Chapter-15

49. What is Virtualization

Ans:

Virtualization means to create a virtual version of device or resource.

50. Write the importance of Cloud resource Virtualization

Ans:

The importance of cloud resource Virtualization are

a. System Security
b. Performance & reliability
c. Development & management services.
d. Performance isolation.

51. Write the types of Virtualization Simulate.

Ans:

There are four types of Virtualization Simulate

a. Multiplexing
b. Aggregation
c. Emulation
d. Multiplexing & Emulation.

* Multiplexing => Multiple virtual object ; [illegible] physical object [illegible]

- Aggregation ⇒ একটা virtual object ; multiple physical object থেকে তৈরী করা হয়,
- Emulation ⇒ একটা virtual object, different type physical object থেকে তৈরী করা হয়,
- Multiplexing & Emulation ⇒ Paging use করা হয়।

Q2. Define Layering

Ans:

A common approach to manage system Complexity

Q3. Write the advantages of layering

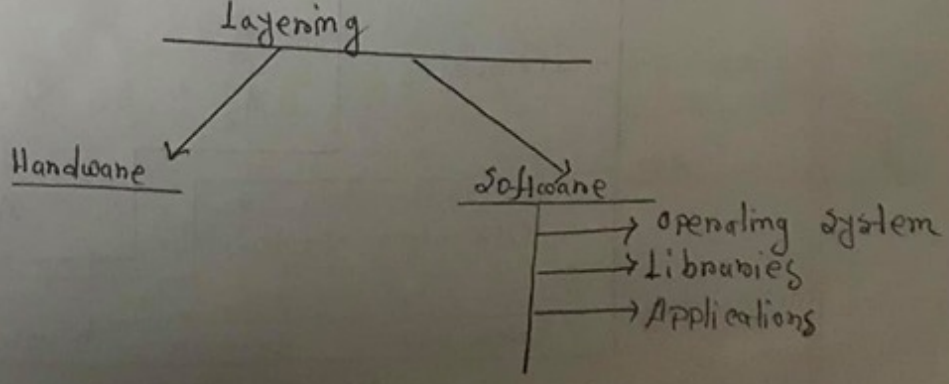
Ans:

~~a. Mini~~

a. Minimizes the interactions between the sub-systems.

b. Simplifies the description of the sub-system.

c. Able to design, implement, modify the individual subsystems independently.



Hardware দুই ধরনের mode এ run করে।
a. Privileged / Kernel mode
b. User mode

54. Describe different types of interfaces.

Ans: There are three types of interfaces.

a. Instruction Set Architecture (ISA): It works at the boundary between hardware & software.

b. Application Binary Interface (ABI): Does not include Privileged system instructions. It invokes system calls.

c. Application Programming Interface (API): It defines a set of instructions for hardware. Gives the application access to the ISA. It includes high level language library

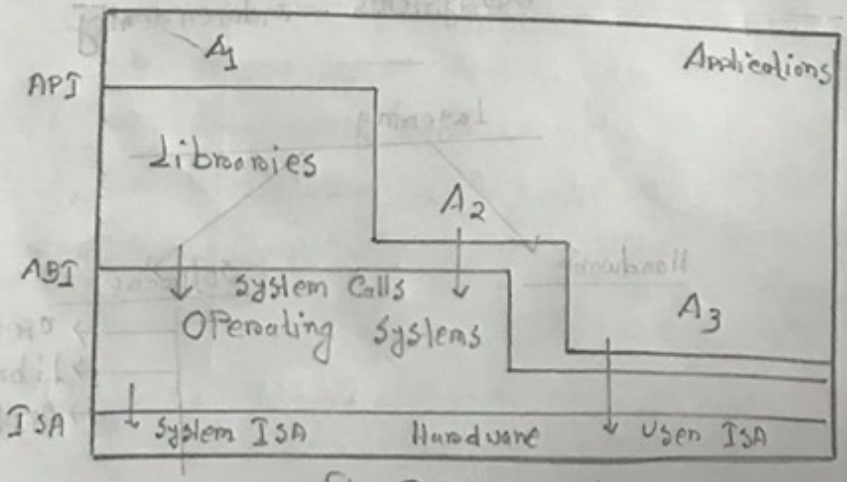


Fig: Interface layers

55. Draw HLL ; VM environment diagram

Ans:

