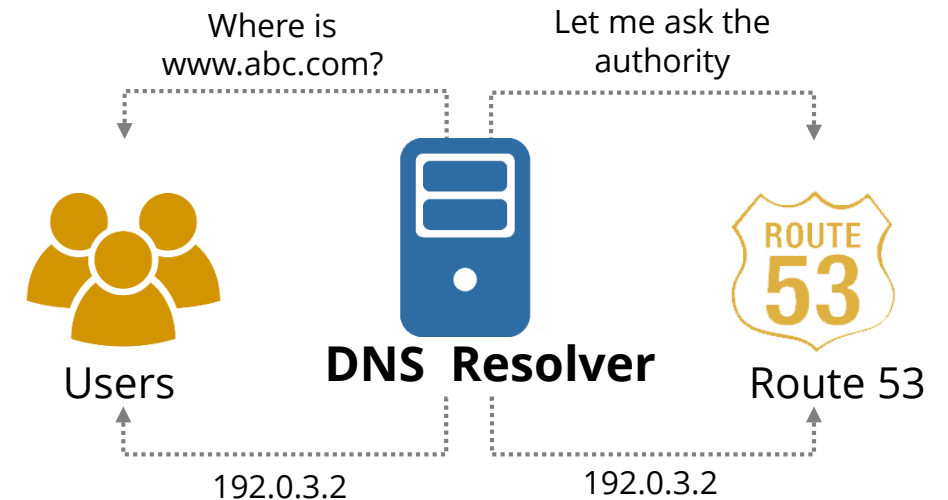> Stores information regarding the routing of traffic from internet to domain

> Requires resource record sets to handle queries coming to parent or subdomain

> Provides name server (NS) resource record set and a star of authority (SOA) resource record set

Private Hosted Zone

> Stores information regarding the routing of traffic from one or more amazon VPCs to a domain

> Allows users to associate Route 53 health checks only with failover resource record sets

Where is www.abc.com?

Let me ask the authority

Users

DNS Resolver

Route 53

192.0.3.2

192.0.3.2

ROUTE 53

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Resource Record Sets

Each Resource Record includes:
- Name of domain/subdomain
- Record type

CNAME record points one domain to another canonical domain.

DNS protocol does not allow the use of CNAME record for top level domain or zone apex

| Record Set Name | ✕ | Any Type ▾ | ☐ Aliases Only | ☐ Weighted Only |

Displaying 1 to 7 out of 7 Record Sets

☐	Name	Type	Value	TTL
☐	example.com.	NS	ns-XXXX.awsdns-XX.net. ns-XXXX.awsdns-XX.org. ns-XXXX.awsdns-XX.co.uk. ns-XXXX.awsdns-XX.com.	172800
☐	example.com.	SOA	ns-XXXX.awsdns-XX.org. awsdns-hostmaster.amazon.com.	900
☐	_text_.example.com.	TXT	"_text_example.com." "example.com." "cname.example.com." "www.example.com." "subdomain.example.com." "mailserver1.example.com."	300
☐	cname.example.com.	CNAME	www.exampledom.com	300
☐	mailserver1.example.com.	MX	10 inbound-smtp.mailserver1.example.com.	300
☐	subdomain.example.com.	NS	ns2.dnsprovider1.com ns1.dnsprovider1.com	300
☐	www.example.com.	A	192.168.1.100	300

Resource Record Sets Contd.

