

11. compare different cloud delivery model

Basis of	IAAS	PAAS	SAAS
stands for	Infrastructure as a service	Platform as a service	software software as a service
user	IAAS is used by network architects	PAAS is used by developers	SAAS is used by end user.
Access	IAAS gives access to the resources like virtual machines and virtual storage	PAAS gives access to run time environment to deployment and development tools for application	SAAS gives access to end user.
Model	It is a service model that provides virtualized computing resources over the internet	It is a cloud computing model that delivers the tools that are used for the development of application	It is a service model in cloud computing that hosts software to make it available to clients.
technical understand _{-ing}	It requires technical knowledge	some knowledge is required for the basic setup	There is no requirement about technicalities as company handles every thing.

popularity	It is popular among developers and researchers	It is popular who focus on the development of apps.	It is popular among consumers and companies
percentage rise	It has around 12% increment	It has around 32% increment	It has about a 27% rise
usage	used by skilled developer to develop unique application	used by mid-level developer to build application	used among the users of entertainment
cloud services	amazon web services, sun, v cloud express	facebook and google search engine.	MS office web, facebook and google apps
Enterprise services	AWS virtual private cloud.	microsoft azure	IBM cloud analysis
outsourced cloud services	sales force	force.com, gigaspaces	AWS, terremark

2. Risks and challenges:

- mostly to cloud consumers that use IT resource located in public clouds - its very risky to handover any valuable information to the service providers

2. increased security vulnerabilities:

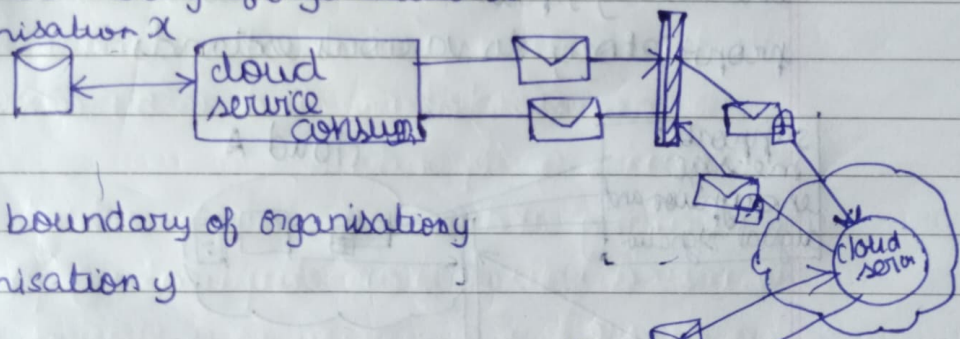
The remote usage of IT resources requires an expansion of trust boundaries by the cloud consumer to include the external cloud.

It can be difficult to establish a security architecture that spans such a trust boundary without vulnerabilities.

The overlapping of trust boundaries and the increased exposure of data can provide malicious cloud consumers with greater opportunities to ^{attack} IT resources and steal or damage business data.

It can be challenging for cloud provider to offer security mechanism.

