CLF-C01

Server comprises of-

1) Compute (CPU)
2) Memory (RAM)

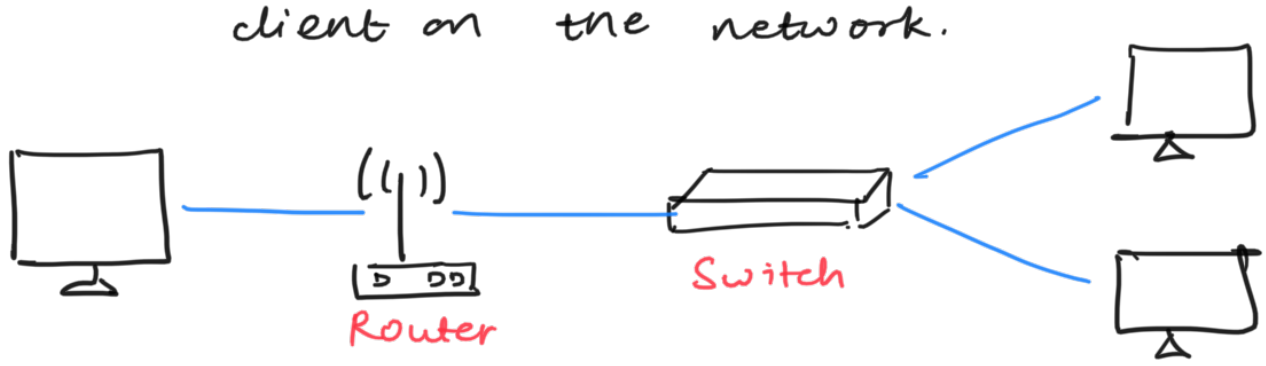
- Storage Data (Files)
- DB - store data in a structured way
- Network: Routers, switch, DNS server.

Terminologies-

Network: cables, routers, servers connected to one another

Router: A networking device that forwards data packets b/w computer networks. They know where to send packets on internet.

Switch: Takes a packet and send it to correct server/client on the network.



Problems with traditional approach.

- Rent for data center.
- Power, cooling, maintenance
- Add/Replace hardware takes time
- Scaling is limited.
- Hire 24/7 to monitor
- Disasters?

Cloud Computing - On Demand delivery of compute power, database storage and other IT resources

Gmail, Dropbox, Netflix, etc.

Deployment models for cloud:

Private	Public	Hybrid
- Used by single organization - not exposed to public	- owned & operated by a third party cloud service provider delivered over	- onprem + cloud - control over sensitive assets in your private infrastructure

- complete control
- Security for sensitive apps.
- Meet specific business needs
- Rackspace

Internet
- 6 advantages
- GCP, AWS, Azure

- Flexibility & cost effectiveness of public cloud.

5 Characteristics of Cloud Computing

1) On demand self service
- Users can provision resources and use them without human interaction from service provider.

2) Broad network access
- Resources available over network, and can be accessed by diverse client platforms.

3) Multi-tenancy & Resource Pooling
- multiple customers can use same infrastructure & apps
- multiple customers are serviced from same physical address.

4) Rapid elasticity & scalability
- acquire & dispose resources when needed
- quickly & easily scale based on demand

5) Measured service
- usage is measured. pay for what you use.

6 Advantages of Cloud computing.

1) Trade capital expenses (CAPEX) for Operational Expense (OPEX)
Pay on demand - don't own hardware
Reduced Total Cost of Ownership (TCO) & OPEX.

2) Benefits from massive economies of scale.
- reduced prices due to large scale

3) Stop guessing capacity.
- Scale based on actual measured usage.

4) Increased speed & agility

5) Stop spending on running & maintaining data centers.