Alias resource record helps to route DNS queries to a CloudFront, ELB, or S3 bucket

Aliases allow the creation of an alias for the zone apex

Mail Exchange (MX) records direct an email to the servers based on owner's preference

TXT Records provide or store text information that can be used when necessary

Name server (NS) records identify servers that communicate DNS information

SOA records contain the information about DNS zone

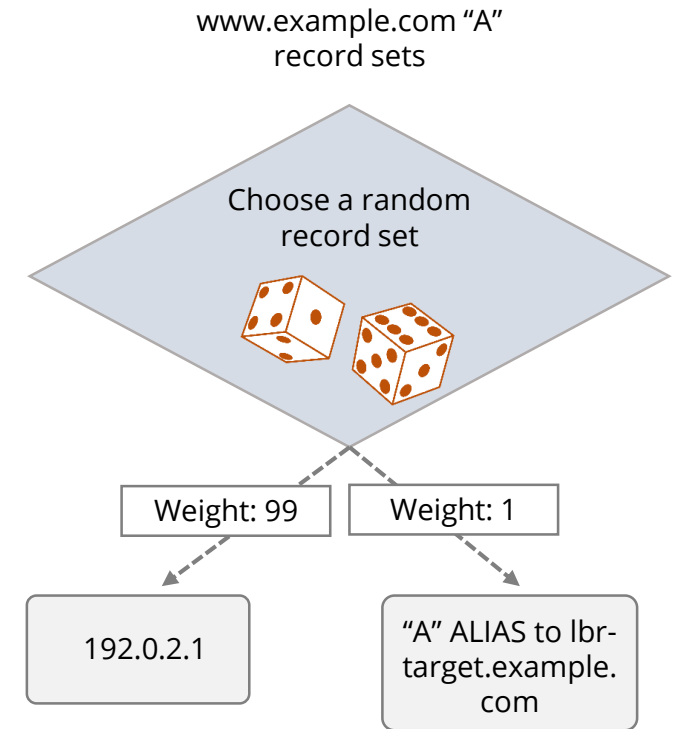Reverse-lookup pointer records look up domain names based on an IP address

Routing Policies

Simple Routing Policy is used when you have only one resource to serve incoming traffic

1 2 3 4 5 6

Routing Policies

Weighted Routing Policy is used when you have multiple resources doing the same work.

www.example.com "A" record sets

Choose a random record set

Weight: 99

Weight: 1

192.0.2.1

"A" ALIAS to lbr-target.example.com

1   **2**   3   4   5   6

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Routing Policies

Latency Routing Policy Responds to DNS queries with resources that provide the best latency

User(India)

Request from US user routed to Oregon region

VPC

EC2 Instance

Virtual private Cloud (Oregon)

Amazon Route 53

User(US region)

