**Market competitor:-**

AWS

Microsoft Azure

google

vmware

-----

**AWS Services:**

**Networking and conn type:**-

VPC

Dirct connect

Route 53 (DNS service)

cloud front :-trasnfer the data form one regin so no need to pull the data from us location

-------------

**Compute:-**

**EC2 (Elastic compute cloud) :-**Virtual server

**EC2 container :-** run and manager container

**Elastic beanstalk:-**

**Lamda :-** practice

**Lightsail**

**------------**

**Storage service:-**

**S3 :-**

**Glacier :**

**IAM:-** Identity access management

1. Centralize control of your account

**User group**

**Role**

**Password policy**

**MFA** – Multifactor factor authentication

**VPC:** Virtual private cloud

**Udemy Course:**

**IAM:-**

* Centralised control of your account.
* Shared access to your account
* Granular permission
* Multifactor authentication
* Provide temporary access for user access and service where necessary.
* Password rotation policy
* Its universal it does not apply region at any time.
* **User**
* **Group :-**collection of user under one set of permissions.
* **Roles:-** most important create role and assign them to aws resource.

**I am confused what is the exact mean of role.**

If you are creating Ec2 instance and create role with s33 admin access and map with ec2 now your ec2 instance can be access the s3 bucket

**RDS:-**

**Relational type database:**

* Oracle
* SQL server
* MySQL

Two types of backup

1 ) Automatic

2 ) Snapshots

**RDS backup:-**

**Multi AZ-RDS:-**

Its exact replica of rds production database in another region if one db fail its automatically moved into the another database. Without administrative intervention.

If performance improvement read replica best

**Read replica:-**

1 Used for scaling nt for DR.

2 you can have only 5 read replica

3 **oracle** not support read replica.

4 read can be have in same or diff region

**DnyamoDB:-**

Fast flexible and no sql database service for all the applications. Its flexible data model and reliable performance make it great for mobile web gaming

Stored data in SSD storage

Spread across 3 geographic location

Storage cost of $0.25Gb per month

**Ressift: ?**

**Elasticache:-**

Web service that makes it is easy to deploy ,operate and scale in-memory cache in the cloud.

It improve the performance of database it query the data from memory instead of database.

**Types of Elasticache:**

1. **Memcached**
2. **Redis :-** popular open source in cache memory

**Aurora:-**

Developed by amazon in 2014 my-sql based relational database provide high speed performance and cost effective open source database

It provide 5 time speed provided by commertial database

15 read replica can be create for aurora database.

**MetaData:-**

Login and than run commad

curl http://169.254.169.254/latest/meta-data

**Elastic BeanStalk:-**

1. You can have multiple version of application.
2. You can update you application and configuration.
3. Update can be one instance at a time or % of immutable updates
4. You pay for the resource but elastic beanstalk is free
5. If you delete the instance but RDS is stay it not delete.

**How to install java and tomcat in aws linux**

**Link:** https://www.youtube.com/watch?v=\_d-c9uGcUrU&index=3&list=PLA-a8PUj8k\_PQ9UAQe5c\_FmQadb-G4u8s

**Route 53 :-**

**DNS** (Domain name system)**:-**

Convert human friendly domain name (<Http://cloudguru.com>) into an internet protocol IP

Address (<http://192.168.106.50/>)

Two types of ip addrss

IPV4 :- 32 bit address 4 billion different address

IPV6 :- 128 bit address 340 undecillion (36 no of zeros) address

**Routing policy:-**

1. **Simple** :- normal redirect the traffic :
2. **Weighted** :-- 80 % to US east 1 and 20 % to Sidney

Split your traffic based on different weighted assigned

Valid value range is 0 to 255

1. **Latedncy:**-

Route your traffic based on lowest netwok latency for your end user (which region will give fastest response).

T wo zone east 100 ms(mili second latency) and west 50 ms so in this case traffic will route in west zone

**4) Failover :-**

We create two set active and passive means primary and secondary

Route 53 will monitor the health of primary site using health check if health goes down it automatically route the traffic into secondary site.

for this first I have to create the health check based on load balance Ip address.

1. **Geolocation:**

**Before creating route 53 u have one reg domain name**

**Syn Ec2 and S3 :- https://www.youtube.com/watch?v=Wd93A5Xqfmo**

**S3:-**

Object can be upto 5TB by default 100 bucket allowed by visit the site we can increase

Read after write consistency for PUTS new objects

**Cloud Front & CDN:**

Edge location: this is the location where all the content will cached this is separate from AWS region.

Origin: this the origin of all the files that CDN distribute either an S3 ,EC2 and ELB, route 53

**Cloud Front:**

Deliver your entire website static dynamic using global network of edge location request of your content is automatically routed to the nearest edge location so content is delivered in best performance. Cloud front optimized to work with S3 ,EC2 and ELB, route 53.