trust boundary of organisation x

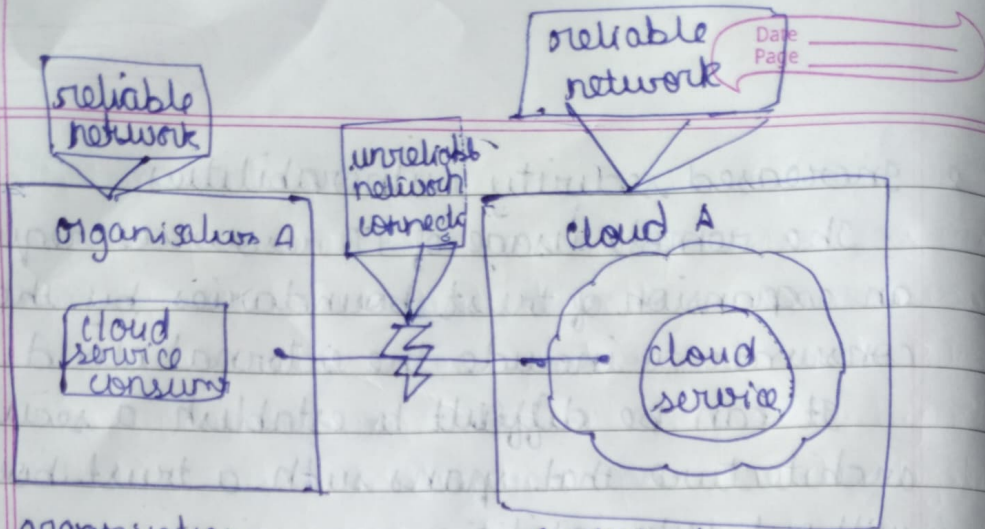


trust boundary of organisation y

3. reduced operational governance control:

cloud consumers are usually allotted a level of governance control that is lower than that over on-premise IT resources.

legal contracts, when combined with SLA's, technology inspections and monitoring, can mitigate governance risks and issues.



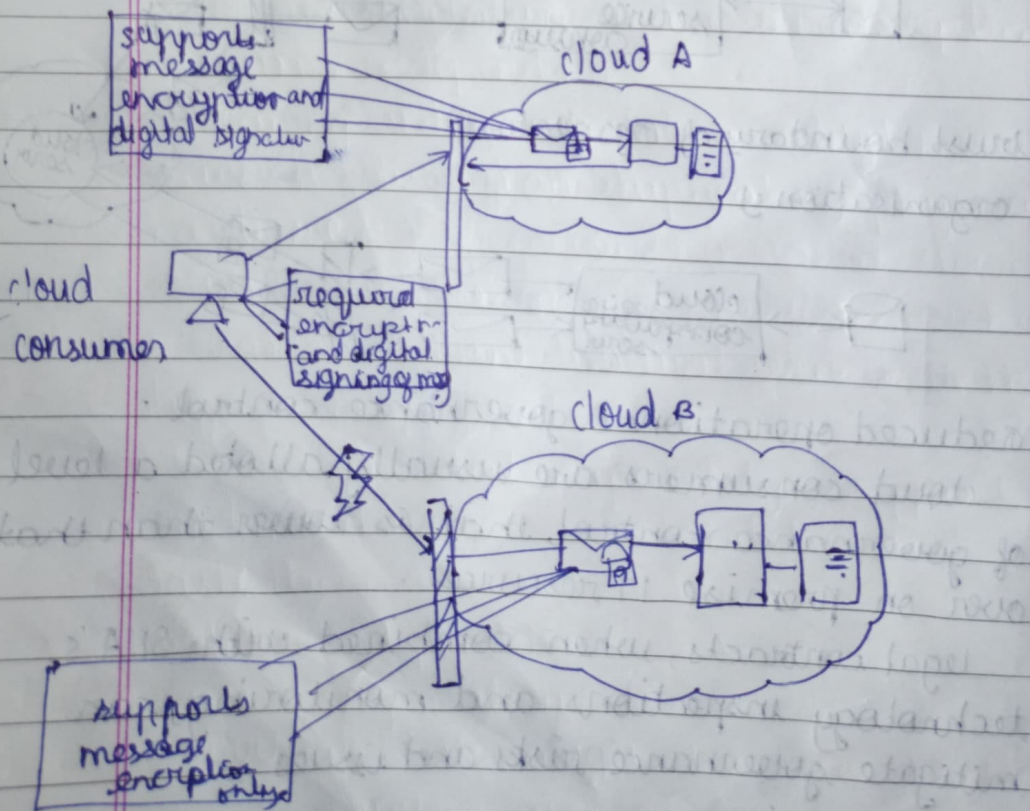
organisation

boundary of cloud
consume

organization of

boundary of cloud
provider.

4. limited portability between cloud providers.
 It becomes challenging to switch from one cloud service provider to another due to a lack of established industry standards within the cloud computing industry, public clouds are commonly proprietary to various extends.



5. Multi-regional regulatory and legal issue

Third party cloud providers will frequently establish data centres in affordable or convenient geographical locations.

cloud consumers will often not be aware of the physical location of their IT resources and data when hosted by public

2. Virtualization technologies

* Virtualization is the process of converting a physical IT resource into virtual IT resource.