Request from India routed to Singapore region

VPC

EC2 Instance

Virtual private Cloud (Singapore)
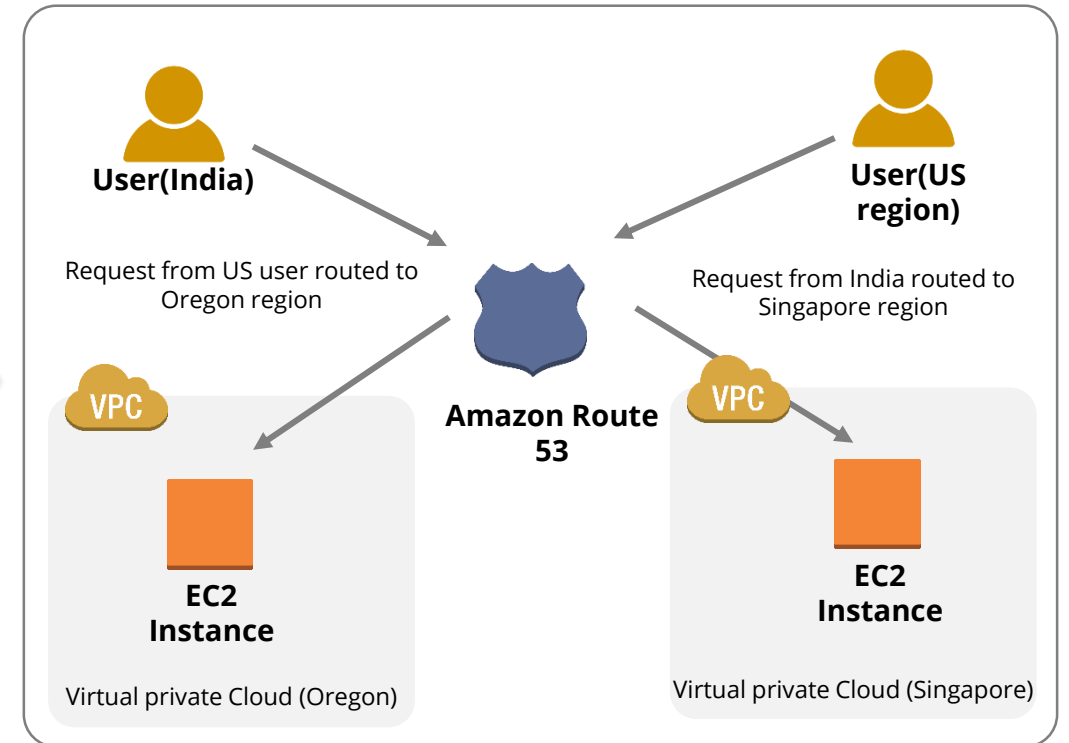
1   2   **3**   4   5   6
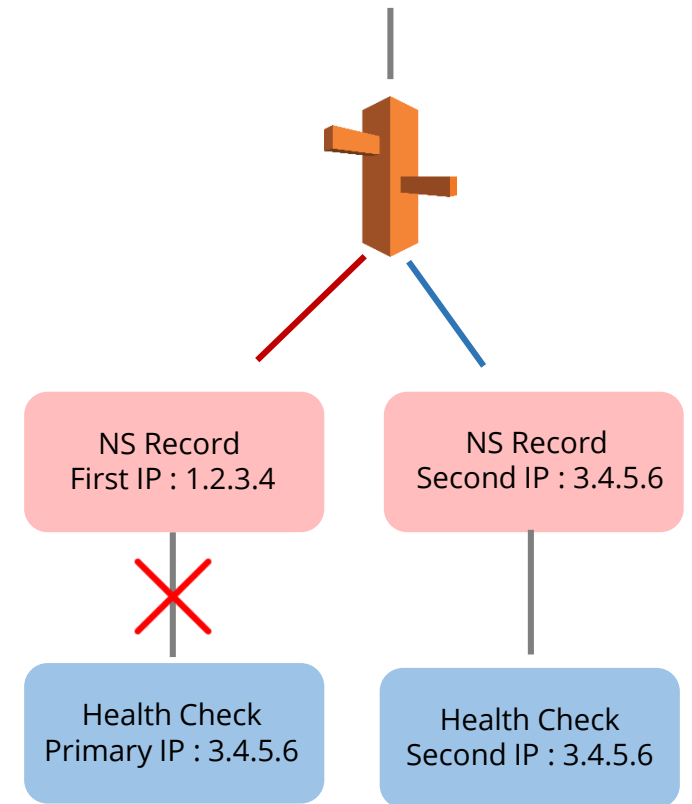
Routing Policies

Failover Routing Policy routes to resources that are healthy and reachable from outside

www.testweb.com

NS Record First IP : 1.2.3.4	NS Record Second IP : 3.4.5.6

Health Check Primary IP : 3.4.5.6	Health Check Second IP : 3.4.5.6

1 2 3 **4** 5 6

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Routing Policies

Geolocation Routing Policy is used when you want to balance load by directing requests to specified endpoints.

1   2   3   4   **5**   6

Routing Policies

Multivalue routing policy helps create multiple records with associated health checks. It routes your request to any one of the available, least busy, and healthy resources.

It's not a substitute for load balancer but balances requests at DNS level.