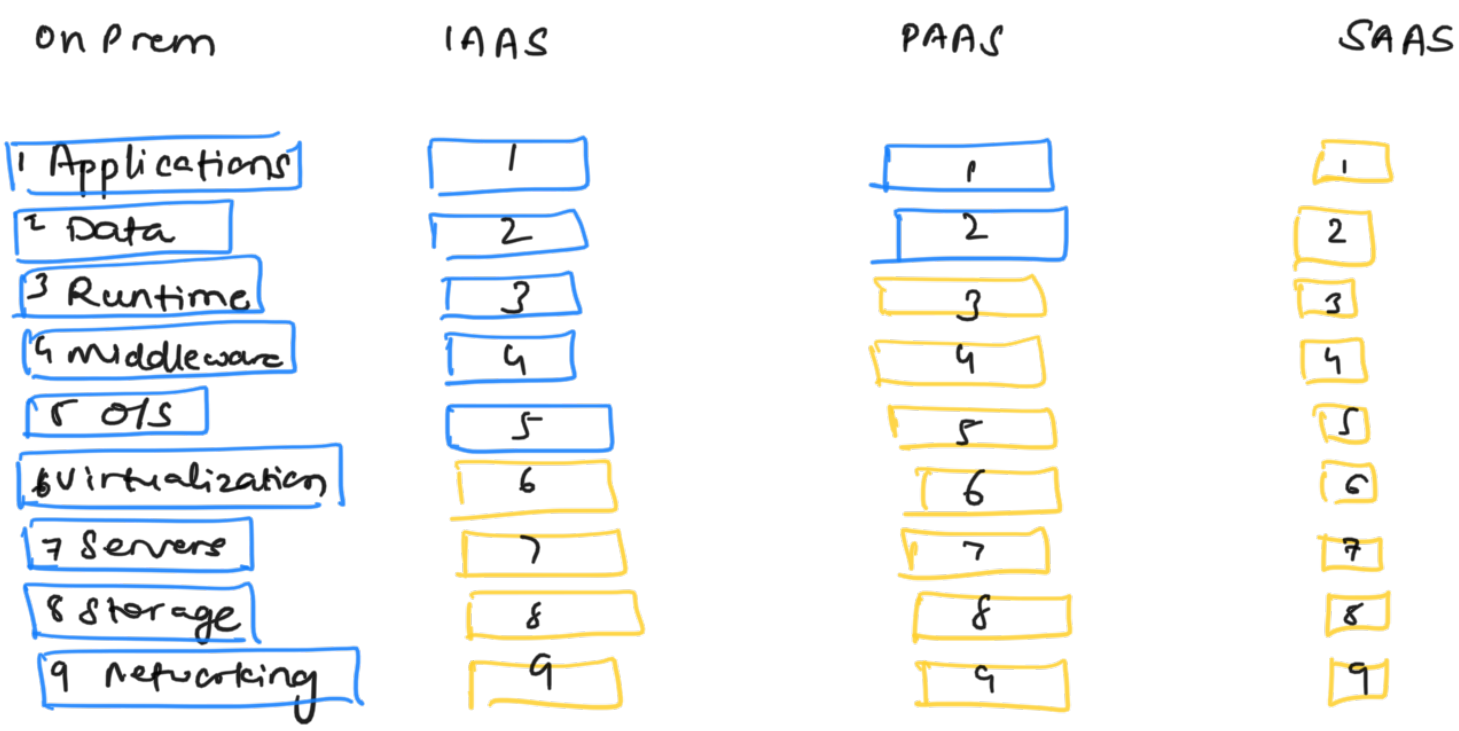
6) Go global in minutes - leverage the AWS global infrastructure.

Problems solved by cloud-

Flexibility, cost, scalability, elasticity, availability & fault tolerance, agility.

Types of cloud computing

1) Infrastructure as a Service (IAAS)
2) Platform as a Service (PAAS)
3) Software as a Service (SAAS)



IAAS - EC2
- GCP, Azure, Rackspace, Digital Ocean, Linode.

PAAS - Elastic Beanstalk.
- Heroku, Google App Engine (GCP), Windows Azure (Microsoft)

SAAS - many AWS services (Rekognition for ML)
- Google apps (Gmail), Dropbox, Zoom.