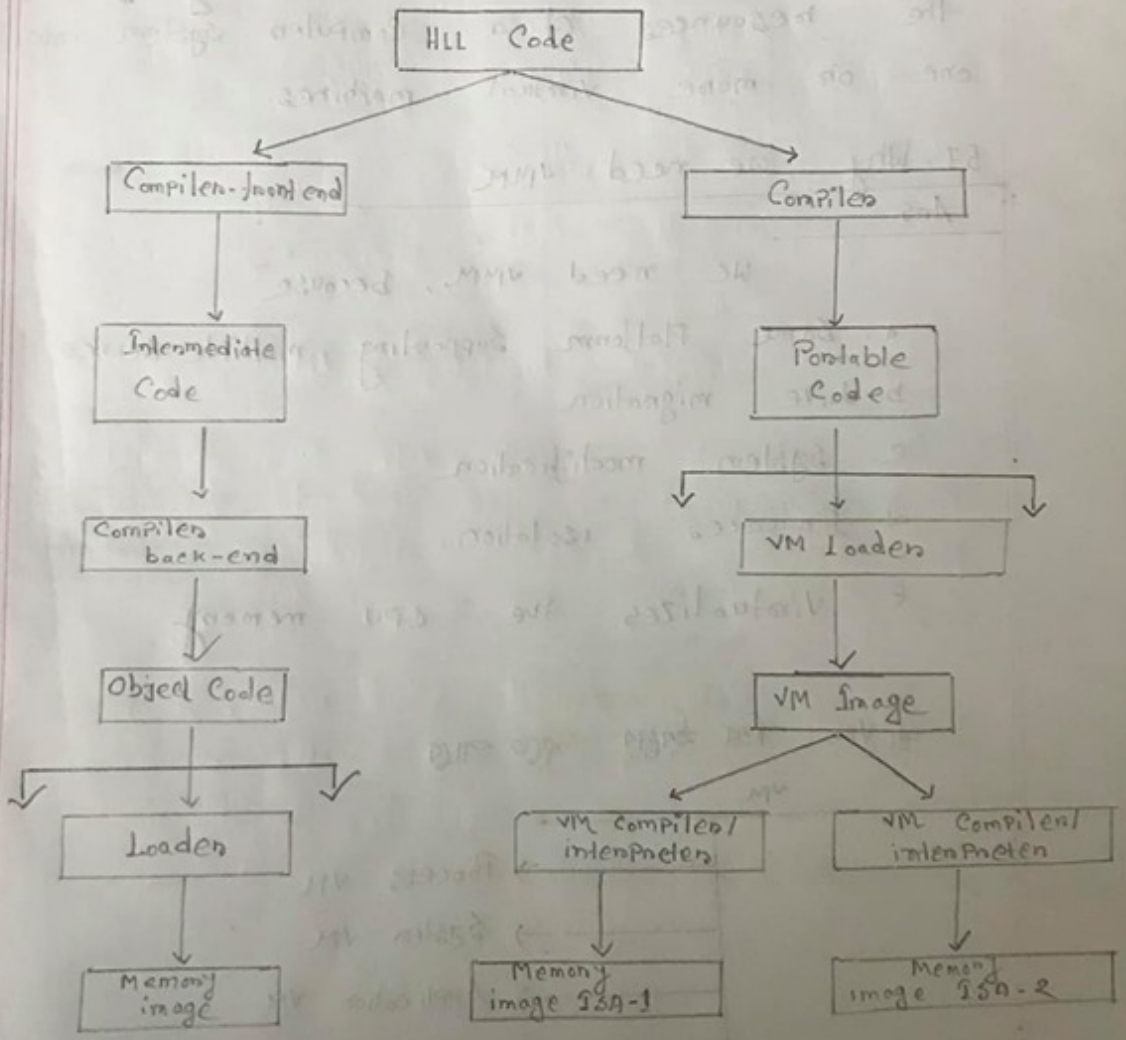


Figure: HLL ; VM environment diagram

56. What is Virtual Machine Monitor (VMM) / hypervisor

Ans:

It's a software that securely partitions the resources of a computer system into one or more virtual machines.

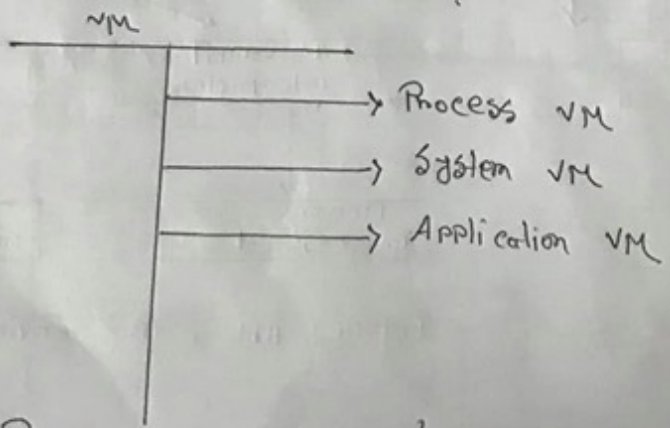
57. Why we need VMM

Ans:

We need VMM; because

a. Same Platform supporting multiple service
b. Live migration
c. System modification
d. Enforces isolation.
e. Virtualizes the CPU memory

VM কি কি প্রকার হতে পারে



Process VM => একটা individual Process চালানোর জন্য কাজে লাগে।

// System VM → Mutliple Process এর জন্য কাজ করে,
// Process VM → Application VM দুটোই একই রকম,

58. Draw Process VM & System VM diagram

Ans.