1   2   3   4   5   **6**

Route 53 – Health Checks

- Manages health checks while routing traffic

- Sends requests to verify the health of an application prior to routing

- Can be configured to monitor an end point or rely on other health checks

- Can be configured to perform calculated health checks based on other health checks

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Monitoring Other Health Checks

Three calculations Amazon Route 53 performs:

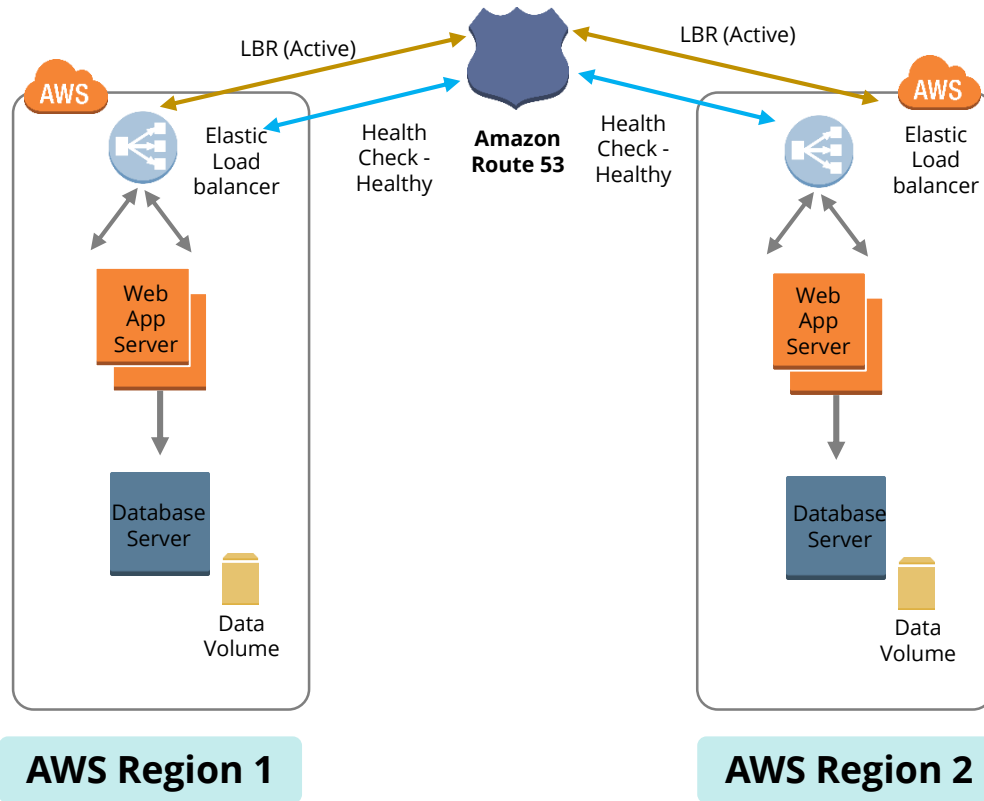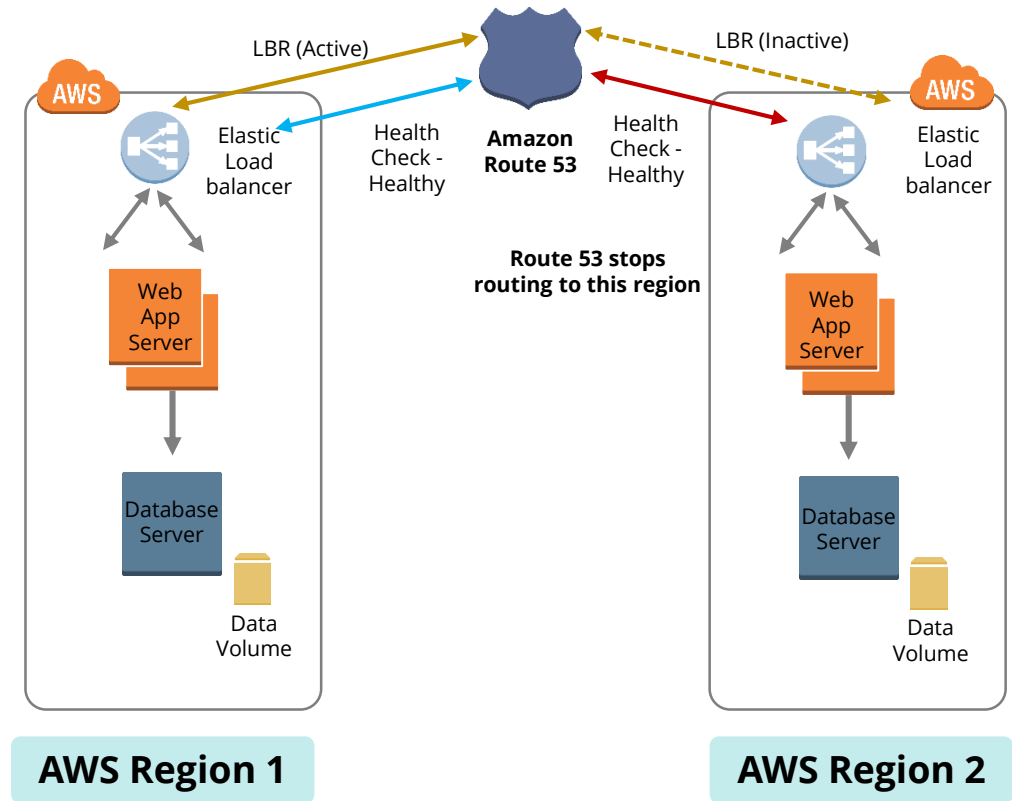**X number of health checks are healthy**

