Virtualization

hardware platform, operating system (OS), storage device or network resources

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Idea

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- In the case of server virtualization (**hardware virtualization**), virtualization is achieved through software that masks the hardware architecture (host) where it's performed and exhibited a new architecture, abstract, with features defined by the programming. This software is called Virtual Machine Monitor (VMM) or **hypervisor**.

The Role of the Operating System

traditional

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traditional

With Type 1 Hypervisor

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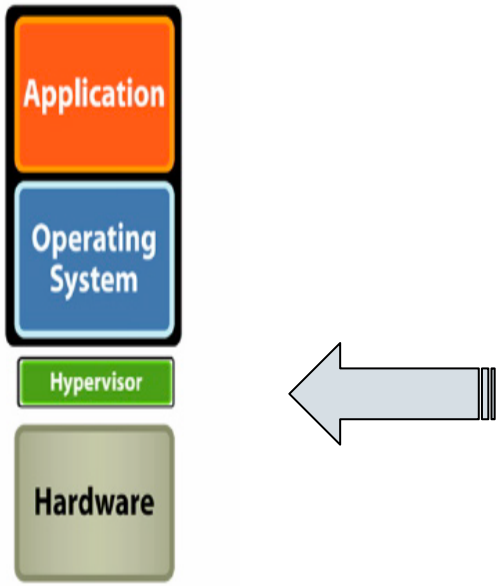
traditional



With Hypervisor

Attributes of All Virtual Machines

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- **Encapsulation**
  - Virtual machines provide a level of indirection. Any software running within them can be controlled and manipulated.

Important

Hardware independence

The virtualized machine can see virtual devices: network cards, video cards, cpu, etc, which are released from the particular hardware and software defined by the hypervisor. Moving a virtual machine from one hardware to another (implementation of new hardware or migrate machines for high reliability, or otherwise) does not pose compatibility problems.

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Separation of services

Each machine has its own virtual environment under exclusive use. It 's easy to separate the various services on multiple virtual machines (instead of multiple services on a single machine), reducing downtime for maintenance and avoiding that the problems of one service will affect the others.

Performance

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- The typical experience for a general purpose server workload on a Type 1 Hypervisor is around 1-5% of CPU overhead and 2-3% Memory overhead, with some additional overhead that varies depending on overall IO load.

- For 64 bit Server operating systems running on hardware that supports the most current cpu hardware virtualization extensions all Type 1 hypervisors are heading for that 1% overhead number.

Virtualization Server Product

- VMware vSphere
- Citrix Xen Server
- Microsoft Hyper-V.
- Red Hat KVM

Test machine

- 2 VCPU, Intel Xeon X5650 @ 2,67 GHz
- 4 GB RAM
- 30 GB HD, iSCSI
- sl6test64.virgo.infn.it
- EGO Unix account

Thanks