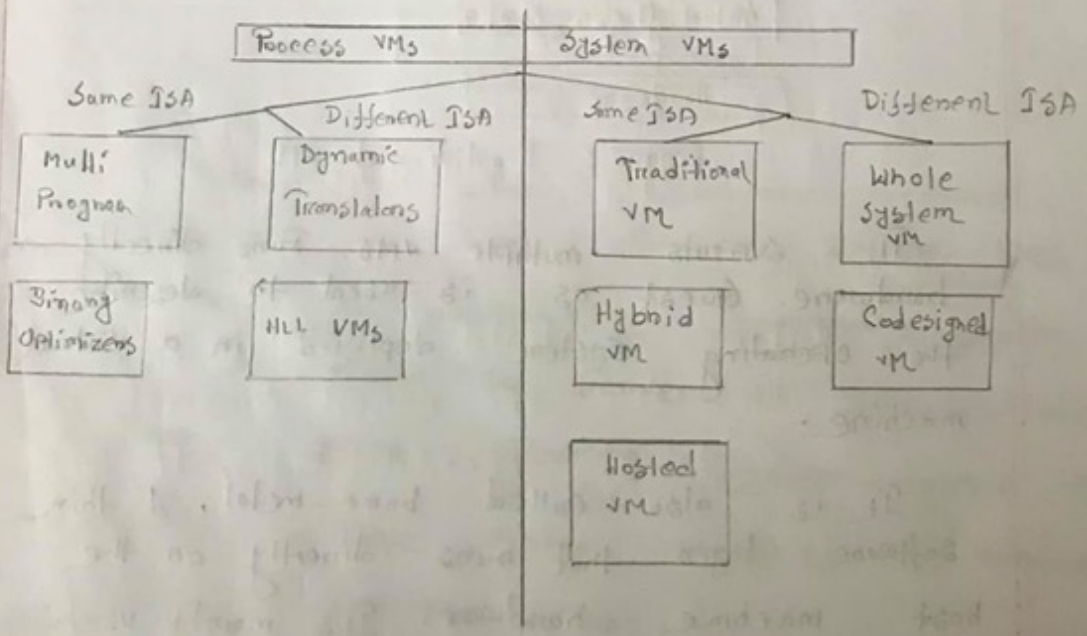


Figure: Process VM & System VM diagram

59. Describe Traditional VM

Ans:

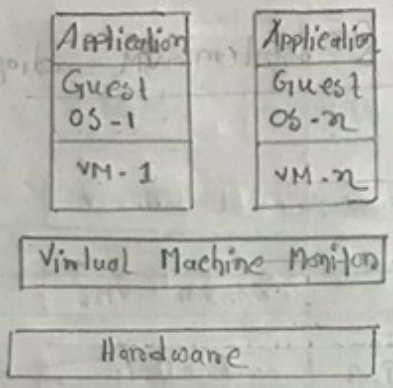


Figure: Traditional VM

It supports multiple VMs. Runs directly on hardware. Guest os is used to describe the operating system deployed in a virtual machine.

It is also called bare-metal. A thin software layer that runs directly on the host machine hardware. It's mainly useful for it's performance criteria.

60. Describe Hybrid VM

Ans

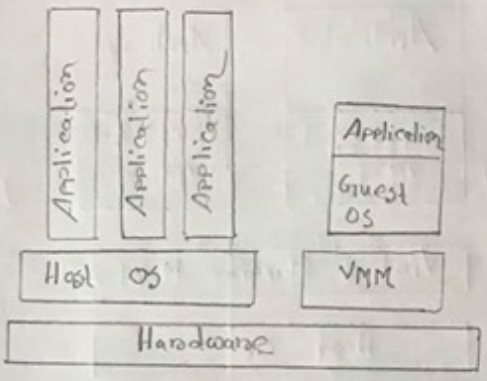


Figure: Hybrid VM

Hybrid VM shares hardware resource. It uses a host operating system. Host OS is used to describe an operating system used in virtualized server to differentiate it from guest operating system. Hybrid VM supports multiple virtual machines. It reduces reduces resource cost.

