Asset management:

Cloud asset management is a key concept of cloud management services.
Asset management and change management interact regularly
The asset management strategy includes

1) Software packaging → is a process that companies & orga.. use to get necessary software onto the devices of relavent users with ease.

2) Incident management → is a process used by DevOps to respond to an unplanned event or service interruption and restor the services to its operational state

3) Pool management → It manages the providers to serve multiple clients

4) Release management → scheduled deployment of program code changes for cloud based software appl. including upgrades, enhancements & bug fixes

5) Configuration management → process of configuring hardware and software settings

6) System management →

7) Operational readiness management →

8) Backup management → Cloud backup enables data, system & and app. on an organizations servers to be backed up & stored remotely in a data center.

2) Provisioning:

Provisioning process is a service that uses group of compliant processes called solution realization.

* provisioned products are servers built with all the software and infrastructure required to support a business appli.
* Standard solutions are defined so that standard workflows can be derived
* Server hardware is assembled, cabled and connected to the network and SAN before work orders are released
* provisioning or configuration means preparing a cloud to allow it to provide cloud services
* provisioning is a key feature of cloudcomputing model relating to allocation of cloud provider resources and services to a customer.
* Three models → Advanced provisioning
  Dynamic provisioning
  User self-provisioning

Advanced provisioning: Customer signs formal contract with the cloud provider. Cloud provider prepares and distributes agreed-upon resources in advance of start of service
Flat fee or monthly bill

Dynamic provisioning: Customer can purchase cloud resources based on average consumption needs.
Pay-per-use billing

User self-provisioning: Customer selects cloud resources & services via a web interface.
Customer pays for services with a credit card

3. Cloud chargeback models:

In CC, chargeback models help users to bill the cost to internal consumer of cloud services.
It means not all expenditure falls under one department

1) Standard subscription-based model:
a payment structure that allows a customer or org. to purchase or subscribe a service for a specific period of time for a set price.
This model charges the customer a recurring fee typically monthly or yearly to access a product or service

2) Pay-per use model:
is payment structure in which a customer has access to potentially unlimited resources but only pays for what they actually use.

3) Hybrid model:

4) premium pricing model: ~~is the~~
Combination of subscription based and pay-per-use pricing
Every cloud provider has its own pricing scheme.

5) Allocation based model:
Charges based on how much memory, storage or services allocated to the user

6) Flat fee:
is a payment structure that charges a single fixed fee for a service, regardless of usage.

7) Usage based pricing:
a consumption-based pricing model in which customers are only charged when they use a product or service

8) Activity based pricing:
that charges based on activities which are considered any event, unit of work or task with a specific goal

9) product or service based

(10) Market based :

when the price of a product or service is set based on its competitive market position and product market fit

Cloud virtualization Technology :

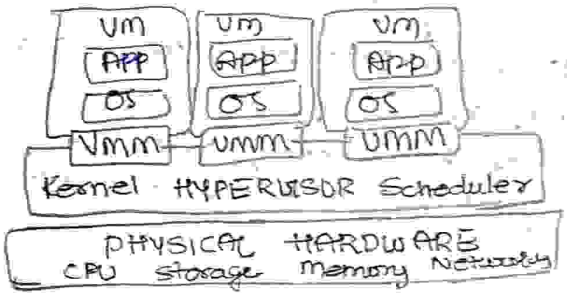
Virtualization is the creation of a physical version of something such as a server, a desktop, a storage device an OS or network resources.

Virtualization is a technique which allows to share a single physical instances of a resource or an application among multiple customer or organization.

It assigns logical name to a physical storage and provides a pointer to that physical resource when demanded.

Benefits :

* Save money
* Increased control
* Simplify disaster recovery
* business readiness assessment



VMM → Virtual memory manager

* Gathering info. across IT setup for increased utilization and collaboration
* Deliver on SLA response time during spikes in production
* The main objective of virtualization is to reduce complexity in building & managing IT infrastructure
- Different machines can run different operating systems and multiple applications on the same physical computer.

