**1. What is Amazon Route 53?**

**Answer:** Amazon Route 53 is a **scalable and highly available DNS (Domain Name System) web service**.

* Features: Domain registration, DNS routing, health checking, and traffic management.

**2. What are the main functions of Route 53?**

**Answer:**

* **DNS service** – Maps domain names to IP addresses.
* **Domain Registration** – Register new domains.
* **Health Checks & Failover** – Monitor endpoints and route traffic accordingly.
* **Traffic Management** – Load balancing using routing policies.

**3. What are the types of Route 53 records?**

**Answer:**

* **A** – IPv4 address
* **AAAA** – IPv6 address
* **CNAME** – Alias to another domain
* **Alias** – Points to AWS resources (ELB, CloudFront, S3)
* **MX, TXT, NS, SRV, PTR** – Other DNS record types

**4. What is the difference between CNAME and Alias record?**

**Answer:**

* **CNAME:** Points to another domain name. Cannot be used at the root domain.
* **Alias:** AWS-specific; can point to AWS resources and used at root.

**5. How does Route 53 achieve high availability?**

**Answer:**

* Globally distributed DNS servers.
* Anycast routing.
* Health checks with failover.

**6. What is a Hosted Zone in Route 53?**

**Answer:** A container that holds DNS records for a domain.

* **Public Hosted Zone:** Accessible from the internet.
* **Private Hosted Zone:** Accessible only within a VPC.

**7. What are Route 53 Health Checks?**

**Answer:** They monitor the health of resources (EC2, ELB, etc.) and route traffic away from unhealthy endpoints.

**8. Can Route 53 register domain names?**

**Answer:** Yes, Route 53 supports domain registration for many TLDs.

**9. How is Route 53 integrated with other AWS services?**

**Answer:** It works seamlessly with **CloudFront**, **S3 static websites**, **ALB/ELB**, and **API Gateway** for DNS resolution.

**10. Does Route 53 support DNSSEC?**

**Answer:** Yes. DNSSEC can be enabled for **domain registration** and **DNS query signing**.

**11. What are the types of routing policies in Route 53?**

**Answer:**

* **Simple Routing** – Single record.
* **Weighted Routing** – Distribute traffic by percentage.
* **Latency-Based Routing** – Direct traffic to the lowest-latency region.
* **Failover Routing** – Route to standby if primary fails.
* **Geolocation Routing** – Based on user’s location.
* **Geoproximity Routing** – Based on proximity with traffic biasing.
* **Multi-Value Answer** – Similar to simple, but returns multiple IPs.

**12. Scenario: You have two servers, one primary and one backup. Which routing policy should you use?**

**Answer:** Use **Failover Routing Policy**.

**13. How does Latency-Based Routing work in Route 53?**

**Answer:** It routes traffic to the region with the **lowest latency** from the user’s location.

**14. What is Geolocation vs Geoproximity Routing?**

**Answer:**

* **Geolocation:** Routes based on the user’s **geographical location**.
* **Geoproximity:** Routes based on **resource location** and can bias traffic.

**15. Can you use Route 53 with on-prem servers?**

**Answer:** Yes, by creating DNS records pointing to on-premises IPs.

**16. What is Route 53 Resolver?**

**Answer:** A service that enables **DNS queries between on-premises networks and AWS VPCs** (hybrid DNS).

**17. Can Route 53 load balance traffic?**

**Answer:** Yes, using **weighted** or **multi-value answer** routing (not a full load balancer but DNS-based).

**18. What is the TTL (Time to Live) in Route 53?**

**Answer:** TTL defines how long a DNS resolver caches a DNS record.

**19. What happens if all endpoints fail health checks?**

**Answer:** Route 53 **stops returning any IP addresses** for that record, effectively taking the service offline.

**20. How to ensure zero downtime when switching domains in Route 53?**

**Answer:**

* Use **low TTL** during migration.
* Configure new records ahead of time.
* Test before switching.

**21. Scenario: You want to route traffic to different endpoints based on user’s continent.**

**Answer:** Use **Geolocation Routing**.

**22. Scenario: You want to split traffic 70%-30% between two environments.**

**Answer:** Use **Weighted Routing Policy**.

**23. Scenario: Need to migrate users from one region to another gradually.**

**Answer:** Use **Weighted Routing** and adjust weights over time.

**24. How do you achieve Active-Active failover in Route 53?**

**Answer:**

* Use **Multi-Value Answer** with health checks.
* Or **Weighted Routing** with health checks.

**25. Scenario: You have an application deployed in multiple AWS regions and want to direct users to the region with the lowest latency.**

**Answer:** Use **Latency-Based Routing**.

**26. How does Route 53 handle DNS propagation?**

**Answer:** Propagation is instant within AWS, but **depends on TTL** for external DNS resolvers.

**27. Scenario: Users in the EU must connect to EU servers only (due to compliance).**

**Answer:** Use **Geolocation Routing** to restrict access.

**28. What is Route 53 Traffic Flow?**

**Answer:** A visual tool to configure advanced routing policies using a **traffic policy document**.

**29. Can Route 53 integrate with CloudFront for CDN?**

**Answer:** Yes. Create an **Alias record** pointing to the CloudFront distribution.

**30. Scenario: You need DNS resolution for private AWS services inside VPC only.**

**Answer:** Use **Private Hosted Zones**.

**31. Scenario: You need to resolve on-prem DNS names from AWS VPC.**

**Answer:** Use **Route 53 Resolver with inbound endpoints**.

**32. Scenario: You need to resolve AWS private hosted zone DNS names from on-prem.**

**Answer:** Use **Route 53 Resolver with outbound endpoints**.

**33. Can Route 53 provide DDoS protection?**

**Answer:** Yes, as part of **AWS Shield Standard**, DNS-level DDoS mitigation is included.

**34. Scenario: Reduce DNS query costs while maintaining availability.**

**Answer:**

* Use **simple routing** (no health checks).
* Increase TTL where possible.

**35. How to force HTTPS redirection using Route 53?**

**Answer:** Route 53 cannot redirect HTTP→HTTPS.

* Use **CloudFront** or **ALB** to handle redirection.

**36. Scenario: You have overlapping private hosted zones across accounts. How to resolve?**

**Answer:** Use **Route 53 Resolver rules** or consolidate zones.

**37. What is Alias Target Evaluation in Route 53?**

**Answer:** Alias records allow Route 53 to **evaluate the health of AWS resources** (e.g., ELB) and return healthy endpoints.

**38. Scenario: Users in Asia are experiencing slow DNS resolution.**

**Answer:**

* Enable **Latency-Based Routing**.
* Use **CloudFront** with Route 53.

**39. How to enforce DNSSEC for a Route 53 hosted zone?**

**Answer:** Enable **DNSSEC signing** for the zone and configure the registrar with the DS record.

**40. Scenario: Need to failover between AWS and an on-prem site.**

**Answer:**

* Use **Failover Routing Policy** with health checks.
* Configure **secondary record** to point to on-prem IP.