Lab - 6.

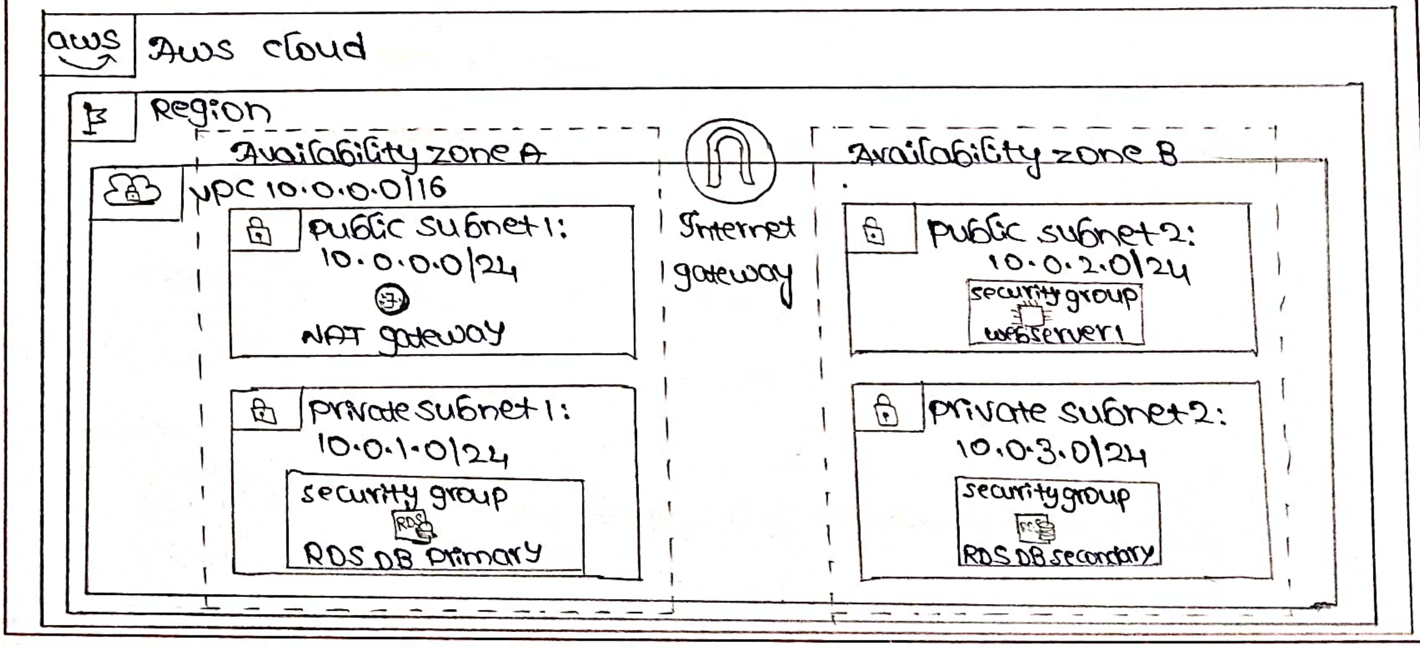
Aim:: To scale and load balance the Architecture.