Each virtual machine is encapsulated and segregated and contains a complete system including CPU, memory and network devices to prevent conflict and allow single physical machine to safely run several different OS and applications on the same hardware.

A virtual machine provides an environment that is logically separated from the underlying hardware.

The machine on which the virtual machine is going to create is known as host machine and that virtual machine is refered as guest machine

5) Storage virtualization:

Storage virtualization in cloud computing is nothing but the sharing of physical storage into multiple storage devices which further appears to be a single storage device

* It can be also called as a group of an available storage devices which simply manages from a central console
* This virtualization provides numerous benefits such as easy backup, achieving and recovery of the data.
* This whole process requires very less time and work in an efficient manner.

Resons why storage virtualization should be implemented?

* If this virtualization implement in IT environment it will improve the management of the storage. As each and everything will properly store and managed there won't be any congestion and task will perform quickly.
* There will be very less downtime as the storage availabilit is better. All these problems eliminate with the help of an automated management system.
* Storage virtualization will provide better storage utilization as storing most information in particular place can cause loss of data, congestion and any other problems. So properly diving storage and storing data can be useful.

Types:

1) Hardware assisted virtualization:
   This type of virtualization requires hardware support It is similar to full para virtualization.
2) Kernel level virtualization
   It runs a separate version of the linux kernel. Kernel level allows running multiple servers in a single host.
3) Hypervisor virtualization:
   A hypervisor is a layer b/w the OS and hardware With the help of hypervisor multiple OS can work
4) Para-Virtualization
   It is based on hypervisor which handles emulation and trapping of software.
   The guest OS is modified before installing it to any further machine. The modified system directly communicates with hypervisor and improves the performance.

5) Full virtualization:

This virtualization is like para virtualization and in this virtualization, the hypervisor traps the machine task which are utilized by the operating system to play out activities

~~Types of virtualization:~~

~~This whole~~

This virtualization provides numerous benifits such as easy backup, achieving and recovery of the data This whole process requires very less time & works in an efficient manner.

Storage virtualization in Cloud computing does not show the actual complexity of the storage Area Network (SAN). This virtualization is applicable to all levels of SAN.

6. Types of virtualization technology:

Two major types of virtualization technologies widely used are

1) Hardware virtualization.
   → virtualizes the server hardware
2) OS virtualization
   → virtualizes the application environment

1) Hardware virtualization:

is also known as hypervisor based virtualization bare-metal hypervisor, TYPE-1 virtualization or simply hypervisors.

It has a virtualization layer running immediately on the hardware which divides the server machine into several virtual machines or partitions with guest operating systems running in each of the machines.

This approach provides binary transparency because the virtualization environment products themselves provide transparency to the OS, applications and middleware that operate above it.

Ex: IBM LPAR's
Open Source Xen
Sun LDoms
HP IVM
Citrix Xen Server

⇒ OS virtualization:

OS level virtualization or Type-2 creates virtual environment within a single instance of an OS
These system virtual env created within an OS are called containers.
OS virtualization includes a modified form than a normal operating system so that different users can operate its end use different applications.

2. Hypervisor:

A hypervisor is a form of virtualization software used in Cloud computing to divide and allocate the resources on various pieces of hardware.

* The program which provides partitioning, isolation or abstraction is called virtualization hypervisor.
* The hypervisor is a hardware virtualization technique that allows multiple guest operating systems to run on a single host system at the same time.
* A hypervisor is sometimes also called a virtual machine manager (VMM)

Types of hypervisor:

1) Type-1 hypervisor:

* The hypervisor runs directly on the underlying host system. It is also known as "native hypervisor"
* It does not require any base server operating system.
* It has direct access to hardware resources.