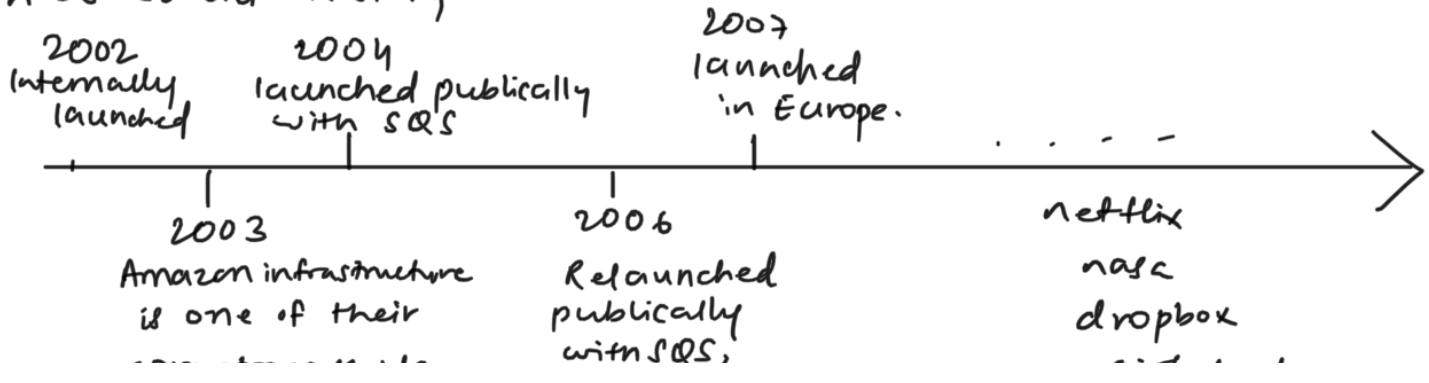
AWS Pricing

1) Compute - pay for compute time

2) Storage: pay for data stored in cloud

3) Networking - Data transfer OUT of cloud.
- Data transfer IN is free.

AWS Cloud History



core strength idea to market — S3 & EC2 — airbnb etc.

AWS Global Infrastructure.

- Regions - all around world, us-east1, eu-west-3
- Availability zones -
- Data centers
- Edge locations / Points of Presence - 216 Points (205 edge loc^n & Regional cache) in 84 cities across 42 countries.

Region: a cluster of data centers
- most AWS services are region scoped

How to choose an AWS region?
Factors that affect -

1) Compliance : with data governance and legal requirements data never leaves a region without permission.