All health checks are healthy

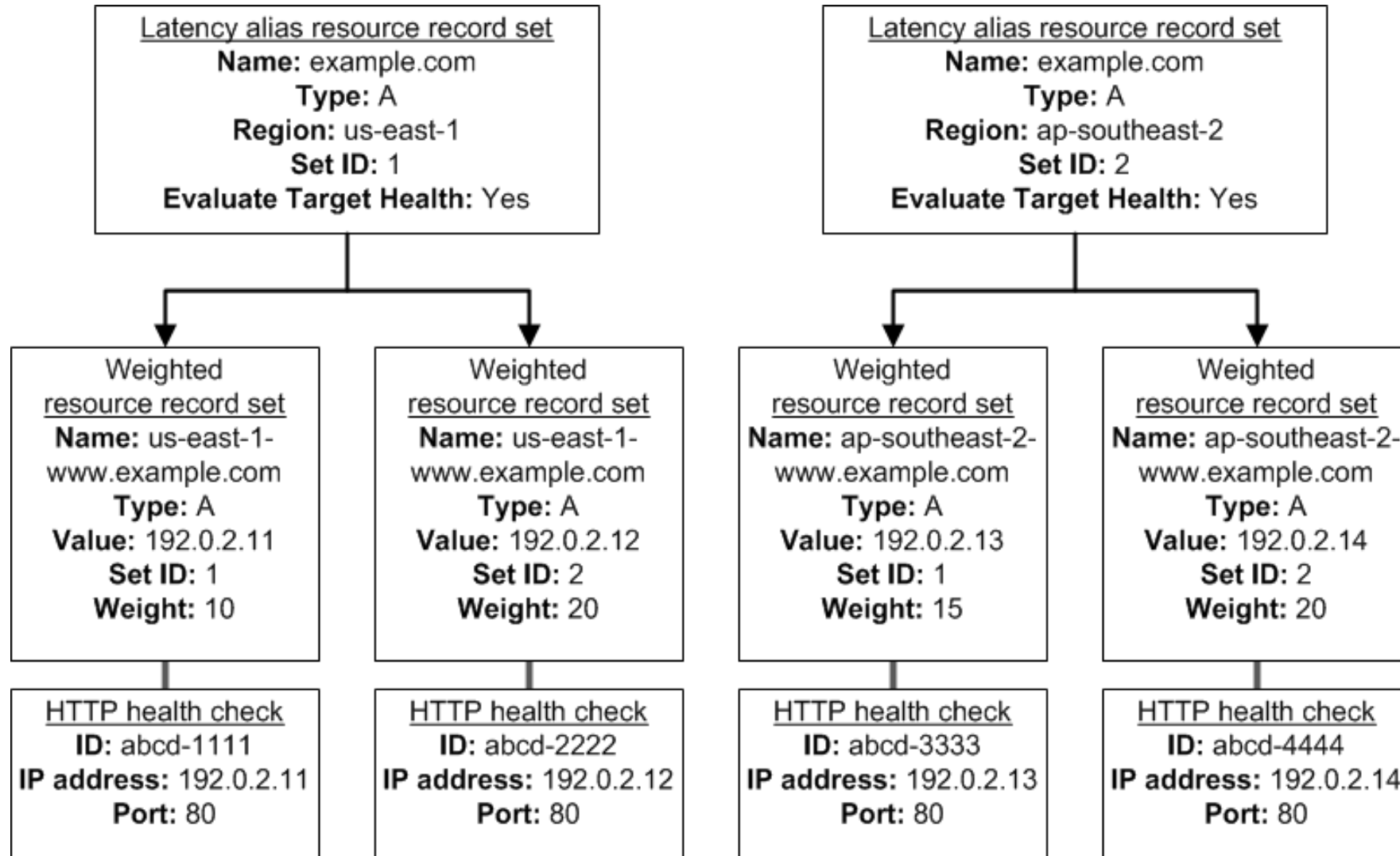**One or more health checks are healthy**