RTMP:-used for media streaming

TTL : time to Live

I have done s3 with cloud front :- first create bucket with images or file thn create cloud front distribution with web

**S3 Encryption:**

* By default all newly created buckets are private.
* We can setup the bucket by bucket policy
* **Amazon s3 master key and KMS master key are the encryption type.**

**Storage gateway :-**

Your applications connect to the service through a gateway appliance using standard storage protocols, such as NFS, SMB and iSCSI.

**Types of gateways**

File gateway

NFS: Network file system

Volume gateway

Using ISCSI block protocol

Tape gateway

NOT Completed:

**SnowBall:-**

Portable storage Device used to transfer the data form on premises to cloud with high speed.

It’s a petabyte scale data transport solution that transfer data in very secure manner

80 TB snowball in all region with 256 bit encryption

**Snowball edge:**

Capacity 100TB

**Snow mobile:** its used for 100 PB par snowball its pulled by semi-trailer truck

Understand with import and export

Snowball can import and export data from s3

**For snowball first we have to book the snowball:**

**Than connect with server and transfer the data**

**S3 Transfer Acceleration:**

Transfer acceleration utilise the cloud front edge network to accelerate your upload to s3.

Instead of directly upload to the s3 bucket

First create bucket and than go to the properties and than enable the acceleration

It use the endpoint url of amazon Endpoint: bucket-name.s3-accelerate.amazonaws.com it transfer to the amazon backbone network and than to the s3 bucket.

**Static website:**

--------------------------------------------

**Application service:**

Web-service that gives you access to message queue that can be used to store messages while waiting for a computer to process them.

*Distributed queue system*

--------------------------------------------

**VPC:-Virtual private cloud**

**Subnet**

**Route table**

**Internet gateway**

**NAT**

A virtual private cloud (**VPC**) is a virtual network dedicated to your **AWS** account. It is logically isolated from other virtual networks in the **AWS** Cloud. You can launch your **AWS** resources, such as Amazon EC2 instances, into your **VPC**.

**Tenancy:** default means your own hardware you will not to share your machine but its costly

Aws always reserved 5 ip address

If series is 10.0.0.0/24 than 10.0.0.0 , 10.0.0.1 , 10.0.0.2 , 10.0.0.3 and 10.0.0.255

Will not be avaliabe

**Private IP Addresses**

|  |  |  |  |
| --- | --- | --- | --- |
| **Class** | **Private Networks** | **Subnet Mask** | **Address Range** |
| A | 10.0.0.0 | 255.0.0.0 | 10.0.0.0 - 10.255.255.255 |
| B | 172.16.0.0 - 172.31.0.0 | 255.240.0.0 | 172.16.0.0 - 172.31.255.255 |
| C | 192.168.0.0 | 255.255.0.0 | 192.168.0.0 - 192.168.255.255 |

NAT:-

NAT Instances. You can use a **network address translation** (NAT) instance in a public subnet in your**VPC** to enable instances in the private subnet to **initiate**outbound IPv4 traffic to the Internet or other AWS services, but prevent the instances from receiving inbound traffic initiated by someone on the Internet.

**How to connect private ip based ec2 with public:-**

**https://www.youtube.com/watch?v=tD9vDv0uyI8**

1 first create one vpc with ip range as 10.0.0.0/16

2 create two public and two private with ranges ip as 10.0.1.0/24, 10.0.2.0/24, 10.0.3.0/24, 10.0.4.0/24

One private and one public in same region

3 mark public subnet go to action and modify assign ip yes

4 create internet gateway and attach your vpc to that gateway

5 create two route table private and public with that vpc

6 Create one ec2 with created vpc and public subnet

7 Second with same vpc and private subnet

8 Now go the route table and mark pub subnet to pub route table

9 Same with private table

10 create one NAT with public subnet which u have added in ec2 instance on creation of instance map and create NEW EIP

11 In route table go to the route and add 0.0.0.0/0 with created internet gateway

12 In private subnet go to the route and add 0.0.0.0/0 with created NAT

13 create security group with http https ssh and map to the public ec2

14 create one more ec2 with ssh http and https and ipv4 and mark the subnet Ip range of that instance from where we will access our private ip machine and attach that security group to the private ec2

14 login putty with public ip of ec2 with ppk file

14 once login done try

Move to the root by command -sudo su

Create one pem file which we have create on creation of ec2

Cat>myPvk.pem than ctrl+c

vi myPvk.pem and than paste the content of pem file

now try to ping public ec2 machine with ip if ping done

run chmod 400 myPvk.pem

than ssh ec2-user@pivate\_machine\_ip -i myPvk,pem than enter and yes

than sudo su and try to run sudo yum update if working than all setup done

otherwise problem in NAT.

