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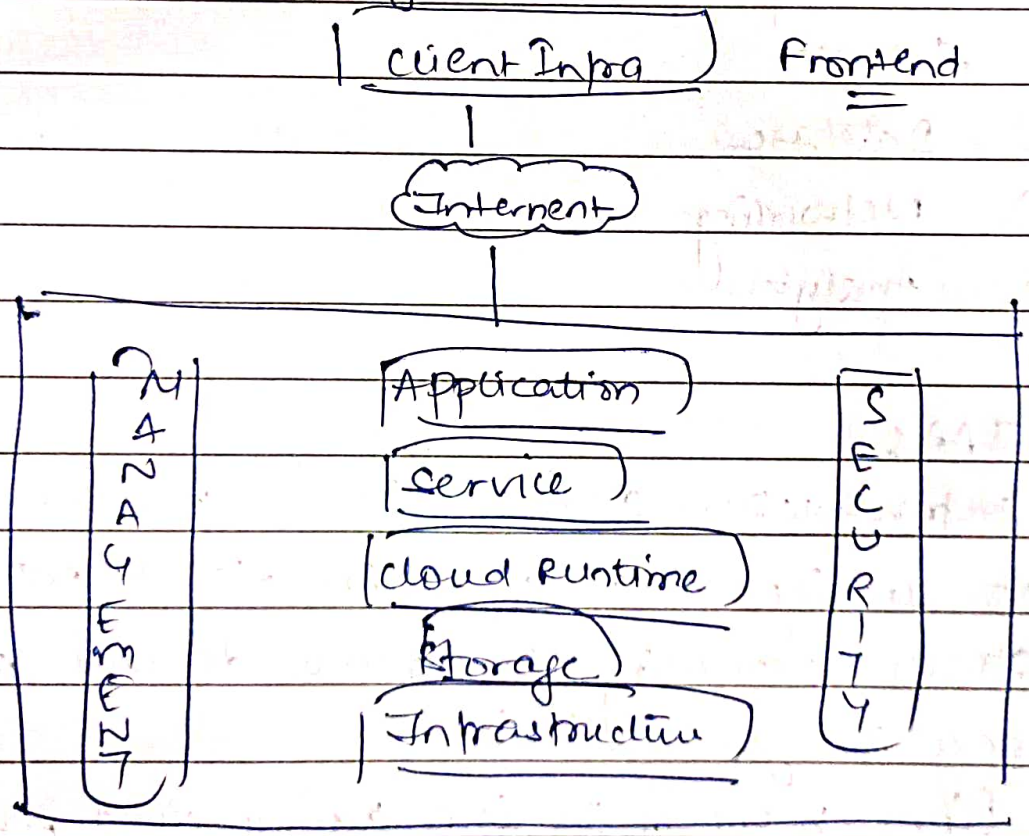
Cloud Computing Architecture

→ Combination of both SOA and EDA i.e., Service Oriented Architecture & Event driven Arch. Client infrastructure & mgt. & security, all these are the components of cloud computing architecture.

Cloud Architecture

Frontend Backend.

Internal view is given as:-



* Frontend of cloud arch refers to the client side. Contains all the user interfaces & applications which are used by the client to access the CC services.
* Backend refers to the cloud itself which is used by the service provider.

Components of cc arch:-

1) Client Infrastructure
2) Application
3) Service
4) Runtime cloud
5) Storage
6) Infrastructure
7) Management
8) Security
9) Internet
10) Database
11) Networking
12) Analytics.

IAAS

"Infrastructure as a Service" is a type of cc service that offers essential computing, storage, networking resources on demand, on a pay as you go basis.

IAAS is one of the four types of cloud services along w software as a service, platform as a service & serverless.

Migrating your organisation's infra to an Iaas solution helps you reduce maintainence of on premises data center, save money etc.

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Importance

→ Iaas has risen to prominence as enterprises have sought alternatives to deploying and maintaining their own-on premise infra.