Configuring DNS Failover

Active-Active Failover

Active-Passive Failover

Configuring DNS Failover Contd.

Latency alias resource record set
Name: example.com
Type: A
Region: us-east-1
Set ID: 1
Evaluate Target Health: Yes

Latency alias resource record set
Name: example.com
Type: A
Region: ap-southeast-2
Set ID: 2
Evaluate Target Health: Yes

Weighted resource record set
Name: us-east-1-www.example.com
Type: A
Value: 192.0.2.11
Set ID: 1
Weight: 10

Weighted resource record set
Name: us-east-1-www.example.com
Type: A
Value: 192.0.2.12
Set ID: 2
Weight: 20

Weighted resource record set
Name: ap-southeast-2-www.example.com
Type: A
Value: 192.0.2.13
Set ID: 1
Weight: 15

Weighted resource record set
Name: ap-southeast-2-www.example.com
Type: A
Value: 192.0.2.14
Set ID: 2
Weight: 20

HTTP health check
ID: abcd-1111
IP address: 192.0.2.11
Port: 80

HTTP health check
ID: abcd-2222
IP address: 192.0.2.12
Port: 80

HTTP health check
ID: abcd-3333
IP address: 192.0.2.13
Port: 80

HTTP health check
ID: abcd-4444
IP address: 192.0.2.14
Port: 80

Knowledge Check

What are the two valid routing policies? (Choose 2)

a.   Latency

b.   Weighted

c.   Complex

d.   Passover

What are the two valid routing policies? (Choose 2)

a. Latency

b. Weighted

c. Complex

d. Passover

The correct answers are **Latency & Weighted**

Explanation: Weighted Routing policy is used when you have multiple resources doing the same work. Latency routing policy is used when you have a set of resources located in different AWS data centers doing the same work, and you want route 53 to respond to DNS queries with the resources that provide the best latency.

Practice Assignment: Routing traffic to reduce latency

Routing to lowest-latency AWS endpoint using **Route 53**

Use Route 53 to reduce the latency time

You're working for a commercial bank. A large number of users are coming to your bank to open an account as your bank is offering low interest rates on loans. This has resulted in high traffic, and it's causing high latency time for some users. How can you reduce the latency time by creating two weighted alias resource record sets?

Prerequisites:

- DNS name www.exact.com is hosted on US west region.
- Has instance and has an Elastic IP address w.w.w.w

Task:

Combine weighted and latency resource record sets to slowly migrate from standard routing to latency-based routing by having full control and rollback capability at each stage.

