**Route 53**

**DNS 101**

1. What is DNS (Domain Name System)?
2. IPV4 / IPV6 – (IPV6 => 128 bit / IPV4 => 32 bit, 4 Billion+)
3. Top Lever Domains
   1. .com/.edu/.org/
   2. Optional second level domain name - .co.uk, .gov.uk, etc.
   3. <https://developer.mozilla.org/en-US/docs/Glossary/Second-level_Domain> => For example, in mozilla.org the SLD is mozilla and the TLD is org.
4. **IANA** – Internet Assigned Numbers Authority => Controls **Top Level Domains** and **root DNS servers** (13 IP addresses)
5. **Domain Registrars** – Registered with **ICANN** (The Internet Corporation for Assigned Names and Numbers) to enforce uniqueness of the registered domains. Amazon is a domain registrar.
6. **Authoritative DNS servers** => The server to get the actual IP (Route 53 is an Authoritative DNS service)

**Common Record Types**

1. The SOA Record – Start of Authority
   1. The name of the server that supplied the data for the zone
   2. The administrator of the zone
   3. The current version of the data file
   4. The default number of seconds for the **TTL** file on resource records
2. NS Record – Where to find the server that has the information
3. A Record – Maps domain name -> IP
4. CNAME – Canonical Name => Redirect to the A record
5. Alias
   1. Similar to CNAME
   2. CNAME **cannot** be used for naked domain names (Zone apex record)
   3. Alias Record can
   4. On AWS, CNAME involve look up cost, but alias does not (Cheaper)
   5. Alias is AWS preferred Record over CNAME
6. MX Record – For Mail server
7. PTR Record – For reverse lookup => (Security (i.e To check a mail is indeed sent out from a server it claims to be) and debug purpose)

**Register a Domain**

1. You can buy domain names directly from AWS

**Route 53 Routing Policies**

1. Simple – Return the IPs in random order
2. Weighted – Route by weight
3. Failover – Active / Passive
4. Multi-valued Answer – Simple with health checks
5. Latency-based
6. Geolocation
7. Geo-proximity – Need to turn on Traffic Flow to work

Except simple, you can enable health checks (Either 10 or 30 seconds) on individual record set

1. If a record set fails the health check, it will be removed from the Route 53 until is passes the check
2. You can set SNS notifications to alert you if a health check fails

**Summary**

1. ELBs do not have pre-defined IPv4 addresses, you need to resolve them using a DNS name
2. Understand difference between Alias and CNAME. Alias is favored by AWS. Route 53 doesn't charge for alias queries to AWS resources, Route 53 charges for CNAME queries.
   1. Amazon Route 53 alias records provide a **Route 53–specific** extension to DNS functionality
   2. An alias record can only redirect queries to selected AWS resources, such as Amazon S3 buckets, CloudFront distributions, another record in the same Route 53 hosted zone
   3. A CNAME record can redirect DNS queries to any DNS record. For example, you can create a CNAME record that redirects queries from acme.example.com to zenith.example.com or to acme.example.org. You don't need to use Route 53 as the DNS service for the domain that you're redirecting queries to
3. <https://docs.aws.amazon.com/Route53/latest/DeveloperGuide/resource-record-sets-choosing-alias-non-alias.html>