**ELASTICITY**

* + Increasing and decreasing the capacity to meet increasing and decreasing work load
  + Elasticity is short term
  + Elasticity is also called as Horizontal Scaling
  + Elasticity can be achieved in AWS using Auto-Scaling (AG)
  + Auto-Scaling = Scale Out and Scale In

1. Scale Out : Adding/increasing servers(instances)
2. Scale In : Removing/decreasing servers(instances)

**SCLABILITY**

* Increasing the capacity of the server (i.e same machine) is called Scalability
* Scalability for long term
* Scalability = Scale Up and Scale Down
* Scalability is also called as Vertical Scaling
* Capacity means combination of both CPU + RAM

|  |
| --- |
| DB SERVER |

16 GB

8 GB

**HIGH AVAILABILITY:**

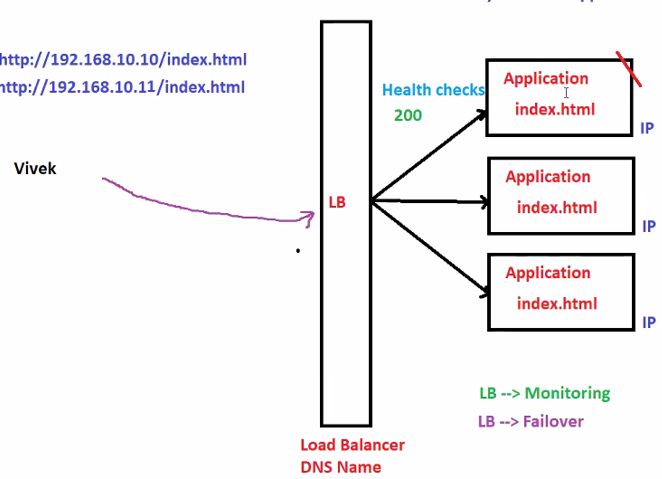
* The period of time service is available to the customer is called High Availability

**LOAD BALANCER:**

* Distribute the traffic to different server is called Loan Balancer (LB)
* Load balancer (LB) always monitor application not the server
* Redundancy: Keeping same application on different server
* Monitoring: Doing health check is called Monitoring (i.e LB will take care)
* Failover: One server goes down other server pick it up

**HIGH AVAILABILITY**

|  |
| --- |
| Redundancy  Monitoring  Failover |



Note: Customer is not interested to access his application using IP address, instead us LB DNS Name

**REGION:**

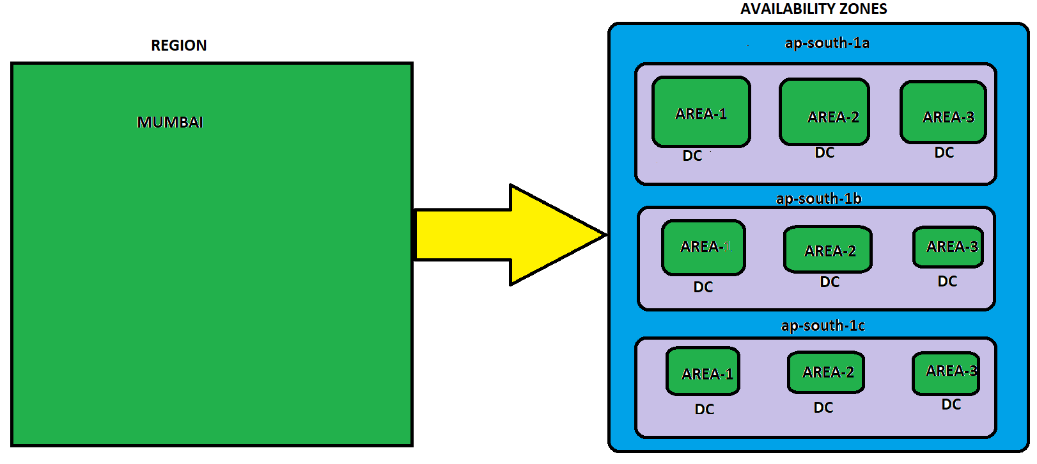
* Region is a geographical area

Example : Mumabai

* Region don’t communicate each other by default, if required yes.
* A region has multiple datacenters
* A region has multiple availability zones (AZ’s)

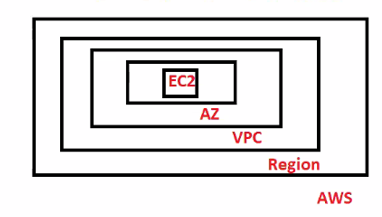
**AVAILABILITY ZONE:**

* Nothing but group of datacenters (DC)
* Availability zones (AZ’s) has instances/servers
* Availability zones(AZ’s) can communicate with each other
* Availability zones are sync with each other (i.e network) no the data
* Very less chance to that 1 AZ goes down
* Regions and Availability Zones (AZ’s) are managed by AWS