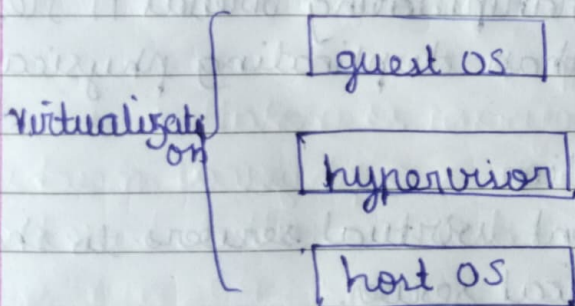
* Types of IT resource can be virtualized, including

1. servers

2. storage

3. network

4. power



server virtualization:

server virtualization is the process of dividing a physical server into multiple unique and isolated virtual servers by means of software application.

Three kinds of server virtualization

- * full virtualization
- * OS-level virtualization
- * para-virtualization

full virtualization

full virtualization uses a hypervisor, a type of software that directly communicates with physical server's disk space and CPU.

Para virtualization

Unlike full virtualization, para virtualization involves the entire network working together as a cohesive unit.

OS-level virtualization

Unlike full and para virtualization OS-level virtualization does not use hypervisor. Instead virtualization capability, which is the part of physical server, performs all the task of hypervisor.

Virtualization provides hardware independence, server consolidation and resource replication.

cleaning and manipulating virtual IT resource is much easier than duplicating physical hardware.

server consolidation

enables different virtual servers to share ~~differs~~ one physical server.

fundamental capability supports on demand usage, scalability and elasticity.

Hardware independence

resource replication

virtual disk images are accessible to host's operating system such as copy, move and paste.

OS based virtualization

OS based virtualization is the installation of virtualization software in a pre-existing operating system which is called host operating system.

The host OS consumes CPU, memory and other hardware resources.

virtual machine management

OS

h/w

H/W based virtualization

It represents the installation of virtualization software directly on the physical host hardware.

Allowing virtual servers to interact with hardware w/o requiring intermediary action from the host OS.

Virtualization management

Modern virtualization software provide several advanced management functions that can automate administration tasks and reduce the overall operation.

Other consideration:

- * performance overhead
- * special hardware compatibility
- * portability

8. virtualization:

Multiple virtual copies of server environments can be hosted by single physical server. Each copy can be provided to different users, can be configured independently.

Multitenancy:

A physical or virtual server hosting an application is designed to allow usage by multiple different users. Each user feels as though they have exclusive usage of application.

10. Characteristic of CC

on demand usage

multitenancy

elasticity

measured usage

resiliency

9. bare metal hypervisor.

When a hypervisor is installed directly on the hardware of a physical machine, between the h/w and OS is called bare metal hypervisor.

2 marks:

1. capacitive planning

It is the process of determining and fulfilling the future demands of an organisation, IT resources, product and services.

types:

lead strategy

lag

match

2. horizontal

less expensive

IT resources instantly available

resource replication and automated scaling

not limited by h/w

capacity

vertical

more expensive

IT resources normally instantly available.

additional support is normally needed.

limited by max h/w

capacity

3. common reasons

* The cloud consumer wants to extend on-premise environment into cloud for scalability economic purpose.

* The cloud consumer uses ready made environment to entirely substitute an on-premise environment.

4. private cloud

when a client wants to secure its own data but still need to gain cloud infrastructure

public cloud

cloud available in pay as you go manner to general public

owned by single organization

expensive

Eg: AWS, Google, dell

owned by third party cloud providers

Inexpensive

Eg: Email system

5. Pros of CC

reduced investment and proportional cost

increased scalability

increased availability and reliability

cons of CC

reduce operational governance control

limited portability between cloud providers

6. characteristics of multitenant tech

* usage isolation

* data security

* recovery

* application upgrade

* scalability

* metered usage

7. demands and issues

The host OS consumes CPU, memory, and other H/W IT resources.

licenses are usually required for host OS in addition to individual licenses for each of their guest OS.