Unit 1

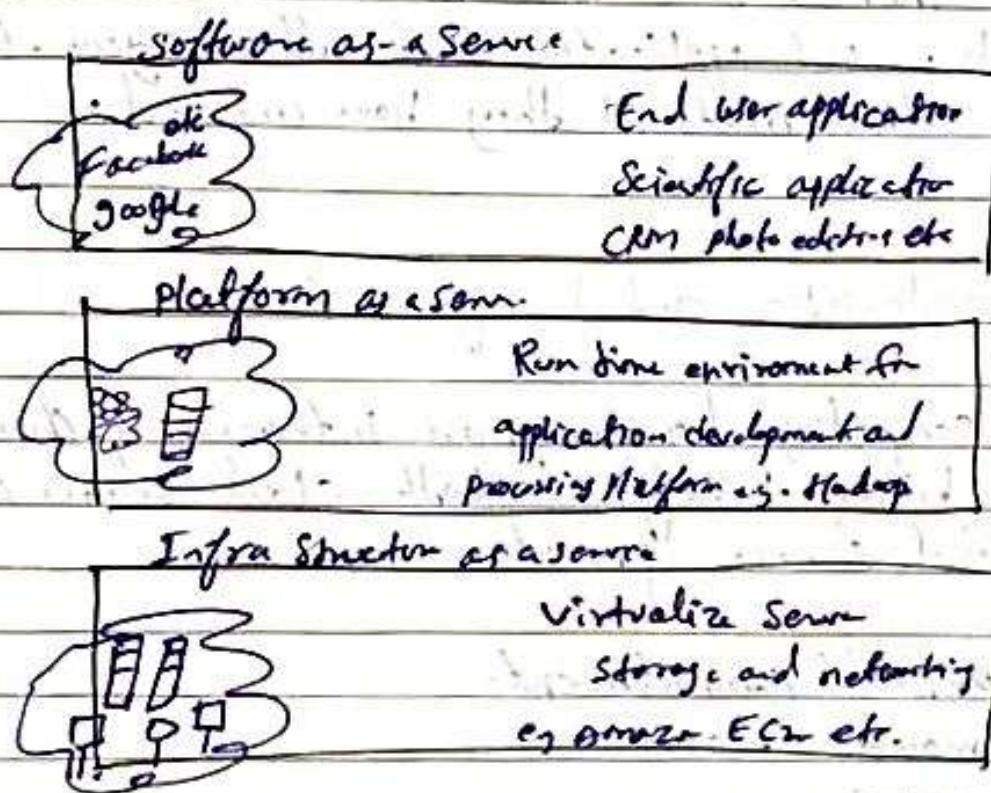**Q** Define cloud computing:-
Cö cloud computing is on demand availability of computer system, especially data storage and computing power without direct active management power by the user.

cloud computing refrence model?

software as-a Service

End user applications
Scientific applications
Crm photo editors etc

Platform as a serv.

Run time environment for application development and processing Platform e.g. Hadoop

Infra structure as a source

Virtualize serv
Storage and networking
eg amaze EC2 etc.

→ infra structure as a source:-
cloud computing offering which vendor providing user access to computing resource such as server, storage and networking

→ Platform as a service:-
It a cloud computing offering that provide user with cloud environment in which they can develop, manage deliver application.

→ Software as a Service:

In this form cloud computing provide user or vedio Vendors to access cloud base software. user do not install user can store and analyze data and colloborate on project.

→ Web 2.0

Ther web 2.0 used to describe a vanety of web site. and application that allow anyone to create share online material they have created.

✶ Characteristic and benefit

cloud computing has Some more interecesting characteristic that bring benefit to both cloud service or consum or cloud service provider.

•) No up-front commitment.
•) on demand access
•) Nice pricing
•) Simply fied application and scability
•) efficient resource allocation
•) energy efficieny

challenges ahead

As any new technology develop and becom or popular new the issue have been faced.

→ Everyday new problem and challenged on posed to the cloud community.

→ It may include IT practitioners, manager, government and regulator.

following problem faced by cloud community.

- Configuration
- networking
- Sizing of cloud computing system
- virtualization technology
- Security.