Ex: Citrix XenServer
VMware ESXi
Microsoft Hyper-V hypervisor

2) Type-2 hypervisor:

* A host OS runs on the underlying host system It is also known as hosted hypervisor.
* They doesn't directly run on the underlying hardware rather they run as an application in a host system

Ex: VMware player
Parallels desktop

Define SOA

SOA is an approach to architecture that is intended to promote flexibility through encapsulation and loose coupling.

SOA is define by what a service is

Service-Oriented Architecture (SOA) defines a way to make software components reusable using the interfaces.

SOA is an architectural approach in which applications make use of services available in the net.

Services are defined by the following characteristics:

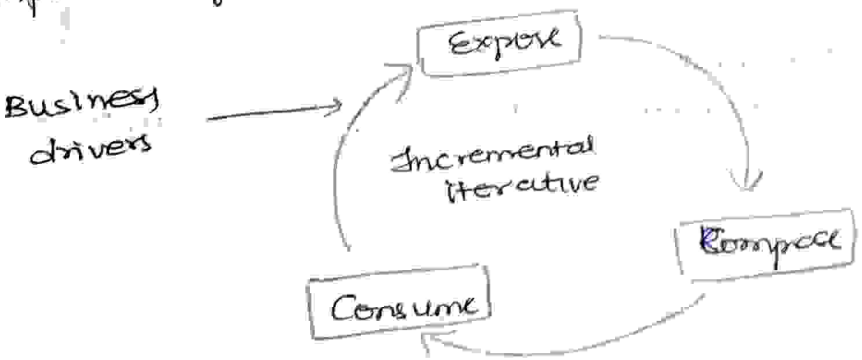
* Explicit implementation-independent interfaces
* Loosely bound
* Invoked through communication protocol
* Stress location transparency and interoperability
* Encapsulation reusable business functions

SOA life cycle:

Service orientation ties together autonomous source of information bridging a wide range of operating systems, technology and communication process.

This service orientation process is an iterative and incremental process.

It consists of creating (exposing) new services, aggregating (composing) these services into longer composing app and making o/p available for consumption by the business user



Phases:

1) Expose:

This phase focuses on creation / extraction of services from existing application and data.

Service creation can be time grained or source grained.

3) Compose:

Once services are created they can be combined into more complex services, applications or business processes. AS receives are loosely coupled they can be combined and reused with maximum flexibility.

5) Consume:

This phase is concerned with the usage of the already created services by other IT systems or end users.
It delivers new, dynamic applications that enable insight into business performance.

10. Cloud performance monitoring commands:

Cloud performance monitoring tools look at availability of services, latency and throughput, application performance and more.

1) vmstat command:

Virtual memory statistics is a built-in monitoring utility in Linux.

This command is used to obtain information about memory, system processes, paging, bloc I/o disk and CPU scheduling.

Syntax:

vmstat [options] [delay [count]]

options → various switches to customize the o/p
delay → defines the time elapsed b/w o/p updates
Count → the no-of o/p updates after the specified delay interval

2) iostat command:

Command used for monitoring system input/output device ~~loading~~ and partitions. Statistics for

Syntax:

iostat

3) mpstat command:

provides account processors information

Syntax:

mpstat [][][]

4) netstat command:

Reports network configuration & activity

Syntax:

netstat [][]

5) ipcs command:
provides infor. about active interprocess communication facilities
Syntax:
ipcs [][]

6) ps command:
ps → reports process status
Syntax:
ps [options]

options → -e → displays all processes
-f → displays a full listing
-c → displays scheduler data

7) xload command:
displays the system load average
syntax:
beload [][]....

8) tload command:
Graphical representation of system load average
Syntax:
tload [][][]....

options:→ s → the scale option allows a vertical scale to be specified for the display
d → The delay option sets the delay b/w graph updates in seconds.

9) uname command:
Displays the OS name as well as the system nodename
Syntax:
uname [-amnrsp]

10) sar command:
Used to monitor linux system's resources like CPU usage, memory utilization, I/O devices consumption.
Syntax:
sar - [options]