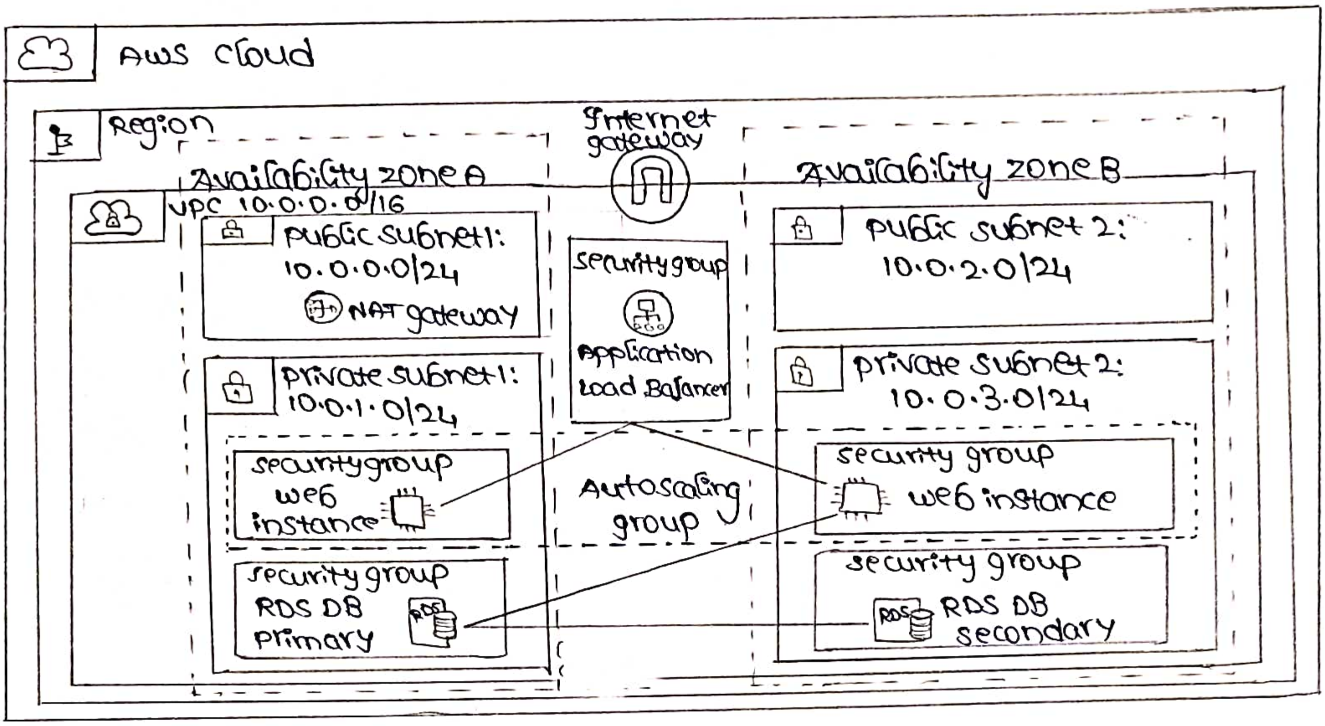
Description:

Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances. It enables you to acheive fault tolerance in our applications by seamlessly providing the required amount of load balancing capacity needed to route application traffic.

Auto scaling helps to maintain application availability and allows to scale our amazon EC2 capacity out or in automaticaly according to conditions you define. we can use Auto scaling to help ensure that we are running our desired number of Amazon EC2 instances.

Architecture:




AWS cloud
Region
Internet gateway
Availability zone A
Availability zone B
VPC 10.0.0.0/16
public subnet1: 10.0.0.0/24
NAT gateway
public subnet 2: 10.0.2.0/24
security group
Application Load Balancer
private subnet1: 10.0.1.0/24
private subnet 2: 10.0.3.0/24
security group web instance
Autoscaling group
security group web instance
security group RDS DB Primary
security group RDS DB secondary
RDS
RDS

steps followed for scale and load balance the architecture:

* choose Start Lab to launch our lab.

* wait until we see the message "lab status: In creation".

* choose AWS.

Task-1: create an AMI for Auto scaling:

* In AWS management console, in search box, next to services and select EC2.

* In navigation pane, choose Instances.

* wait until the status check for webserver1

* select ☑ web server1.

* In Action ▾ menu, chose Image and templates > Create image,
  - Image name: webserverAMI
  - Image description: lab AMI for web server.