Distributed system in cloud computing :-

→ In distributed system multiple computer system that work an a single problem.

→ A problem distribute into many part and each parts solve by different different computer resource.

→ All the computer resource connected to each other to resolve the problem.

→ The goal of distributed system overall increase the performance

→ Distributed cloud computing has three major categories.
① mainframe, ② clustering ③ Grid.

Mainframe :-

→ It is a powerful computer which behave as a source as the main that data storage.

→ It connected to the user via less powerful device eg workstation or terminal.

→ It is easy to manage or protect

→ It is used for long-scale processor eg large organization, bulk data processing.
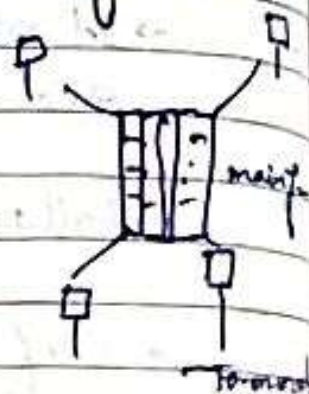
Clustering computing :-

→ A cluster is a types a computer system that is paralled or distributed.

→ It is usually used for provide greater comptational power.

→ The speed of cluster computing is fast

→ PVM and MPI there on two method wideley used in clustering.

PVM → parallel virtual machine
MPI → Message passing interface

Grid Computing :-

→ It is a processor archetecture that combine computer resource from different field to achive main purpose

→ It can be run operating system, linux or free software

→ Grid have a range of resource.

→ It is used in to controll large scale of data of organization.

Q Virtualization :-

→ virtualization is a process to make a physical computer more effective.

→ virtualization used to create something in virtual formate.

eg. virtual hardware, storage, server etc.

→ The main function of virtualization is any simple thing (mean computer etc.) to make more effective

eg A simple computer behave like a server

Types of virtualization.

1) Hardware virtualization

→ when virtual machine is directly installed on the hardware system is known as hardware virtualization

→ The main job of hypervisor to control or monitoring the process.

→ After virtualization of hardware system we can install different operating system on it.

② Operation System virtualization:—

→ when virtual machine of software is install on the host operating systems instead of directly hardware systems is known as operating system virtualization

→ It is mainly used to destroy the application on different platform of O.S.

③ Server virtualization:-

when virtual machine software is directly installed on server system is known as server virtualization

→ Server virtualization is done because a single server is divide into multiple saver for balancing the load.

④ Storage virtulization:-

   Is a process of groupping the physical storage from multiple network storage storage virtulization is also implemented by very software application.
   It used in for backup and recovery porpose.

