Virtualization

Virtualization

- Virtualization covers many different topics

Virtualization

From Wikipedia, the free encyclopedia

In computing, **virtualization** is a broad term that refers to the abstraction of computer resources:

Look up *Virtualization* in Wiktionary, the free dictionary.

- Platform virtualization, which separates an operating system from the underlying platform resources
  - Full virtualization
  - Hardware-assisted virtualization
  - Partial virtualization
  - Paravirtualization
  - Operating system-level virtualization
  - Hosted Environment (e.g. User-mode Linux)
- Resource virtualization, the virtualization of specific system resources, such as storage volumes, name spaces, and network resources
  - Virtual memory, which allows uniform, contiguous addressing of physically separate and non-contiguous memory and disk areas
  - RAID (Redundant array of independent disks) and logical volume management, combine many disks into one large logical disk.
  - Storage virtualization, the process of completely abstracting logical storage from physical storage
  - Channel bonding, the use multiple links combined to work as though they offered a single, higher-bandwidth link
  - Network virtualization, creation of a virtualized network addressing space within or across network subnets
  - Computer clusters and grid computing, the combination of multiple discrete computers into larger metacomputers
  - Disk partitioning, is the splitting of a single resource (usually large), such as disk space or network bandwidth, into a number of smaller, more easily utilized resources of the same type
  - Encapsulation, the hiding of resource complexity by the creation of a simplified interface
- Application virtualization, the hosting of individual applications on alien hardware/software
  - Portable application
  - Cross-platform virtualization
  - Emulation or simulation
  - Virtualization Development, further work in this area
- Desktop virtualization, the remote manipulation of a computer desktop

Virtualization can also refer to:

- a fictional use of this term, in Scanners (Code Lyoko)

Where Running "Windows In a Box" comes in

- Idea is to have a host OS, that allows other operating systems to run inside of itself.

- Host OS provides virtual devices:

  - RAM

  - CPU (more on that)

  - Disk Space

  - NIC

  - Peripherals

Advantages and Disadvantages of Virtualization

- Advantages

    - Don't have to reboot to get into another operating system

    - Can do testing and use many different operating systems

    - Can do testing and use different CPU architectures

    - "Sandbox"

- Disadvantages

    - 3D support lacking: cannot give native support of the GPU to the virtual machine currently (Ohh Nos, WOW doesn't work! Or Solidworks, or Counter Strike)

    - Virtualization Penalty - Wikipedia has comparison page

        - http://en.wikipedia.org/wiki/Comparison_of_virtual_machines

Current Applications for Virtual Machine use

- VMWare – Proprietary, Free as in Free Beer now?

- Qemu – Slow on it's own, good at providing peripheral support

- KVM – Fast, Emerging(+/-), incorporated into current Linux kernel

- Xen - proven

- Hyper-V – Micro$ux

Cloud Computing as a Concept

- Cloud computing abstracts hardware from users

- Multiple Resources, One task and vice versa

- VCL

- Requirements of an effective cloud:

  - Lots of networking

  - Ability to self-manage resources:

    - hot swapping os's
    - Handle removal and adding of resources

  - Users

Question and Answer(maybe?) Time