

## Vmware

Technology of VMware is based on the key concept of Full Virtualization. Either in desktop environment, with the help of type-II hypervisor, or in server environment, through type-I hypervisor, VMware implements full virtualization. In both the cases, full virtualization is possible through the direct execution for non-sensitive instructions and binary translation for sensitive instructions or hardware traps, thus enabling the virtualization of architecture like x86.

VMWare virtualizes the *hardware* of the machine. The operating system running inside of a VMWare container (or Parallels or Windows' virtualization containers or Bochs or ...) have varying degrees of awareness of running within a virtualized container. Within VMWare, the operating system has no idea that it is running within a virtual container. The operating system is not modified at all, although specialized drivers are usually installed (most importantly video) to prevent performance problems. Some other VM's don't do full hardware virtualization and instead require the OS inside the container to make special calls to the container in place of the regular hardware calls.

## HyperV

Hyper-V specifically provides hardware virtualization. That means each virtual machine runs on virtual hardware. Hyper-V lets you create virtual hard drives, virtual switches, and a number of other virtual devices all of which can be added to virtual machines. Hyper-V makes it very easy to create and remove different operating systems. With Hyper-V, you can run them all on a single desktop or laptop computer. These virtual machines can be exported and then imported into any other Hyper-V system, including Azure.

## Xen Desktop

Citrix XenDesktop (now known as Citrix Virtual Desktops) is a virtual desktop infrastructure (VDI) product that allows users to remotely access and operate Microsoft Windows desktops in a data center, public or private cloud via devices located elsewhere. Users can access Windows virtual applications and desktops through the Citrix Workspace App, and virtual applications are delivered and managed via Citrix Virtual Apps.

## Qemu

Qemu(Quick Emulator, type 2 hypervisor) is a machine emulator that can run operating systems and programs for one machine on a different machine. Mostly it is not used as emulator but as virtualizer in collaboration with KVM kernel components. In that case it utilizes the virtualization technology of the hardware to virtualize guests.

## JVM

A Java Virtual Machine is an example of application virtualization. No hardware other than the processor is virtualized(unlike VMWare). Like a real computing machine, it has an instruction set and manipulates various memory areas at run time.

JVMs are developed to run and communicate with the underlying hardware & OS structure, it's necessary to select the appropriate JVM version for our OS version (Windows, Linux, Mac) and processor architecture (x86, x64) .

## References

1. <https://www.vmware.com/solutions/virtualization.html>
2. <https://www.geeksforgeeks.org/virtualization-vmware-full-virtualization/>
3. <https://learn.microsoft.com/en-us/virtualization/hyper-v-on-windows/about/>
4. <https://www.parallels.com/blogs/ras/citrix-xendesktop/>
5. <https://www.skysilk.com/blog/2021/kvm-vs-qemu/>
6. <https://ubuntu.com/server/docs/virtualization-qemu>
7. <https://www.linkedin.com/pulse/understanding-jvm-rahul-ranjan/>