**A bit of history**

1960

In the beginning, around 1960 IBM used to deal with a lot of different systems, those systems had very little in common from a performance point of view, that means that every time an update or a new requirement where needed the whole system with a different set of instructions per each process had to be loaded again in punched cards format, then as computers where monotask machines you will have to wait until a process finishes to introduce by hand another. With all these steps and leading to bad performance, IBM researchers started to work on a system that allowed to run Batch Jobs keeping the compatibility with the previous versions.

In that time, MIT started to research on computers and as they needed new hardware capable of more than one simultaneous user they contacted to IBM and GE in order to buy it, as IBM wasn’t interested on it the hardware was bought to GE (the model GE-654 with several security levels and supporting virtual memory, developed in 1965). As IBM lost against GE they started to consider the option to add the functionality of several users at a time, especially when Bell Labs was interested in the same hardware.

In 1967 we can say the first IBM operative system with use of virtualization appeared, the CP-40 that was restricted to research. After the IBM CP-40 released in January, the model CP-67 appeared in April as the first commercial Main Frame to support virtualization.

1970

In the early 70s a model called CP- 370 was released, that model was a reimplementation of the previous model CP-67 that later will be modified by adding virtual memory system.

1999

After that years of great development in Virtualization techniques, the interest decreased until 1999 when VMware presented VMware Virtual Platform with x86-32 for Intel IA-32 architecture.

**Nowadays**

Nowadays virtualization is not a research or a theoretical topic and we can see it everywhere in computing world, from memory sharing and protection to multitasking systems and videogame emulators.

Since 2005 VMware provided for free the virtualization technology to everyone, and later the application virtualization was developed. Today VMware is still one of the most important researchers and developers of virtualization services, but that will be covered in the virtualization firms section. In every today regular computer we can find the CPU and Memory virtualized, the important part in our era we could say it is cloud, and server management, that is where application and desktop virtualization appears, as well as hypervisors.

Hypervisors are a new feature that allows to configure virtualization techniques to use at the same time different Oss. The hypervisor is an *evolution* of the supervisor that works in Kernel mode.

A very remarkable virtual machine of our time is JVM (Java Virtual Machine) which is a native abstract virtual machine which works with its own set of instructions (Java bytecode). No matter the system where the code is created or executed, when the code is compiled it is transformed to Java instructions and must be run in the JVM. That allows using programs in multiplatform instead of traducing programs to each system with its own architecture and machine code.

Another virtual machine use nowadays is the test of potential harmful programs, for instance if we want to test a program that will make a system crash we can create a virtual machine with the desired specifications and see what appends without damaging anything important. Some of this virtualized versions if they are not a command line are called Virtual Desktops.

**Virtualization firms**

We will talk now about some of the most important virtualization companies, both for the products and for the impact they had in this industry. **Hypervisor: platform that allows to modify somehow aspects of the virtualized system.**

* VMware: as one of the first virtualization providers it is still one of the most important company in this sector as it provides services to cloud computing, network, security, data storage and of course virtualization. They are remarkable in desktop and application virtualization but also provide for free a hypervisor in order to save physical resources.
* Microsoft: as one of the biggest tech companies Microsoft also works on some features of Virtualization. They have focused on Windows Server, and Azure the cloud service, where they provide Hyper-V (its hypervisor) to control all the services in the server, which is compatible with Linux.
* Citrix: Citrix was one of the very first developers of application virtualization. Nowadays owns the most used cloud vendor software: Xen is in fact used by Amazon cloud system and offers some more interesting options like XenApp and XenDesktop that can work with Intel and NVIDIA graphics.
* Oracle: we have already talked somehow about oracle when we talked about JVM, since sun microsystems was bought by oracle in 2010. Oracle has some cloud functionalities and also provides a widely used program, Virtual Box. With Virtual Box you can create your own virtual machine assigning the desired components of your computer to run that system, it is very useful when you are working on a desktop windows system and you need access to use a Linux one or in case you are a MAC user and need access to a program which only exists on windows. This is obviously an example as the possible app
* Google: with the use of great amounts of servers for Google Apps and all its services it is obvious that Google had been interested in Virtualization services. In fact, uses a special implementation of the Citrix Xen to adapt it to its own necessities by means of the product Ganeti a cluster solution, it is a wrapper around the hypervisors which makes convenient for administrators to set up a cluster.

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