Assignment-3

1. **What is the purpose of route 53 and significance of DNS in the context of Route 53?**

Route 53 is a scalable and highly available Domain Name System(DNS) web service provide by AWS. Its main purpose is to translate human readable domain names (like [www.example.com](http://www.example.com)) into numerical IP addresses that computers use to identify each other on the internet.

Here’s the significance of DNS in the context of Route 53:

1. Domain Name Resolution: DNS is crucial for resolving domain names to their corresponding IP addresses. When a user enters a domain name into their web browser, the browser queries DNS servers to find the IP address associated with that domain. Route 53 manages this process for the domains hosted on AWS.
2. Load Balancing: Route 53 offers various routing policies that allow you to distribute traffic across multiple resources. For example, you can use it to route traffic to different endpoints based on geographic location, latency or weighted distribution. This is significant for distributing incoming traffic efficiently across your infrastructure.
3. High Availability: Route 53 is designed for high availability and reliability. It uses a globally distributed network of DNS servers to ensure that domain name resolution remains fast and reliable, even in the event of failures or traffic spikes.
4. Health Checks: Route 53 can monitor the health of your endpoints and automatically adjust DNS routing based on their availability. This feature is Significant for enduring that traffic is only routed to healthy resources, improving the overall reliability and availability of your applications.
5. DNS Failover: Route 53 supports DNS failover, allowing you to configure backup resources that are automatically used if the primary resources become unavailable. This is significant for building fault-tolerant architectures that can withstand failures without impacting the end user experience.

Overall, Route 53 plays a crucial role in managing DNS and routing traffic for applications and services hosted on AWS, providing scalability, reliability, and flexibility for your infrastructure.

**2. What is Amazon Cloud Front, and what problem does it solve?**

Amazon CloudFront is a content delivery network(CDN) service provided by AWS. Its primary function is to deliver content, such as web pages, videos, images, and other static and dynamic assets, to users with low latency and high transfer speeds. CloudFront achieves this by caching content at edge locations distributed around the world, bringing content closer to users and reducing the distance data needs to travel.

Here's how CloudFront solves several common problems:

1. Reduced latency: By caching content at edge locations close to end users, CloudFront reduces the time it takes for users to access content. This results in lower latency and faster load times for web pages, videos, and other assets, improving the overall user experience.
2. Scalability: CloudFront automatically scales to handle large volumes of traffic, allowing websites and applications to accommodate spikes in demand without experiencing performance issues or downtime. This scalability is essential for handling traffic surges during events like product launches, promotions or breaking news.
3. Global Reach: CloudFront’s network of edge locations spans across multiple continents, ensuring that content is delivered quickly and reliably to users worldwide. This goal reach is significant for business and organizations that have a global audience and need to deliver content efficiently to users in different regions.
4. Security: CloudFront provides various security features, such as HTTPS support , field-level encryption, and integration with AWS Web Application Firewall(WAF), to protect content and applications from security threats, such as unauthorized access, data breaches, and DDoS attacks.
5. Cost- Effectiveness: CloudFront offers pay as you go pricing with no upfront fees or long term commitments. This cost effective pricing model allows businesses to only pay for the resources they use, making it suitable for a wide range of applications and workloads.

Overall, Amazon CloudFront solves the problem of delivering content quickly, reliably, and securely to users around the world, making it an essential component of modern web applications, websites, and digital content delivery strategies.

**3. Explain the concept of “server less” computing in the context of AWS? Lambda?**

Serverless computing, particularly in the context of AWS Lambda, represents a paradigm shift in how applications are built and deployed in the cloud. Here’s an explanation:

1. Traditional Server-Based model: In traditional server-based computing, developers need to provision and manage servers to run their applications. They have to consider factors like server capacity, scalability, maintenance, and infrastructure management. This approach often requires predicting and provisioning for peak loads, which can result in underutilized resources and increased operational overhead.
2. Serverless Computing: Serverless computing abstracts away the underlying infrastructure, allowing developers to focus solely on writing code to implement their application logic. With serverless, developers do not need to manage servers or worry about infrastructure provisioning, scaling, or maintenance. Instead, they can upload their code to a serverless platform, such as AWS Lambda, and the platform automatically handles the execution of that code in response to events.
3. AWS Lambda: AWS Lambda is a serverless compute service provided by AWS. It allows developers to run code in response to events without provisioning or managing servers. Developers can upload their code to Lambda, define the events that trigger the code execution (e.g HTTP requests, database changes, file uploads), and Lambda automatically scales the infrastructure to handle the incoming requests.
4. Event- Driven Architecture: Serverless computing, including AWS Lambda, is well-suited for event driven architectures, where code is executed in response to events or triggers. Events can come from various sources, such as HTTP requests, database changes, file uploads, message queues and more. Lambda functions are designed to be stateless and ephemeral, meaning they are short lived and only run when triggered by an event.
5. Pay Per Use Billing Model: One of the key benefits of serverless computing is its pay per use billing model. With AWS Lambda, developers only pay for the compute time consumed by their functions, measured in milliseconds. There are no upfront fees or minimum charges, making it cost effective, especially for applications with unpredictable or sporadic workloads.

Overall, serverless computing, exemplified by AWS Lambda, abstracts away infrastructure management, enables event driven architecture, and provides a pay per use billing model , allowing developers to focus on writing code and building applications without the overhead of managing servers.