Quiz

QUIZ

1

Which of the following is NOT the function of Route 53?

a. Domain Registrar

b. DNS Service

c. Content Delivery

d. Health Check

QUIZ 1	Which of the following is NOT the function of Route 53?

a. Domain Registrar

b. DNS Service

c. Content Delivery

d. Health Check

The correct answer is **Content Delivery**

Explanation: Route 53 supports three main functions: Domain registration, Domain Name System service, and health checking.

QUIZ 2	What is the difference between public and private hosted zone?

a. Public zone receives DNS requests from outside; private zone receives requests from VPCs.

b. Private zone receives DNS requests from outside; public zone receives requests from VPCs.

c. Public and private zones use different resource record sets.

d. Private zone does not support routing policies, but public zone does.

QUIZ 2	What is the difference between public vs private hosted zone?

a. Public zone receives DNS requests from outside; private zone receives requests from VPCs.

b. Private zone receives DNS requests from outside; public zone receives requests from VPCs.

c. Public and private zones use different resource record sets.

d. Private zone does not support routing policies, but public zone does.

The correct answer is **Public zone receives DNS requests from outside; private zone receives requests from VPCs.**

Explanation: The main difference between Public and Private hosted zone is the location from where you are receiving the traffic to your hosted domain. If it is from Internet, you use public zone; use private zone if it is from VPCs.

What is the main purpose of "A" record?

a.   Maps domain name to another subdomain name

b.   Redirects to different domain

c.   Maps domain name to IP address

d.   Stores domain-related information

QUIZ 3	What is the main purpose of "A" record?

a. Maps domain name to another subdomain name

b. Redirects to different domain

c. Maps domain name to IP address

d. Stores domain-related information

The correct answer is **Maps domain name to IP address**

Explanation: A record can be used to link 'naked' domain address. A record can only have the IP address of the domain/subdomain it needs to point out to as its value.

QUIZ 4

Which of the following record sets supports naked domain or zone apex?

a. CNAME

b. ALIAS

c. MX

d. TEXT

QUIZ **4**	Which of the following record sets supports naked domain or zone apex?

a. CNAME

b. ALIAS

c. MX

d. TEXT

The correct answer is **Alias**

Explanation: Route 53 supports a special resource record set called Alias. Alias resource record allows you to route queries to a CloudFront, an Elastic Load Balancer, or an Amazon S3 bucket. Aliases are similar in some ways to the CNAME resource record type; however, you can create an alias for the zone apex.

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QUIZ

5

One of your customers has a legal requirement; he or she wants to serve localized content based on users' geographical location. Which routing policy is appropriate here?

a. Weighted

b. Latency

c. Geolocation

d. Simple

QUIZ 5

One of your customers has a legal requirement; he or she wants to serve localized content based on users' geographical location. Which routing policy is appropriate here?

a. Weighted

b. Latency

c. Geolocation

d. Simple

The correct answer is **Geolocation**

Explanation: Geolocation routing policy is used when you want to balance the load by directing requests to specified endpoints depending on the geographic location of the original request. This makes it possible to localize content based on users' geographical location.

Key Takeaways

- S3 supports three main functions: Domain registration, Domain Name System service, and health checking

- A record can be used to link 'naked' domain address. A record can only have the IP address of the domain/subdomain it needs to point out to as its value.

- Latency routing policy is used when you have a set of resources located in different AWS data centers doing the same work

- Failover routing policy is used when you can route to resources that are healthy and reachable from the outside world

- Route 53 monitors endpoint for health checks; the endpoint can be IP address, domain names, protocols including HTTP and TCP, Port, Host Name, or Path

- You can set up a variety of failover configurations using Amazon Route 53: alias, weighted, latency, geolocation routing, and failover resource record sets

This concludes 'Route 53'.

The next lesson is 'AWS' SDKs.'