**VPC(Virtual Private Cloud)**

* VPC is reginal
* AWS will provide default VPC
* One region can have multiple VPC’s
* 2 VPC can’t talk to each other by default
* Per region we have 5 VPC’s by default
* It is like a virtual datacenter on cloud



**ELASTIC COMPUTE CLOUD (EC2)**

* In EC2 Service, we can launch EC2 instances
* EC2 is regional
* Service = Instance =EC Instance (VM)

**ELASTIC LOAD BALANCE:**

* ELB Distribute the traffic to multiple EC2 Instances across multiple AZ’s
* ELB is completely managed by AWS

(i.e HA, AS, Scalability, Performance etc)

* ELB is not a Server, it is a service for us
* We can’t login to ELB, but we can access ELB with DNS name
* ELB doesn’t have AZ’s,it is created at reginal level
* ELB is IAAS
* ELB has the IP address, these are dynamic
* AWS always recommended to use DNS name not ip address
* ELB has dynamic ip address, if you need static IP, contact AWS support center (but keep in mind we are compromising performance of ELB by getting static IP)

**TYPES OF LOAD BALANCER**

Application Load Balancer

* Latest Generation
* Default ELB
* We will use HTTP / HTTPS
* Best suitable for microservice

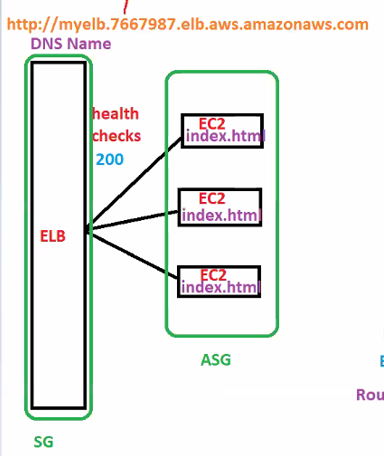
Network Load Balancer

* Latest Generation
* We will use for TCP
* Extreme high performance
* Will use static IP

Classic Load Balancer

* Previous Generation
* We will use HTTP, HTTPS and TCP

**New**Gateway Load Balancer



**ROUTING FEATURE**

* + Host based routing

Ex: https://www.suresh.com

* + Path based routing

Ex: https://www.suresh.com/admin

**LAMBDA:**

* Lambda is used for automation
* Lambda is Serverless
* Lambda is invoked based on the triggers

**SIMPLE STORAGE SERVER(S3)**

* In AWS, All services will start with SIMPLE and end with service.
* Ex: Simple Storage Service(S3)
* Simple Notification Service(SNS)
* S3 is unlimited storage from AWS
* S3 is used to store all FLAT file using S3 we can upload,download and access our files
* We can execute any files in S3
* Is it possible to install OS in S3? NO
* Is it possible to install DB in S3? NO
* Is it possible to run .net,java,.ext files ..etc in S3? NO
* S3 is serverless and AWS will handle HighAvailabilty,Performance,Scalability etc for S3
* S3 support Static Website Hosting (SWH)(HTML files)
  + Create bucket,upload all your files,enable satic website hosting
* **S3 is object based storage**
* S3 is GLOBAL and BUCKETS are reginal

**ELASTIC FILE SYSTEM:**

* By using this service, we can attach single volume to multiple EC2 instance at the same time across multiple AZ’s (*i.e same REGION*)
* EFS is unlimited storage
* EFS will launch only LINUX machine and completely managed by AWS
* EFS is serverless for us
* EFS works with NFSv4 Protocol
* EFS is ***FILEBASE*** storage
* EFS is file sharing purpose, we can install any software but not recommended
* EFS doesn’t require any pre-provisioning (i.e it will automatically increase and shrink based on the data you put on EFS)
* Same EFS can be mounted(attached) multiple EC2 instance

Example: Pen drive, separate(device) mount point

ap-south-1a ap-south-1b ap-south-1c

EC2

EC2

EC2

root

root

root

**EFS(Elastic File System)**

* File share concept will use NFS protocol

**SNOW FAMILIY(Physical BOX)**

* *SnowFamily* is physical transfer and it is a service in AWS
* We can transfer data only S3
* *SnowFamily* is used to transfer HUGE data from on-premises to AWS and AWS to on-premises (vice versa)

Example: Like courier, Big physical server, Bigger HDD

Based on requirement we can order below device

* SnowCone 8TB
* SnowEdge 100TB
* SnowMobile PB(TRUCK)

**GLACIER:**

* If we are not using data frequently then we can move that data in to Glacier(archive/backup)
* Glacier is cheaper than S3