61. Describe hosted VM's advantages & disadvantages.

Ans:

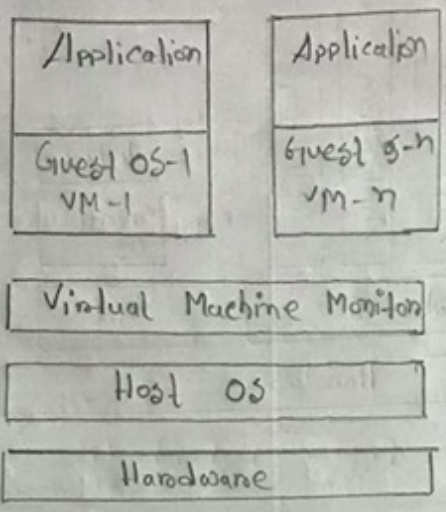


Figure: Hosted VM

Advantages:

a. Easier to build & install
b. VMM can use several components of host OS. Example: Scheduler, Pager, I/O drivers.

Disadvantages:

a. Too much overhead
b. Low Performance.
c. Page faults.
d. Scheduling request passed to the host OS.

62. Write key Points on Performance & Security Isolation

Ans:

a. Run time behavior of an application is affected by other applications running Con-Currently.

b. VMM is much simpler & better specified system than a traditional operating system.

c. Security vulnerability of VMMs is considerably reduced as the systems expose smaller number of Privileged functions.

63. Write differences between Guest OS Vs Host OS

Ans:

Host OS	Guest OS
a. Software installed in a Computer.	a. Software installed in a virtual machine.
b. Host OS interacts on the hardware.	b. Guest OS runs on a virtual machine.
c. Single host operating system.	c. Single or multiple guest operating system.

64. Write the differences between Para Virtualization vs Full-Virtualization

Ans:

Para-Virtualization	Full-Virtualization
a. Guest o/s & drivers must be modified to run.	a. Runs un-modified
b. Guest co-operates with host/VMM	b. Export full X86 & Platform to unmodified guest.

- Para-Virtualization
  - Advantage:
    Scales Efficiently
  - Disadvantage:
    Performance varies by workload
- Full-Virtualization
  - Advantage:
    Offloads time Consuming tasks.
  - Dis-advantage:
    Legacy hardware might not be supported

65: Draw Xen diagram

Ans:

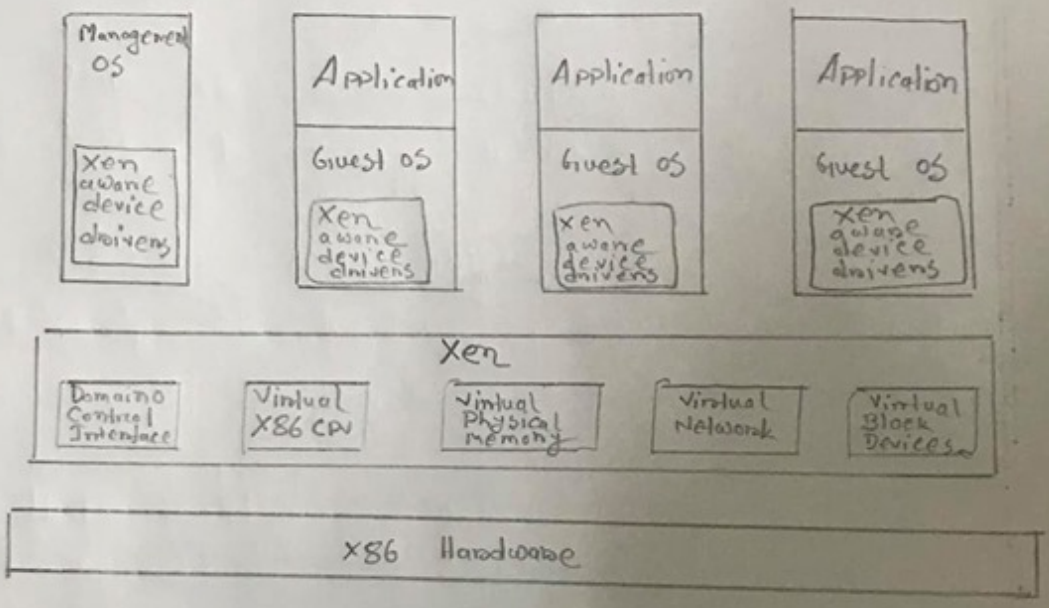


figure: Xen diagram