Ø Web 2.0
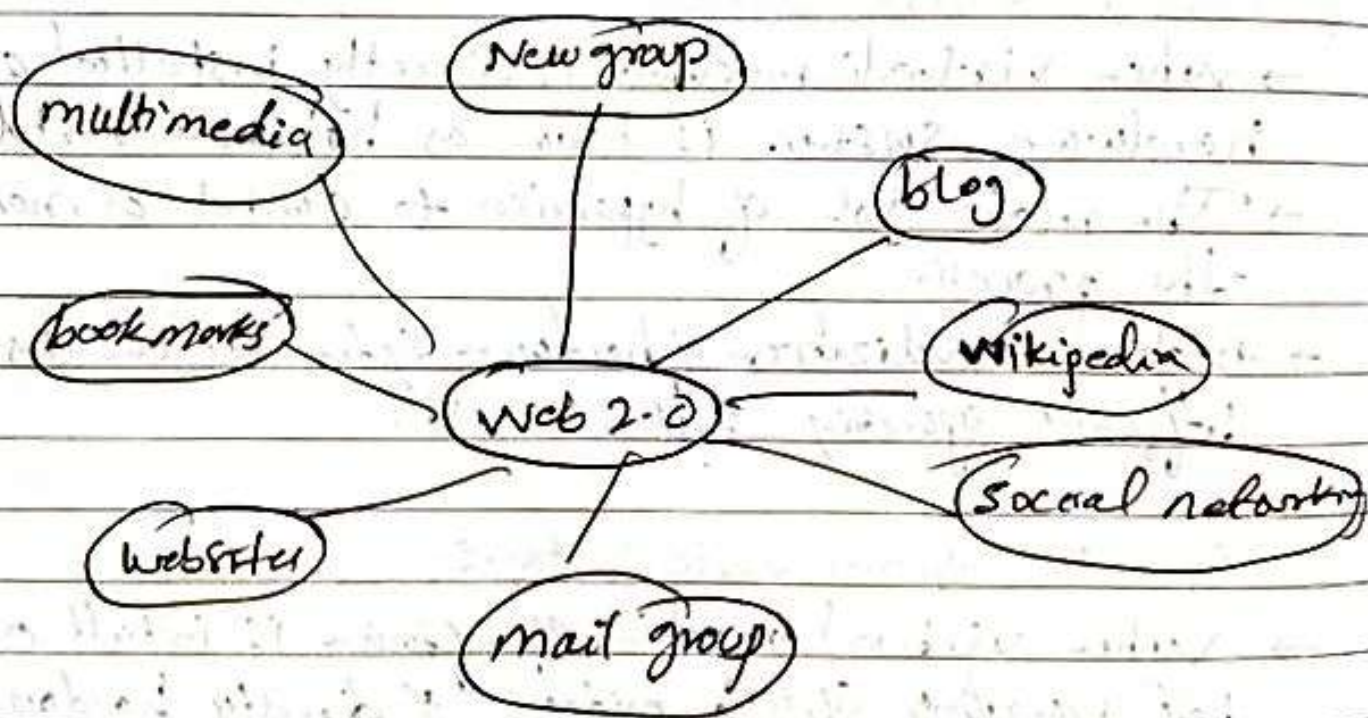
- It may include. chrome, Firefox, ...
  etc.

- **Back end**
  → The Back end is used by the service provider
  → It manage all the resource those are required
  to provide cloud computing services.

Types of cloud

public cloud:-

→ It is a platform that is accessible to general
  public through internet connection
→ public cloud is operated on the pay-as-per
  use model.
→ Same storage is being used by multiple user as
  same time.
→ Low cost, location-independent, Save time.
→ Quick and easily setup
  eg. Google drive, E2C etc.

② Private clouds.

→ private cloud is also known as internal cloud or corporate cloud.

→ It provide services (within in orgnization or selective user).

→ It provide high level of security.

→ better performane and space capacity.

eg. HP data center etc.

③ Hybrid Cloud

→ Hybrid Coloud is combination of public and private cloud.

→ the aim to combine these clood to create unified automated and well manage computing environment

→ It is Flexible and Secure.

→ It is cost cost effetve.

→ The best hybrid cloud companies service provided are.

Amazon, microsoft. etc.

④ Comprity clood:-

→ Its allow the system

Q. what is parallel & Distributed computing.

Parallel	Distributed.
→ many operation perform Simultaneously	Distributed component located at different location.
→ In parallel processing Single computer is required	uses multi computer
→ It may have shared or distributed memory	It have only distributed memory
→ improve the system performance	Improve the scability and resource shoring
→ multiple ~~computer perform~~ processor execute multiple task at same time	multiple computer perform task at same time.
→ processor communicate to each other through Bus	Computer communicate to each other through network