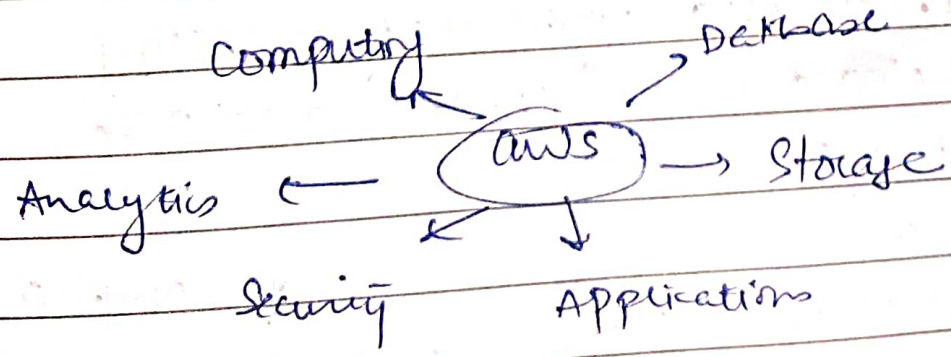
It has offered a cost effective solution to high cost computing equipment.

This learns the customers/clients to collect, process, store, & retrieve data.

AWS.

→ It is the world's most comprehensive & broadly adopted cloud offering, over 200 fully featured services - including the fastest growing startups, enterprises, govt.

AWS has significantly more services than any other cloud provider - from infra technologies like storage, compute to emerging technologies such as ML & AI.



AWS pricing model is very cost effective which make it most reliable.
There is no long commitment as 5 or 10 years.
Besides, there is AWS free tier service offering upto 58 products that help user affordability and gain some experience to the AWS platform.
Eg: Companies using AWS are -
Netflix, Coinbase, J & J, Adobe, Airbnb, Hitachi etc.

EC2 (Elastic cloud computing)
→ It provides on demand, scalable computing capacity in the AWS cloud.
Using Amazon EC2 hardware costs so you can develop & deploy applications faster.
You can use EC2 to launch as many instances as you need.
An EC2 instance is a virtual server in the AWS cloud. The instance type that you specify determines the hardware ~~available~~ available to your instance.
Each instance offers a diff. balance of compute, memory, network & storage resources.

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Features

(i) Instances - Virtual servers

(ii) Amazon Machine ~~Image~~ Images (AMIs)

Pre configured templates for your instances that package the components you need for your server (including OS & additional software).

(iii) Instance type

Various configurations networks, memory, storage, graphics make up the instance.

(iv) keypairs

Secure login info for your instances. AWS stores the public key & you store the put key.

