Cloud Computing

SEWP ZG527

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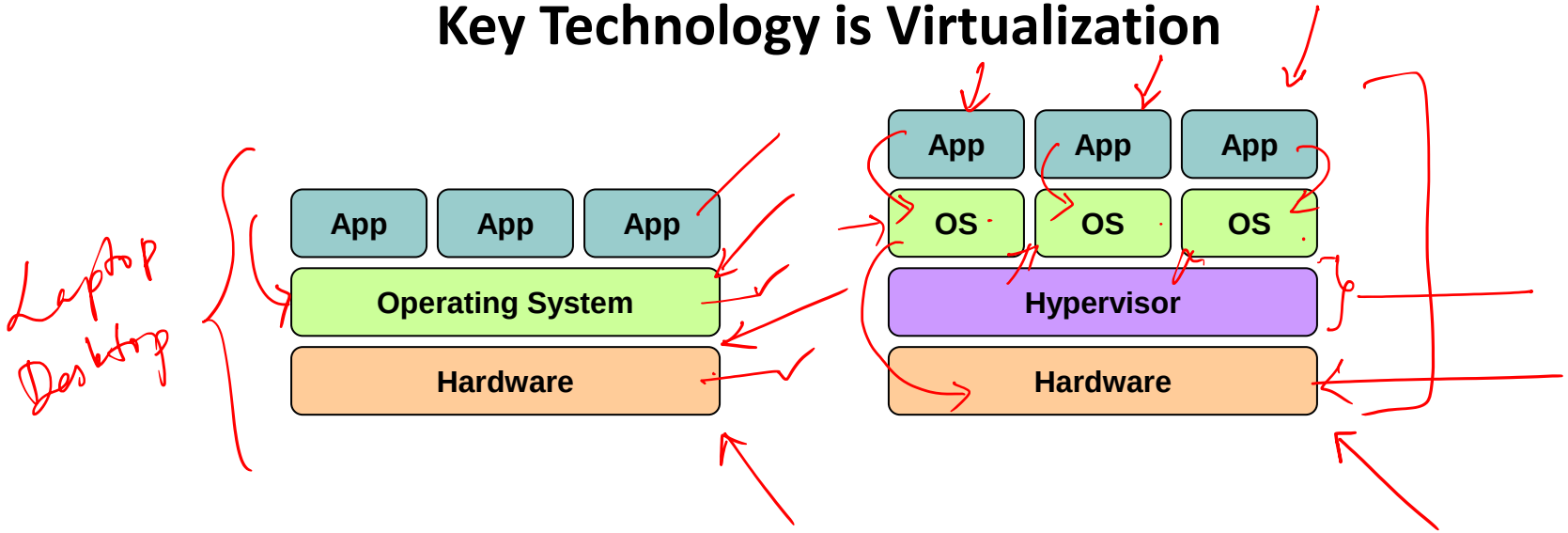
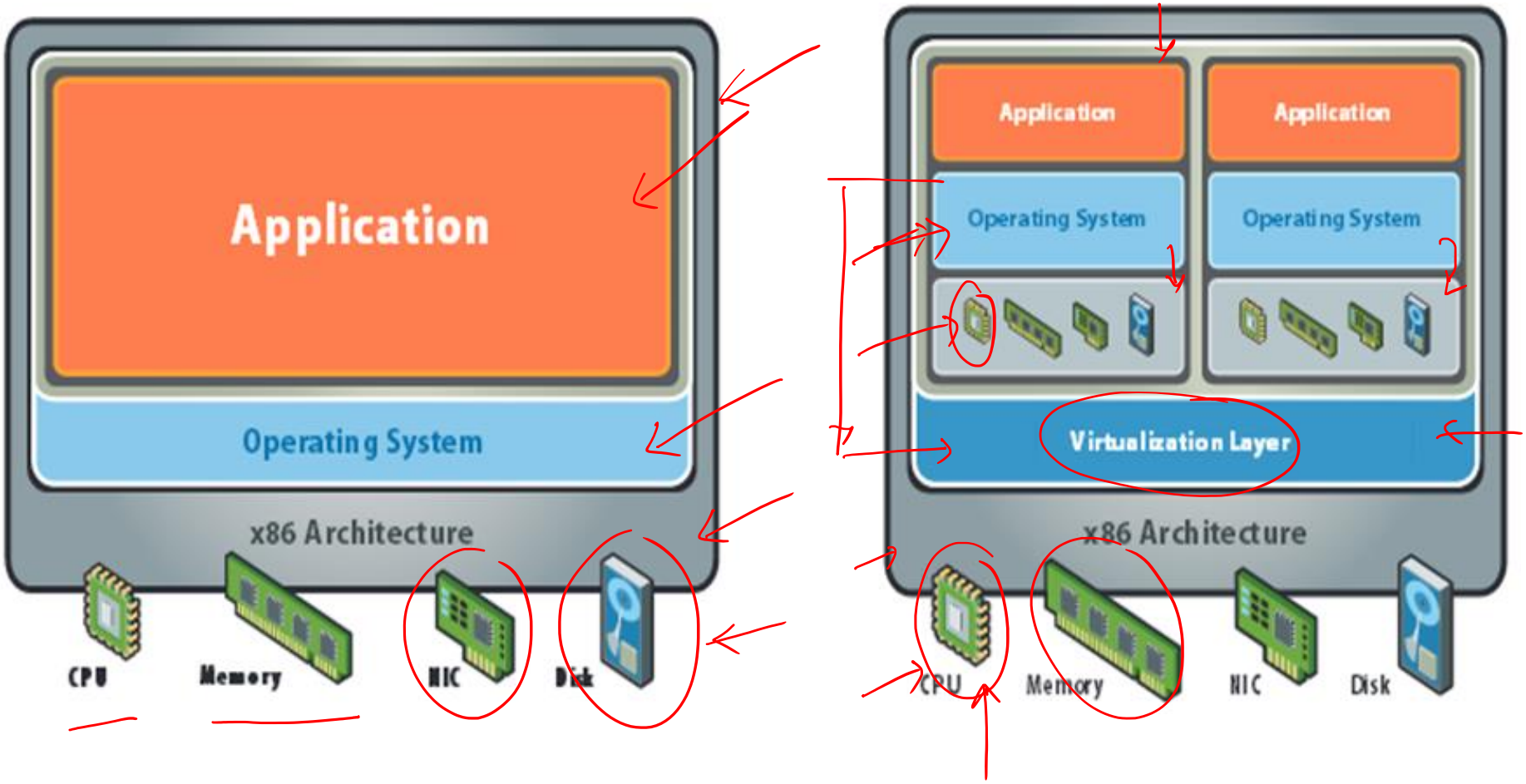
Technology made cloud possible