Structure.
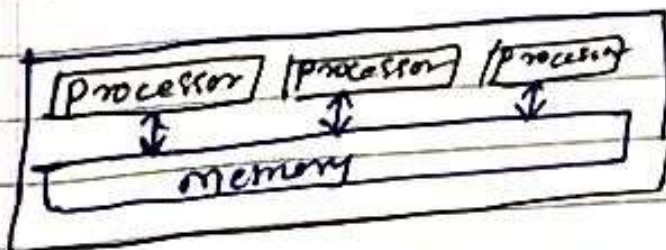
Structure.
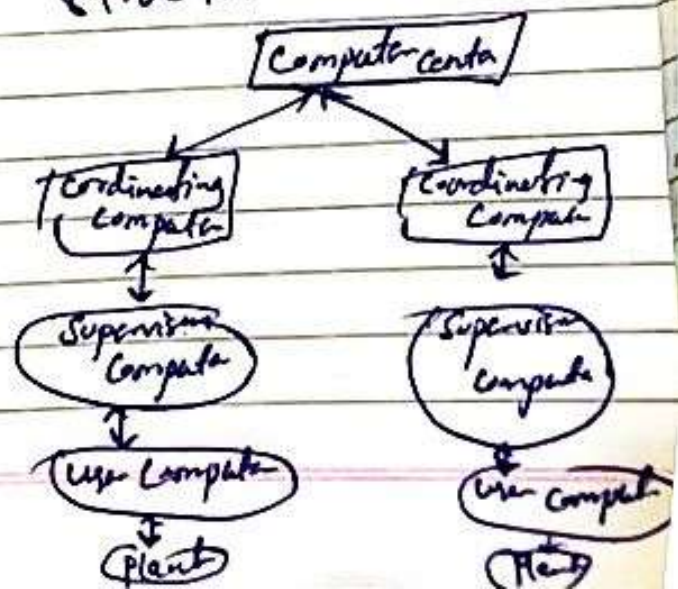
Q what is security Ring and privileged mode.

→ The cpu operate mainly on two level of privileges

User mode:- memory access in restricted
Kernal mode:- cpu have instruction for managing or access
memory in this mode.

→ non privilege mode

      The instruction that can be used with
Interrupting with another task is called non-privileged
mode.

privillege mod :

      A instruction that can be used Execute
under specific restriction or known as privilege mode.

processor are performed in layered "ring" with different
right of access to resource at each ring.

Most privilege mode   least privileged mode
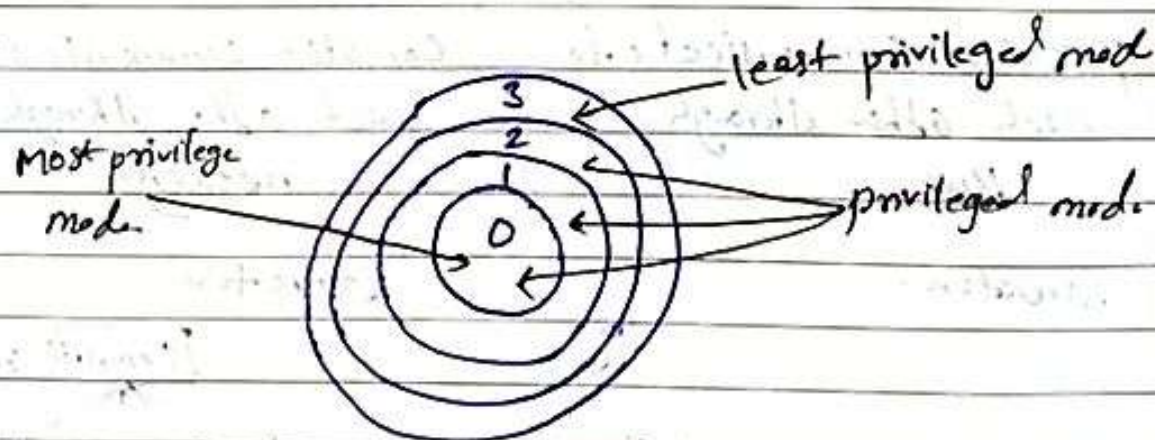
privileged mode.

The two main advantage of layer model
① It protect from System crashes
② Error can easily retrieved in higher ring.

Ring 0 :-

It is accesible of cpu kernel.
It is most privileged mode st access everything
that process in OS.
If anything fail system shotdown.

Ring 1 and Ring 2.

→ It is a special privilege mode
Ring 1 intract with your computer connected
hardware and contol it
It is used to play song, vedio on desktop etc.
Ring 2 It is used to control storage, save or
load file.

Ring 3
It is least privileged mode available for user
process in user mode.