**STORAGE GATE WAY(SG)**

* It is used to synchronizing data from on-premises to AWS

SG

**ON-PREMISES**

2TB/8TB ..etc

**STORAGE GATE WAY**

**ROUTE53**

* Route is all about routing purpose
* Route53 is DNS service in AWS
* DNS port number is 53

EC2

ELB

EC2

R53

EC2

ASG

DNS Name

https://myE.352656.elb.aws.amazonaws.com

myhome.com

**DIRECT CONNECT**

* AWS will provide dedication connection from on-promises to AWS network(i.e between company and AWS)
* It is dedicated connection and more expensive (lease line connection)

**EDGE LOCATION:**

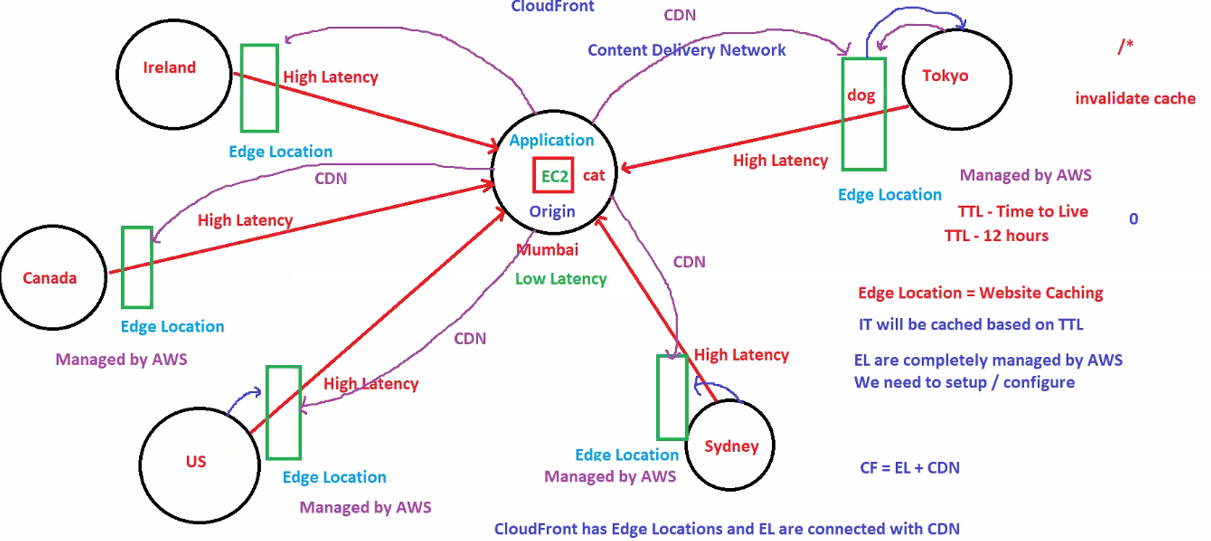
* Edge location is nothing but cache server/website Caching
* It will be cached based on TTL
* EL is completely managed by AWS, we need to setup/configure
* Each and every region has its own edge location and completely managed by AWS
* Inside CloudFront we will configure Edge location settings.
* While configure Edge location we will be configure **TTL(Time To Live)**
* We can break TTL value by using **invalidate cache**

**CONTENT DELIVERY NETWORK**

* It is AWS internal network
* Using this data will be copied into edge location
* Edge locations are connected to each other using CDN

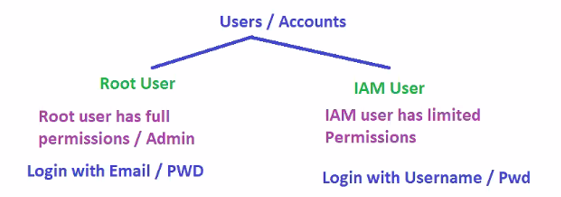
**CLOUDFRONT:**

* As name suggest, Cloud is Infront of you
* CloudFront has Edge locations and EL are connected with CDN
* CloudFront = Edge Location (EL)+ CDN

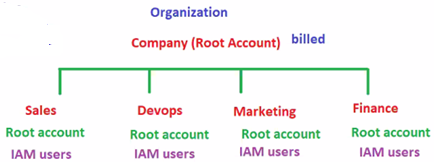


**IAM (IDENTITY AND ACCESS MANAGEMENT)**

* We can control the entire AWS account using IAM by giving proper permission to the IAM users
* The person who provides the card details he/she is the root user, the users how are using from that account they are called IAM users



* Organization is a service which handles multiple root accounts



**AWS SUPPORT**

* Basic Support -- Free service
* Developer Support -- Cost
* Business Support -- Cost
* Enterprise Support -- High Costly