AWS Architecture Design – Assignment #2

-by Sivakumar P, Software Trainee at Tringapps.

Given:

Application type : LAMP stack.

Solution:

1. Scaling to meet the demand : (Service : <u>AWS Autoscaling</u>)

> AWS Auto Scaling monitors our applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost.

2. Disaster Recovery : (Service : <u>Hot Standby</u>)

- At Disaster Recovery in AWS, Hot Standby method can be followed because here one system runs simultaneously with another primary system.
- So when failure happens on the primary node, the hot standby immediately takes over replacing the primary system.

3. Database and data access layer for high performance and throughput :
(Service : <u>AWS Aurora for database and AWS ElastiCache for Redis</u>)

- AWS Aurora is MySQL and PostgreSQL compatible cloud service and it serverless which scales upto 64Tb
- 5x performance improvement over MySQL and self healing with peer to peer replication which exactly suits the constraint

- Since LAMP uses MySQL as its database and it is not a key value pair based(NoSQL) database, Redis ElastiCache is used in the data access layer.

4. UX with very low latency though user will be far away :(Service : AWS Cloudfront CDN)

- CloudFront delivers your content through a worldwide network of data centers called edge locations.
- When a user requests content that we are serving with CloudFront, the request is routed to the edge location that provides the lowest latency (time delay), so that content is delivered with the best possible performance.

5. Effective distribution of load : (Service : AWS Application Load Balancer (ALB))

- Since it is an LAMP stack, Application Load Balancer makes routing decisions at the application layer (HTTP/HTTPS), supports path-based routing, and can route requests to one or more ports on each container instance in our cluster.
- The dynamic mapping allows you to have multiple tasks from a single service on the same container instance.

6. Self-healing infrastructure : (Service : AWS Autohealing)

An instance can be a member of multiple layers. If any of those layers has auto healing disabled, AWS OpsWorks Stacks does not heal the instance if it fails.

7. Security of data at rest and in transit : (Service : AWS KMS, HSM & ACM)

- Key Management Service used to encrypt data on the customer's behalf

- Hardware security module usd for security at Hardware Level.
- Also in this proposed architecture we have used AWS Security groups. We can also use Network ACL, and VPN for security reasons.

8. Securing access to the environment as the delivery team expands :
(Service : Identity Access Module(IAM))

- With IAM, we can specify who can access which services and resources, and under which conditions.
- With IAM policies, we can manage permissions to our workforce and systems to ensure least-privilege permissions.

9. An archival strategy for inactive objects greater than 6 months : (Service : AWS Glacier)

- The Amazon S3 Glacier storage classes are purpose-built for data archiving, providing us with the highest performance, most retrieval flexibility, and the lowest cost archive storage in the cloud.
- This can be used for the archival objects greater than 6 months.

10. Ability to easily manage and replicate multiple environments based on their blueprint architecture. (Service : AWS CloudWatch, AWS CloudFormation)

- Use CloudWatch alarms to send repeated notifications.
- This architecture with AWS services can be converted into scripts/code in the form of CloudFormation templates and these templates can then be easily used to replicate environments.

Architecture flow can be expressed as below,

Architectural diagram

SIVAKUMAR P
SOFTWARE TRAINEE.

O/P   I/P

| USER | | OFFICE |

| INTERNET | | CLOUD FORMATION | | CLOUD WATCH | | CDN | | IAM. |

AUTO HEALING

AWS

INTERNET GATE

| AWS HOT STANDBY | runs on disaster

INTERNET GATE

VPC
AZ-A   AZ-B

| PUBLIC SUBNET | | PUBLIC SUBNET |

NAT GATE

| ALB |

| PRIVATE SUBNET | | PRIVATE SUBNET |

| EC2 with SECURITY GROUP | | EC2 with SECURITY GROUP |

| Autoscaling Connect |

| AWS AURORA | | AWS AURORA |

VPC
AZ-A   AZ-B

| PUBLIC SUBNET | | PUBLIC SUBNET |

NAT GATE

| ALB |

| PRIVATE SUBNET | | PRIVATE SUBNET |

| EC2 with SECURITY GROUP | | EC2 with SECURITY GROUP |

| Autoscaling connect |

| AWS AURORA | | AWS AURORA |

INTERNET GATE

SECONDARY   → PRIMARY

| AWS Glacier | | S3 Backup |

| AWS Glacier | | S3 Backup |

| REDIS CACHE with Safety Group | | REDIS CACHE with Safety Group. |