Key Technology is Virtualization



Virtualization plays an important role as an enabling technology for datacentre implementation by abstracting compute, network, and storage service platforms from the underlying physical hardware

What is Virtualization



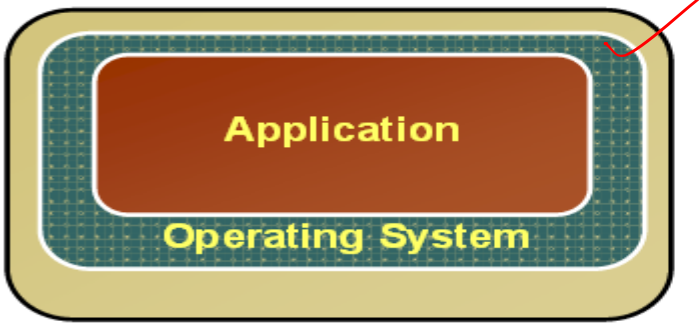
What does Virtualization do?

- Virtualization allows multiple operating system instances to run concurrently on a single computer.
- It is a means of separating hardware from a single operating system.
- Each “guest” OS is managed by a Virtual Machine Monitor (VMM), also known as a hypervisor.
- Because the virtualization system sits between the guest and the hardware, it can control the guests’ use of CPU, memory, and storage, even allowing a guest OS to migrate from one machine to another.
- Instead of purchasing and maintaining an entire computer for one application, each application can be given its own operating system, and all those operating systems can reside on a single piece of hardware.
- Virtualization allows an operator to control a guest operating system’s use of CPU, memory, storage, and other resources, so each guest receives only the resources that it needs.

Changes after Virtualization

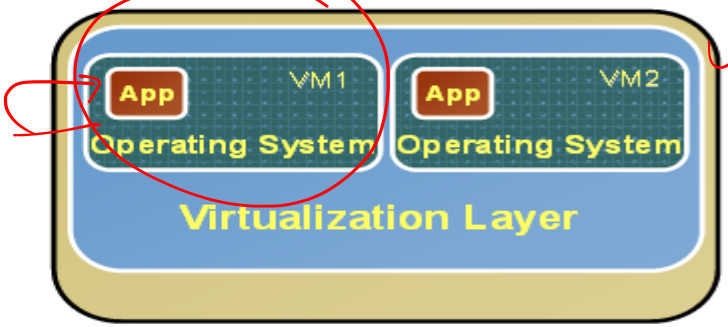
Before Virtualization

- Single OS image per machine
- Software and hardware tightly coupled
- Running multiple applications on same machine often creates conflict
- Underutilized resources
- Inflexible and costly infrastructure



After Virtualization

- Hardware-independence of operating system and applications
- Virtual machines can be provisioned to any system
- Can manage OS and application as a single unit by encapsulating them into virtual machines



Virtualization Architecture

- OS assumes complete control of the underlying hardware.
- Virtualization architecture provides this illusion through a hypervisor/VMM.
- Hypervisor/VMM is a software layer which:
  - Allows multiple Guest OS (Virtual Machines) to run simultaneously on a single physical host
  - Provides hardware abstraction to the running Guest OSs and efficiently multiplexes underlying hardware resources