PARALLEL COMPUTING
VERSUS
DISTRIBUTED COMPUTING

PARALLEL COMPUTING	DISTRIBUTED COMPUTING
Type of computation in which many calculations or the execution of processes are carried out simultaneously.	A system whose components are located on different networked computers, which communicate and coordinate their actions by passing messages to one another.
Occurs in a single computer	Involves multiple computers
Multiple processors execute multiple tasks at the same time	Multiple computers perform tasks at the same time
Computer can have shared memory or distributed memory	Each computer has its own memory
Processors communicate with each other using a bus	Computers communicate with each other via the network
Increase the performance of the system	Allows scalability, sharing resources and helps to perform computation tasks efficiently

Unit 2

Q Fundamental Security of cloud computing.

information security is a ensemble of complex technique, technology etc. Security is used to protect the data from malicious attack or un authorized user.

Confidentiality

Security mechanism

Security control

Fundamental Security of Cloud

Integrity

Authenticity

Risk

Threats

Availability

Cloud Security threats

```
┌─────────────────┐
│ virtulization   │
│    attack       │
└─────────────────┘

              ┌──────────────────────┐
              │ Traffic eavesdropping │
              └──────────────────────┘
                         │
                         ↓
┌──────────────┐   ┌──────────────────┐   ┌──────────────┐
│ insufficient │ ← │ Security threats │ → │  malicious   │
│ authorization│   └──────────────────┘   │ intermediary │
└──────────────┘      │         │         └──────────────┘
                      ↓          ↘
              ┌──────────┐    ┌─────────────────────┐
              │ Denial of│    │ overlapping trust    │
              │  service │    │    boundries         │
              └──────────┘    └─────────────────────┘
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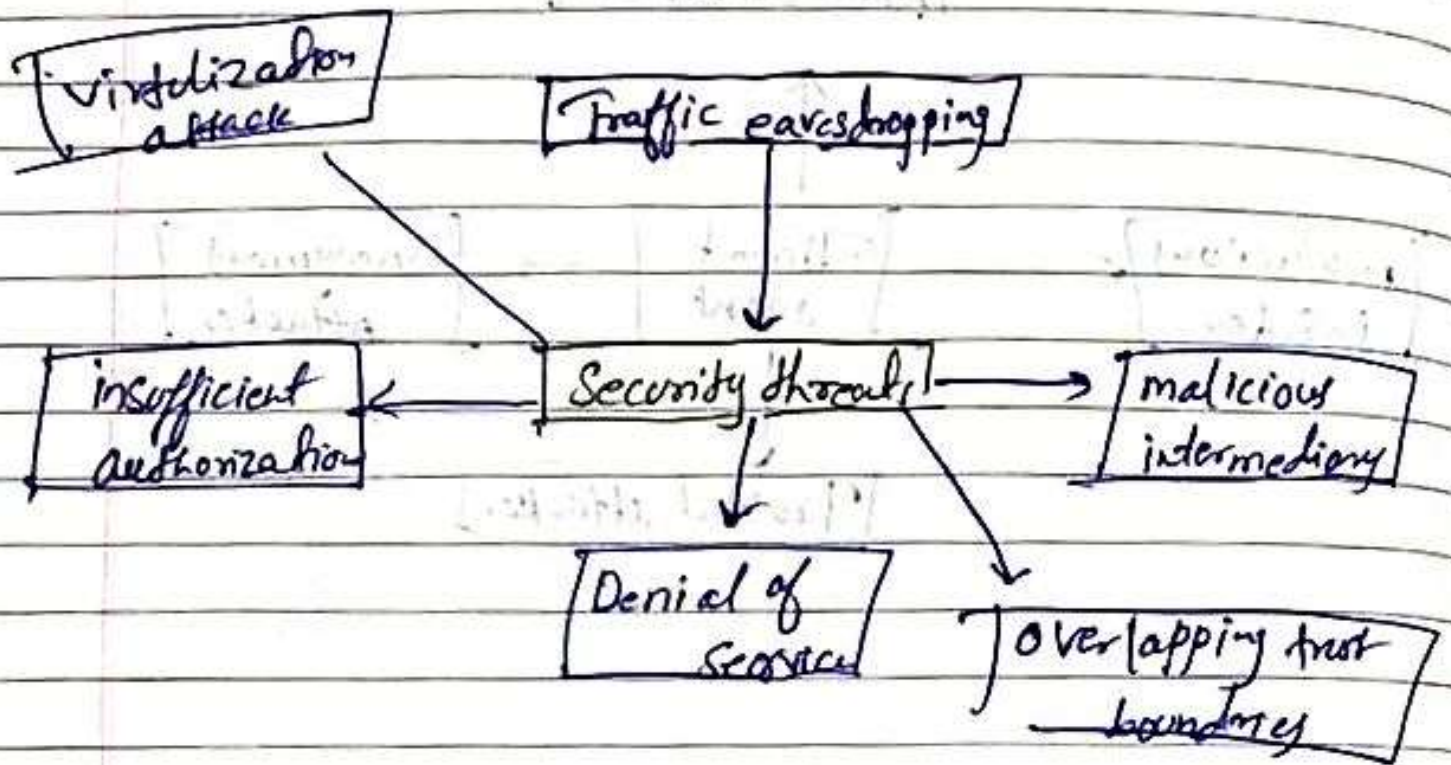
Thread agents.