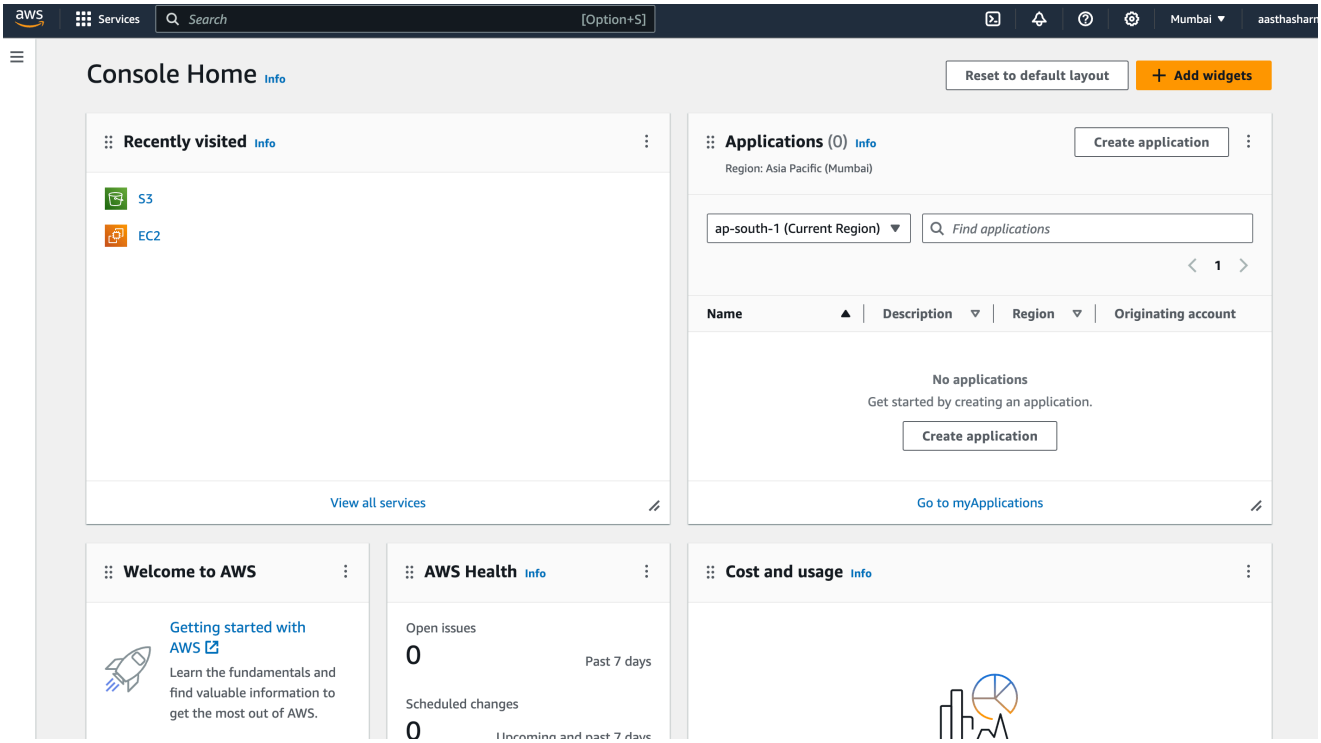
(v) Security groups

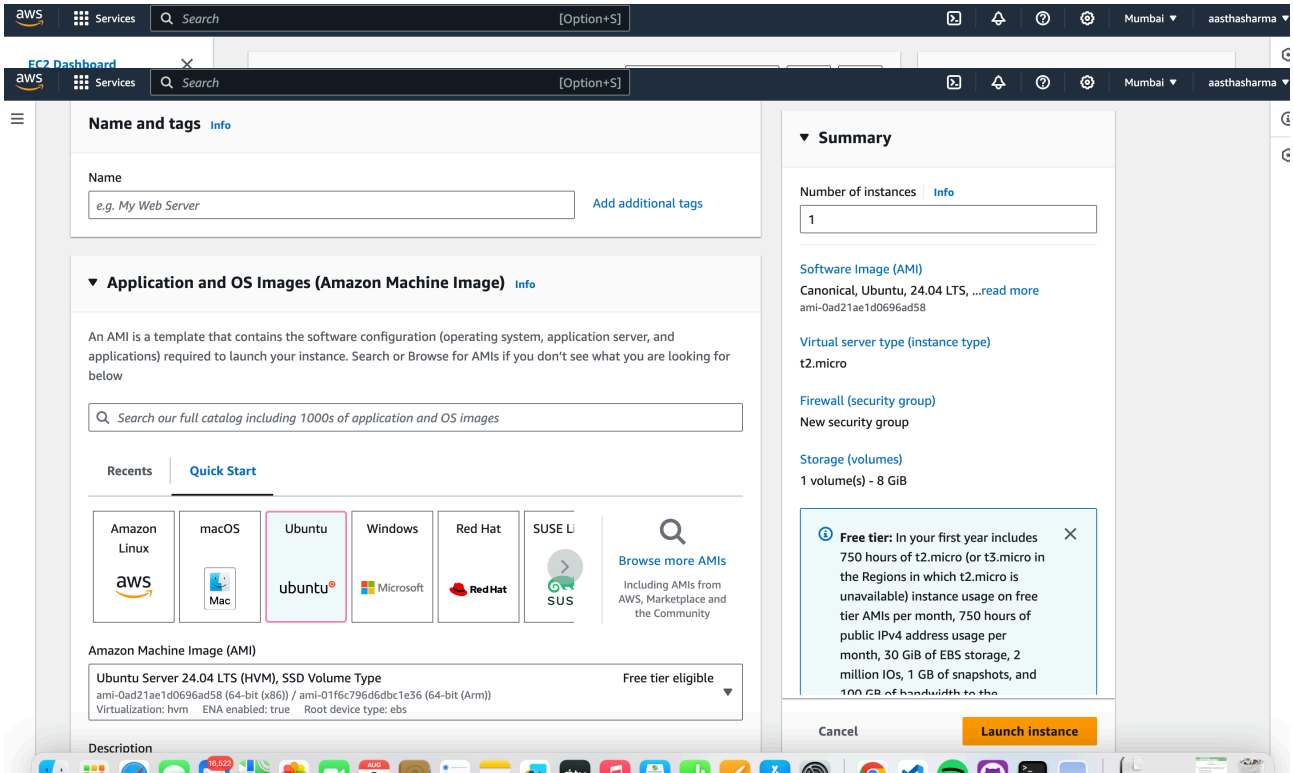
A virtual firewall that allows you to specify the protocols ports & source IP ranges to which your instances can connect.

