

# Virtual Private Server

## VPS - what it is and how it works

Virtual Private Server (**VPS**), also known as Virtual Dedicated Server (**VDS**) is one of several types of web hosting services provided by an Internet hosting company.

The concept of a virtual private server can be better explained as a virtual machine that caters to the individual needs of a user just as a separate physical computer that is dedicated to a particular user. The virtual private server provides the same functionality and privacy as that of a regular physical computer. Several virtual private servers can be installed on a single physical server where each one can run its own operating system.

As a rule, this service includes access to a part of physical server hardware resources (configuration and performance of which depend on the plan you choose). It is a real quantum leap in the field of online resource development.

VPS/VDS hosting combines flexible dedicated server configuration, individual IP address, ports, ability for user to choose a software and means of developing. All the services are available for a reasonable price, not much higher than the price of a shared hosting.

### Main differences between Virtual and a Dedicated server

It is important to understand that the only differences between VPS and dedicated servers that are worth highlighting all stem from how the hardware is used. Both VPS and dedicated hosting can offer low-end and high-end servers, and both can be blazing fast!

Now, let's turn our attention to the differences that stem from the architectures of the two types of services.

- *Cost.* VPS options are much cheaper than their dedicated counterparts.
- *Configuration.* Configuration is one aspect where dedicated servers really stand out. Because you're the only user on the system, you have near total-control over everything and can therefore do pretty much whatever you want with it — right down to changing various parts of its core software and or hardware.
- *Security.* Dedicated servers are generally said to be more secure than VPS. This is because in addition to all the usual threats that any hosting plan must face, VPS servers have a particular weakness that dedicated don't: the hypervisor.
- *Performance.* Performance is largely related to the server's hardware specifications. Given two servers with the same specifications, dedicated servers will always have a performance advantage over VPS servers — because they don't have to share the resources between users and with a VPS server.

## What is KVM virtualization?

**Kernel-based Virtual Machine (KVM)** is a virtualization infrastructure for the Linux kernel that turns it into a hypervisor. KVM requires a processor with hardware virtualization extension.

Using KVM, one can run multiple virtual machines running unmodified Linux or Windows images (we use only Linux). Each virtual machine has private virtualized hardware: a network card, disk, graphics adapter, etc.

A typical KVM installation consists of the following components:

- A device driver for managing the virtualization hardware; this driver exposes its capabilities via a character device `/dev/kvm`.
- A user-space component for emulating PC hardware; currently, this is handled in the user space and is a lightly modified QEMU process.

- The I/O model is directly derived from QEMU's, with support for copy-on-write disk images and other QEMU features.

Here are some notable benefits of KVM virtualization:

- *Near Native Performance:* KVM uses hardware support to manage processor states and memory virtualization, resulting in near native performance which makes it a scalable solution.
- *Full Virtualization:* KVM is a full virtualization technology as opposed to para-virtualization techniques thus no modifications are needed in the guest operating systems. This means that KVM can support proprietary operating systems such as Linux, Windows without requiring any changes to them. Memory virtualization capabilities of KVM expose the full address space to its guests, thus all kinds of memory access mechanisms are supported from software.
- *Security and Failure Isolation:* KVM virtualization solution provides the means for failure isolation thus fulfilling the security needs of mobile, automotive, server and cloud computing environments.
- *Open Source and Support for New Platforms:* KVM is an open source solution providing all the benefits of open source software, while being actively maintained by a large development community.