```
                        serric agent
              ┌──────────────────────┐
              │ malicious ~~attacker~~ │
              └──────────────────────┘
                          ↑
                          │
┌──────────────┐   ┌─────────────┐   ┌──────────────┐
│  malicious   │ ← │   Thread    │ → │  Anonymous   │
│  insider     │   │   agent     │   │  attacker    │
└──────────────┘   └─────────────┘   └──────────────┘
                          │
                          ↓
                  ┌──────────────────┐
                  │ Trusted attacker │
                  └──────────────────┘
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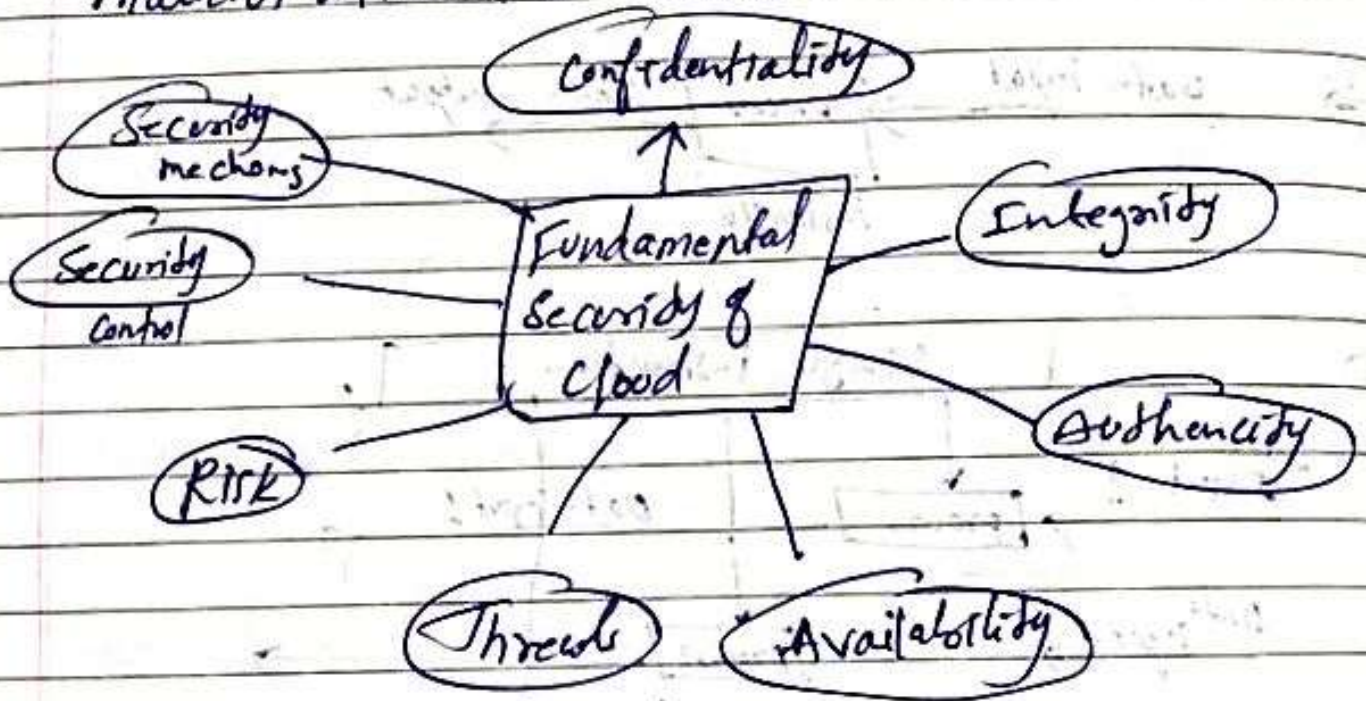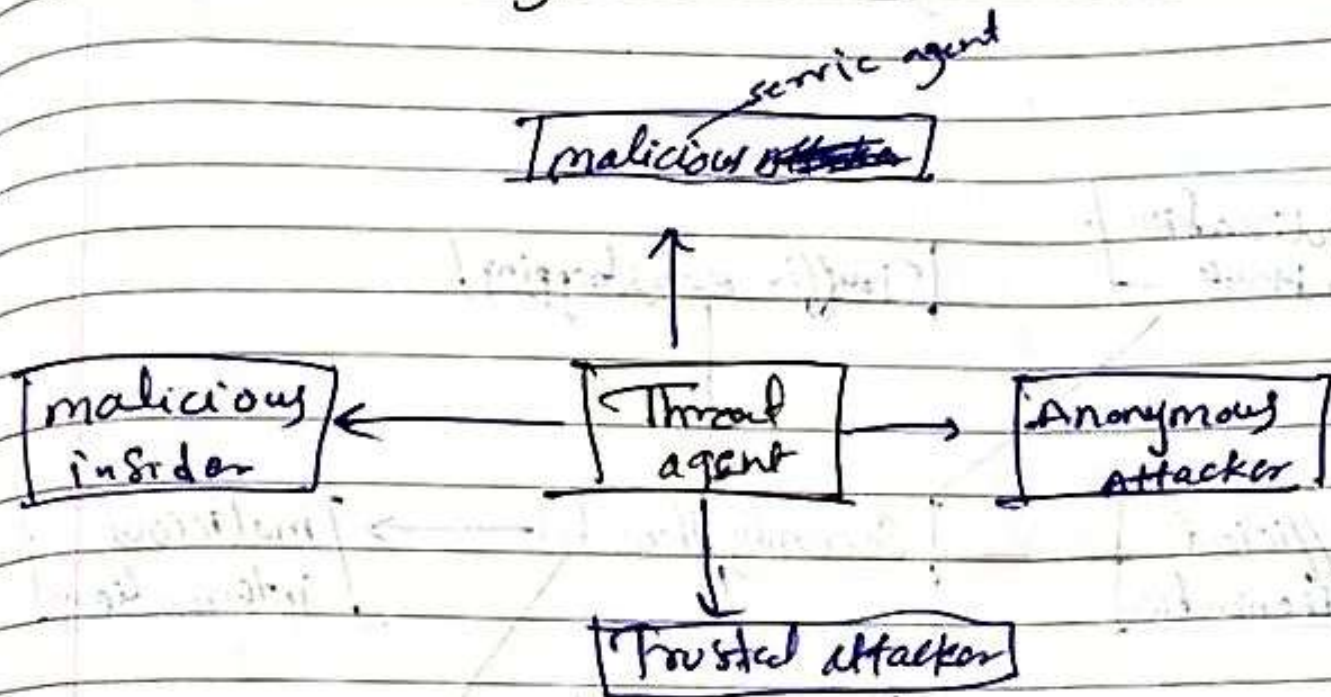
→ Automated Scalling Listener :-
• It is a service agent. That monitor and track the communication b/w clad service consumer or cloud service dynamic Scaling purpose.
• It deployed + within a cloud.
• It Typically neorest the firwall where they automatically track workload Information.
• On the bases of Consumer request / workload determine

- Automated Scalling provide two types of notificcation or response in work load floctuation condition.
→ Automatic resoure Scalling IT rosoure out
→ Automatic notification of cloud consumer when work load exceed.

Diagram.

cloud Reson
administratve