Amazon EC2 supports the processing, storage of transmissi of credit card data by a merchant or service provider and has been validated as being compliant of payment card industry (PCI), Data security standard (DSS).

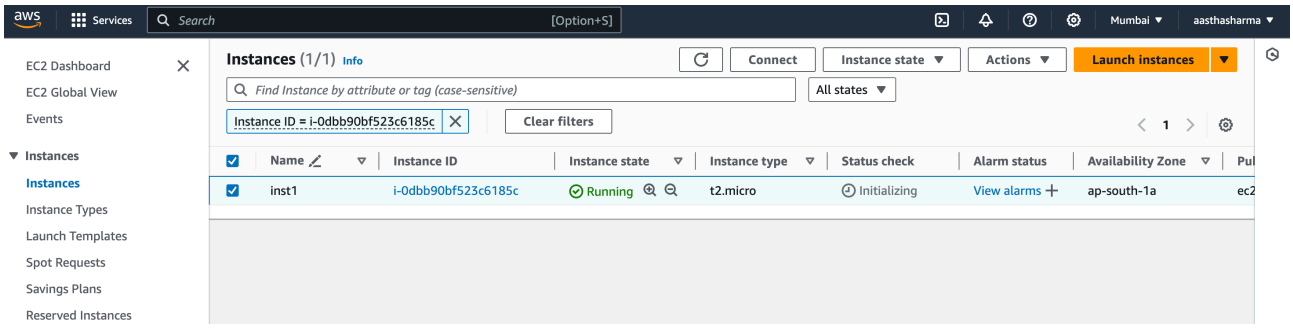
Cloud Computing
Practical-1

Steps to launch an instance





Launching Server
(Ubuntu)



Ubuntu command

```
ubuntu@ip-172-31-39-50:~$ LS
LS: command not found
ubuntu@ip-172-31-39-50:~$ ls
ubuntu@ip-172-31-39-50:~$ whoami
ubuntu
```

Installing python

```
E: Package 'python' has no installation candidate
ubuntu@ip-172-31-39-50:~$ sudo apt install python-is-python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

Python commands

```
ubuntu@ip-172-31-39-50:~$ python3
Python 3.12.3 (main, Apr 10 2024, 05:33:47) [GCC 13.2.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> print("hello")
hello
>>> print(2+2)
4
>>>
```