**what is virtucalization? How does it work?**

-virtualization is a technology that help us to install different operating system an a hardware

-They are completely seporrated and independent on each other - Virtualization hides a physical characteristic of

-Computing resources from their users, their application and end users.

-This include making a single physical resource appear to function as multiple virtual resources.

-It can also include making multiple physcial resources appear as a Single virtual resources.

**2] Explain Types of virtualization in brief? Virtualization types:-**

**- server virtualization-**

It is virtualizing your server infrastruct where you do not have to use Servers for different purpose any more physical

**-client and Desktop virtualization.**

This is similar to server virtualization. but this time is on the users where you virtualize their desktops with thin clients and by utilizing the data center resources.

-**services and applications of virtualization.**

The virtualization technology isolates. application from the underlying operating. system and from other applications in order to increase capability and manageability

**Q.what is difference between virtualization and cloud computing?**

**Virtualization**=virtualization is practically. Software that manipulates hardware

It is the followi foundation clement of cloud Computing

It service type is laas

**Cloud computing=**  It is Service that is made possible by virtualization. -cloud computing aften. relies on Vitualization to deliver it service.- It service type is laas

**Q.Explain hypervisor with its type**

-A hypervisor is a thin software layer that intercepts operating system calls to the hardwerre

-It is also called the virtual Machine manitor (VMM)

**Hypervisors are two types. -**

**1.Native of Borre Metal hypervisor**

- Native hypervisor are software system that run directly on the host's hardware control to hardware and to monitor to quest operating Systems

All of them have VMM.

Examples of this virtual machine Management architecture are oracle vm, microsoft Hyper-V, ESX and xen

**Hasted hypervisor**

Hasted hypervisor are designed to run within a traditional operating system

-A well known example of hosted hypervisor is oracle VM Virtual Box other include UMW are Server and workstation, Microsoft virtual pc, KVM QEMU and parallels

**what are the advantages and disadvantages of Virtualization**

**Advantages of virtualization.**

using virtualization for Efficient @using virtualization to increase availability

Disaster Recovery

Save Energy

Deplaying server too fast

Testing and setting. up lab Enviroment

**Disadvantages of virtualization**

Extra costs.

Software Licensing.

Learn the new Infrastructure

**Explain Containerization and it use cases in brief**

Containerization is a technalogy that allow you to package and run application and their dependencies in isolated environment called. containsas

Containcas are lightweight, portable and con run consistency across enviroments from different computing. a developer local machine to production servers.

**use cases.**

**①Isolation** -containers provide process and file system isolation, meaning that each container runs others. independently and does not interface it

**Portability-**containers package the appl code raumtime, libraries and dependencies together. making it easy to move the cappi? blw different environments.

**Efificency** - Containers Share the host operating. System kernal, which allows them to be more resource efficient compared to traditional virtual machine.

**consistency** - By wing containers, developers. can ensure that applications run consistently cuross diffrent stages of developement testing. and production.

**Q .state the difference between containerization and Virtualization**

**Containerization** =

os level process isolation.

Boots in Seconds.

Les's resource usage

**virtualization**

Hardware level process isolation

Boots in minutes

Les's resource usage

**What are the advantages of containers**

portability

Scalability.

Isolation

Securits

Efficiency

Speed

**what is docker. and how does it worke**

→Docker is one of the most popular platforms for containerization.

It provide tools to create, manage and deplay. containers efficiently.

1.Docker Engine This is the Core component of Docker. In a auntime that runs and Manages containers on a host system.

2.Docker Images containers Images are used to create

3.Docker Containers. - A container is. of a Docker image insternce

4.Docker Hub - It hosts public and private espor repositories of image and facilitates. casy distribution and access.

**Explain components on docker**

1.Docker Engine

This is the core components of Docker It is a runtime that runs and images containers. an a host system

2.Docker Images.

Docker images are read-only template that contein the application code. libraries dependencies and runtime needed to run Container

3.Docker containers.

A container is an image instance of Docker

4.. Docker Hub

Docker Hub is cloud based registry service where you con find, share and store docker. image.

5.Docker compose-

Docker compose is a tool that allows you to define and run multi-container docker

**what are the states of dockers Explain →**

**created** the container has been created but not yet started.

**Running-** the conteiner is actively executing

**Exited** -the conteiner has finished executing but has not been. ved rermove d

**Dead-** the container has falled to start or has stopped unexpectedly

**Removing** - the container is the process. being deleted

**what is zoning & How it implemented. System?**

A zone is a lightweight virtualization method that provides isolated environments within. single operating system instance d zones allow multiple independent user spaces. Called containers or zones , to run on the Same physical server, sharing the same as Kernal.

zones are used to separate application for security resource management and efficiency

each zone operates like with it own CA distinct system, processes, files network, setting. and users despite sharing the underlying System kernal with other zones.

**Explain benefits and challenges of zoïng ?**

**Security** -zones provide by isolating applications or other secure environment services from each. Even if one zone is compromised. others remain unaffected:

**Resource Efficiency.**

The Since all Zone share the sume kernal use resource more efficiency thun VMS they

**Ease of management**

Zones allow administrators to multiple isolated enviroments with a single operating system instance simplifying update patches and overall system management.

**why is zoning used in virtual management? memory**

zoning is virtual memory management is used. to efficiently manage and allocate mernory by divided the address space into differen't regions of zones.

zoning is virtual memory management is used to reduce fragmentation and protect process. address spaces.

Redwing fragmentation zoning divides RAM into fixed Size ranges. or zones that are der dedicated to specific allocation types protecting process adress spaces.

Each address process has it own virtual address space, which is protected from other processes

**what are some use cases for zones**

**1.Developement and testing.**

zones after used to create isolated develop ment and testing environments.

**2. Application Hosting.**

service provides can use zones to host multiple

**Difference between zones and virtual machines. (vms)**

**Kernal sharing.**

-zones- All zones share the same kernal with the global zone leading to less overhead and more efficient resource wage OVMS fach os cuith Um runs it own insternce of as separate kernul which requires more resource and results in more overhead

**\* Resource Allocation**

**zones.** more efficient in resource allocation. as they DS don't need to replicate the entire

VM'S - VMs virtualize the entire hardware Steuk, including cpu memory storage and network interfaess leading to higher resource usaye