**Network ACL vs security group:**

When create ACL by default all network denied

Rules are evaluated in numerical order

We can block the ip range as well as http https ssh and any inbound traffic with the help of ACL

--------------------------------------------

**EC2:-**

Autoscalling

ELB

Low Cost

CloudWatchMonitoring

**EBS:-** EBS allows you to create volume and attach them into amazon EC2 instance.once you create you can create database and anything which you want.

1. General purpose SSD (GP2) :-

* General purpose both price and performance
* Ratio 3 IOPS to 10,000 IOPS and burst upto 3000 IOPS

1. Provision IOPS SSD (IO1) :-

If you need more than 10,000 IOPS upto 20,000 IOPS

1. Throughput optimized HDD (ST1):-

Big data

warehousing

Log processing

4 ) Cold HDD (SC1):- less frequently access data

lowest cost storage for infrequently accessed workloads

File server

Cannot be boot volume

1. Magnetic (Standard) : - lowest cost per gigbyte of all EBS volume type that is bootable important for where low cost is important.

**We cannot mount 1 EBS to multiple EC2 instance**

**Reserved cost is less if we purchase for long years**

**Security group:-**

1. All inbound traffic blocked by default
2. All outbound traffic is allowed
3. Changes to SG group update immediately
4. You can map no of SG group with one EC2 instance
5. You can block specific ip by SG group

**EBS volume type:-**

* We can not modify magnetic disk size.
* If you want to change your availability zone of new created volume EBS first you have to create snapshot and than create the volume.
* If you want to modify the availability zone of disk first create the image and than copy snapshot
* Want to move ec2 instance in another zone create snapshot with that snapshot create image and than go to the images and copy image and lunch
* Volue exist on EBS.
* Snapshot exist on s3 bucket.
* Snapshot are point in time copies of volumes.
* First time created snapshot take time.
* When create snapshot volume serve as root so stop instance first.
* Snapshot stored in s3 encrypted automatically.

**Raid volume and snapshots:-**

* RAID :- redundant array of independent disks
* RAID 0 :-striped no redundancy good performance.
* RAID 1 :- mirrored , redundancy
* RAID 5:- good for read not for write aws not recommended for RAID 5.
* RAID 10 :- striped and mirrored good redundancy good performance.

**AMI:-**

**Amazon machine image:-**

**Copy of same instance called AMI**

Create snap shot than copy that snapshot and than create the image of that snapshot now root volume has encrypted

**Instance store and EBS volume:**

**Most important when you lunch the instance.**

**Root device type**

1. **EBS**
2. **Instance store**

You can not stop the instance store, only reboot and terminate the instance but EBS you can do.

You can not detach the volume from instance store but in EBS can we do.

Instance store volume sometime called **Ephemeral volume.**

**Dashboards:** Create awesome dashboard to see what is happening with your aws account.

**Events :-** cloudWatch events helps you to respond to state changes in your aws account

**Cloud watch:-**

Go the dashboard and than we can create the cloud watch

**ELB**:- Elastic load balance

* Its virtual machine
* Load balancer balance the load according the load and maintain the http and https traffic

3 Types of load balancer

* Application load balancer :- called layer 7
* Network load balancer :- use for extreme performance :- called layer 4
* Classic load balancer

504 error means getway time out this means application not responding within time limit.

Trouble shoot the application at web layer and database layer

**AWS cli:**

First install cli in mahince and than run command aws confiure than enter the details

How to copy files form s3 bucket to ec2

Create bucket and than create one IAM role with s3 access ma that role to the ec2 instance than go to the putty and run command

Aws s3 ls : check bucket name

Than run command aws s3 cp –recursive s3:bucket\_name /home/path

**BashScript:**

**Used when configure the ec2 instance**

#!/bin/bash

yum update -y

yum install httpd -y

service httpd start

chkconfig httpd on

**How to connect cli to ec2**

ssh ec2-user@ip -I mykey.pem

pem should be at present directory

ex

if your dir is C:\Users\LENOVO than the file should be at that path

IP for metadata :http://169.254.169.254/latest/meta-data/

**Autoscaling:-**

Create instance according to cpu capacity its basically work on cpu usage if cpu memory usage goes above the limit it automatically create the instance

With same configuration and data.

**EFS:- Elastic file system ?????**

EFS is easy to use and provide simple interface that allows you to create and configure file system quickly and easily. EFS storage capacity growing and shrinking easily

* Can scale upto petabytes
* Read after write consistency

**Lambda:** is serverless compute that runs your code in response to events and automatically manages that underlaying compute resources for you.

Lambda charge for par http request first 1 million are free and $0.20 per 1 million request

No servers :serverless

Continus scaling

Super super cheap