* Choose create Image

Task 2:- Create a Load Balancer:-

* In navigation pane, choose Target Groups.
  - choose create target group
  - Choose a target type: Instances
  - Target group name, enter: LabGroup.
  - select lab vpc from the vpc drop-down menu.
* Choose next. The Register targets screen appears.
* Review the settings and choose create target group.
* In navigation pane, choose Load Balancers.
* choose create load balancer.
* under Application Load Balancer, choose create.
* under Load balancer name, enter: LabELB.
* choose Network mapping section, then:
  - For vpc, choose lab vpc.
  - Choose pubnel public subnet 1
  - choose public subnet 2
* In security groups section:-
  - select ☑ web security group
  - choose X next to default security group to remove it
* For Listener HTTP:80 row, set the default action.
* choose create lab balancer. The Load balancer is created
  - Choose view Load balancer.

Task3:- create a launch Template and an Auto scaling Group:

- In navigation pane, choose launch templates.
- choose create launch template
- configure the launch template settings and create it:
  - ○ launch template name: labconfig
  - ○ select auto scaling guidance
  - ○ In application and os images area, choose my AMIs.
  - ○ Amazon machine image (AMI): choose web server AMI
  - ○ Instance type: choose t2.micro
  - ○ keep pair name: choose vockey
  - ○ Firewall (security groups): choose select existing security group
  - ○ security groups: choose ☑ web security Group
  - ○ scroll to advanced details are and expand it.
  - ○ scroll to detailed cloudwatch monitoring setting. select ☑ Enable
  - ○ choose create launch template
- choose the labconfig launch template.
- From the Actions ▾ menu, choose create Auto scaling group.
- configure the details in step 1.
  - ○ Auto scaling group name: lab Auto scaling Group.
  - ○ launch template: confirm that labconfig templete.
  - ○ choose Next
- configure the details in step 2.
  - ○ VPC: choose lab vpc.

- Availability zones and subnets: choose private subnet1 and then choose private subnet 2.
- choose $\boxed{\text{next}}$

* configure the details in step3:.

- choose Attach to an existing load balancer.
  - Existing load balancer target groups: select labGroup.
- In the Additional settings pane:
  - select ☑ Enable group metrics collection within cloudwatch.
- choose $\boxed{\text{next}}$

* configure the details in step4:

- under Group size, configure:
  - Desired capacity: 2
  - Minimum capacity: 2
  - Maximum capacity: 6
- under scaling policies,
  - scaling policy name: labScalingpolicy
  - metric type: Average cpu utilization
  - Target value: 60
  - choose $\boxed{\text{next}}$

* configure the details in step 5:

- choose $\boxed{\text{next}}$

* configure the details in step6:

- choose Add tag and configure following:
  - key : Name
  - value: lab Instance.

- choose Next.

*configure the details in step-6:.

- choose create Auto scaling group.

Task 4: verify that load Balancing is working:.

* In navigation pane, choose Instances.
* In navigation pane, choose Target Groups.
* select ☑ Lab Group.
* choose the Targets tab.
* Wait until the status of both instances transitions to healthy.
* Choose the Load Balancers
* select ☑ LabELB load balancer.
* In details pane, copy the DNS name of load balancer.
* open a new web browser tab, paste the DNS Name you just copied and press Enter.

Task-5: Test Auto scaling:.

* Return to AWS management console, but do not close the application tab.
* In search box next to services and select cloudwatch.
* In navigation pane, choose All alarms.
  - on the services menu, choose EC2.
  - In navigation pane, choose Auto scaling groups.
  - select ☑ Lab Auto scaling group.
  - choose the Automatic scaling tab.

- select ☑ labscaling policy.
- choose Actions ▼ and Edit.
- change the Target value to 50.
- choose update
- on the services menu, choose cloudwatch.
- In navigation pane, choose All alarms.

* choose the ok alarm, which has high Alarm.

* Return to browser tab, with the web application.

* choose the load Test beside the AWS logo.

* Return to browser tab, with the cloudwatch console.

* wait until the AlarmHigh alarm enters the in alarm state.

* In services, and select EC2.

* In navigation pane, choose Instances.

Task - 6: Terminate web server 1:-

* select ☑ web server 1.

* In the Instance state ▼ menu, choose Instance state > Terminate Instance.

* choose Terminate.

* choose End lab and then choose yes to confirm that we want to end the lab.