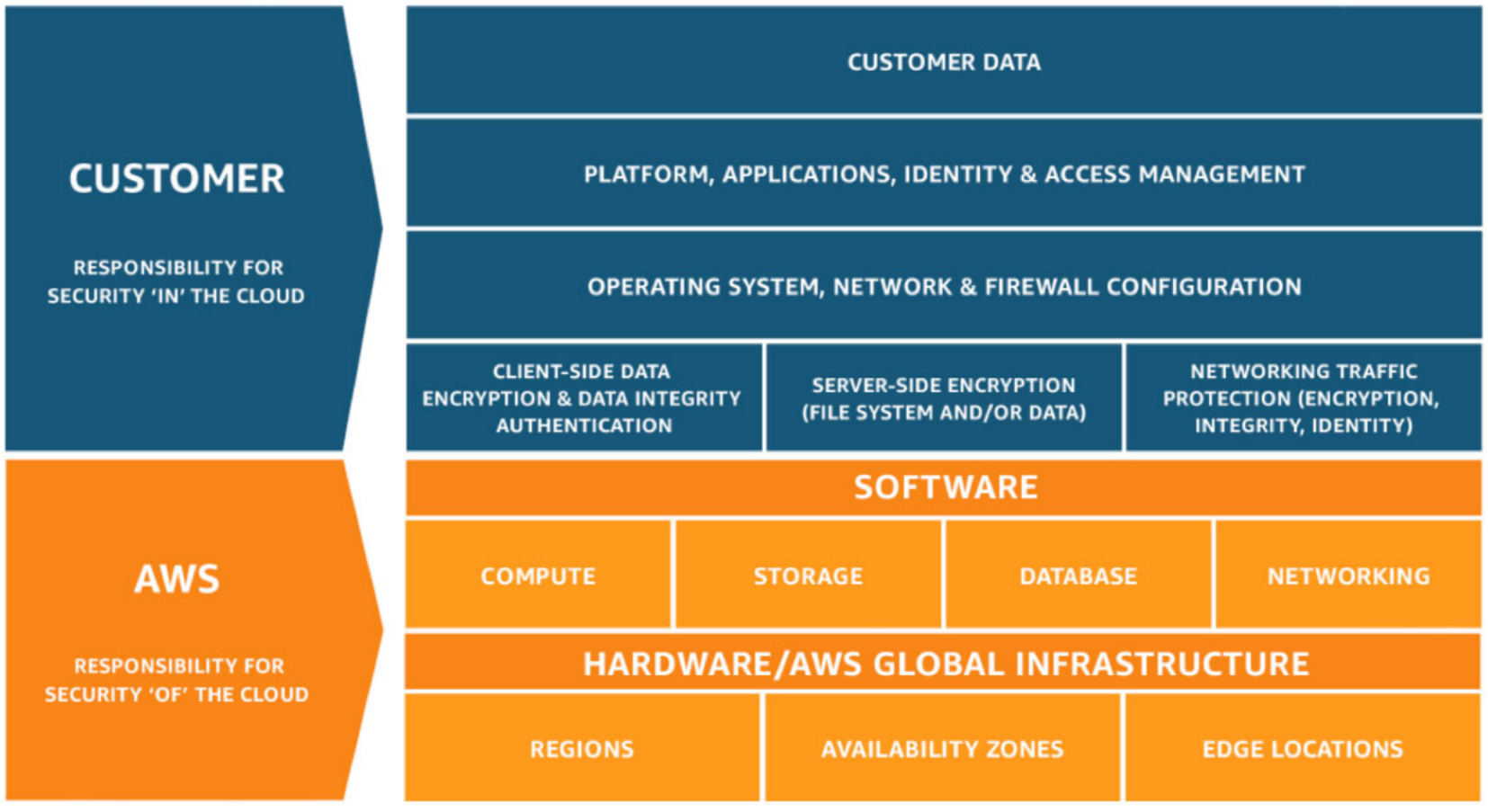
2) Proximity to customers: reduced latency

3) Available services within a Region

4) Pricing: varies from region to region

Availability zones - each region has many availability zones. (AZ) usually 3, min 2, max 6
- Each AZ is one or more discrete data center with redundant power, networking & connectivity.
- isolated from disasters, separate
- connected with high bandwidth, ultra low latency networking

* Shared Responsibility Model Diagram


CUSTOMER
RESPONSIBILITY FOR SECURITY 'IN' THE CLOUD
AWS
RESPONSIBILITY FOR SECURITY 'OF' THE CLOUD
CUSTOMER DATA
PLATFORM, APPLICATIONS, IDENTITY & ACCESS MANAGEMENT
OPERATING SYSTEM, NETWORK & FIREWALL CONFIGURATION
CLIENT-SIDE DATA ENCRYPTION & DATA INTEGRITY AUTHENTICATION
SERVER-SIDE ENCRYPTION (FILE SYSTEM AND/OR DATA)
NETWORKING TRAFFIC PROTECTION (ENCRYPTION, INTEGRITY, IDENTITY)
SOFTWARE
COMPUTE
STORAGE
DATABASE
NETWORKING
HARDWARE/AWS GLOBAL INFRASTRUCTURE
REGIONS
AVAILABILITY ZONES
EDGE LOCATIONS