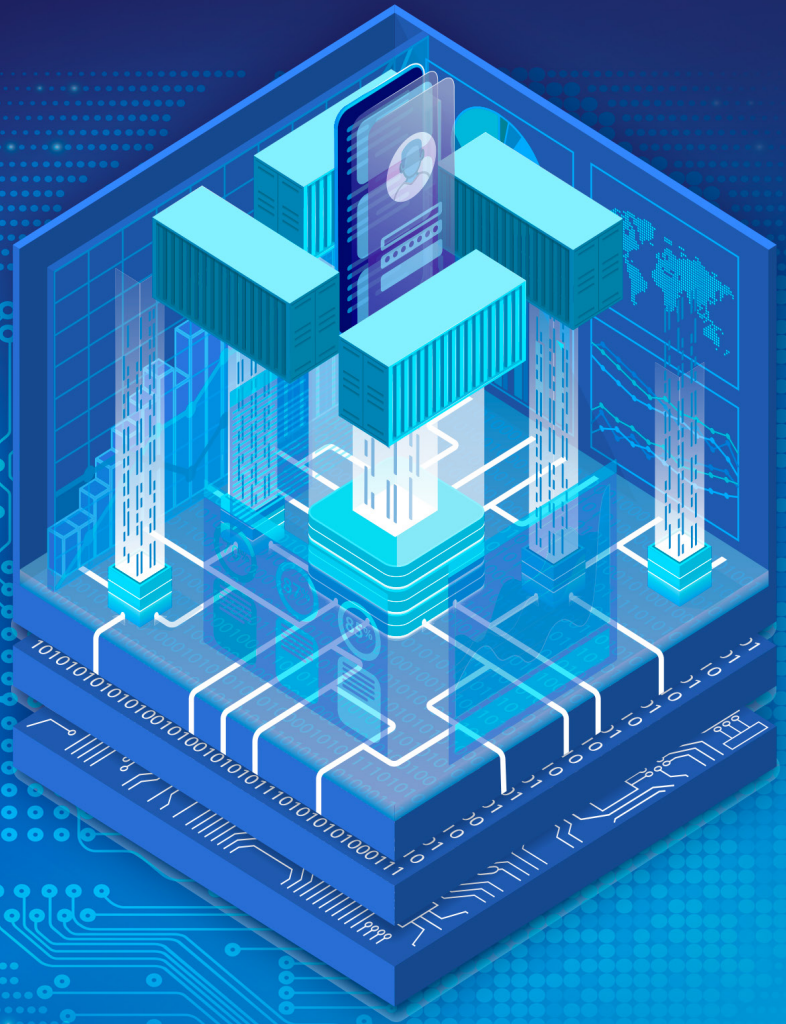# Three keys to running your entire enterprise more efficiently.

Choose virtualization, containerization and orchestration with VMware.

White Paper by

OVHcloud®

Virtualization, Containerization and Orchestration

Many organizations are looking for ways to streamline how they store, access and run their software applications and other programs. However, too many companies fail to make the required changes to improve efficiency and drive down costs. They end up using more hardware than needed and spend more money on storage.

This article will discuss standard methods that businesses can use to cut costs and run programs more efficiently. Specifically, we will talk about virtualization, containerization and orchestration.

What is virtualization?

Virtualization is a computing practice that allows you to use a machine's full capacity by enabling it to act and perform like many computers. Virtualization allows you to run a computer system in what's known as a hypervisor.

The hypervisor is used to abstract the physical resources of the machine and allocates them efficiently to each individual virtual machine (VM). With virtualization, it's possible and practical to run many different operating systems simultaneously on the same hardware. Through virtualization, many different VMs share hardware to prevent wasting resources.

VMware is one of the most commonly used sources of virtualization software and services.

Benefits of Virtualization

Virtualization is like carpooling, where multiple people share the same car. By splitting a server up into multiple VMs, multiple people can use the same server. Virtualization saves companies resources and money because they no longer have to buy multiple expensive servers that aren't being fully utilized. Virtualization, with the help of a hypervisor, dramatically improves resource use efficiency by splitting up the server's hardware resources and allocating them to new virtual servers. This provides the ability to turn one server into many different servers with different operating systems and applications. Virtualization lets you do more with less — it's cheaper, allows companies to be a lot more flexible and makes scaling much more manageable.
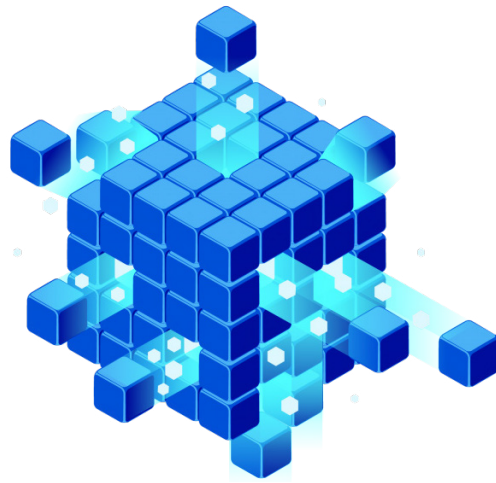
What is containerization?

Containerization is similar to virtualization in that it's a computing practice designed to increase efficiency. However, containerization is different from virtualization in several respects.

With virtualization, applications can use different operating systems. With containerization, applications run in isolated spaces called containers, which all share the same operating system. Using containers is faster because you are only virtualizing small portions of an operating system (i.e. applications). Utilizing containerization, you can deploy multiple containers on a single physical server or VM. Containerization is also compatible with virtualization, and the two can be used together.

Benefits of Containerization

With containerization, it is easier to deploy and migrate applications. Containerization optimizes application virtualization and makes it easy to manage pipelines. Additionally, containerization simplifies DevOps adoption, speeds up applications and services, and improves app security. Like virtualization, containerization also reduces costs and prevents hardware resource waste.

Docker is one of the oldest and most popular containerization tools. It's revolutionized the software industry and is still widely used today.

What is orchestration?

Orchestration is a computer process that involves automating, coordinating and managing computer software, systems, data and processes. Orchestration is often used in conjunction with containerization to enable the work of individual containers, allowing applications to be automated, managed and scheduled.

The Benefits of Orchestration

Orchestration takes a lot of the burden off of the IT team by managing many aspects of software systems. It makes it possible to automate the configuration, management and interoperability of different applications, computer systems, data and services. It simplifies the installation process and decreases dependency errors. It increases deployment speed by allowing applications to be scaled with only a single command. Additionally, orchestration enables the easy creation of new containerized applications to address increases in traffic. With containerization on dedicated servers, orchestration will allow you to optimize your efficiency.

Kubernetes and K3s can be used to automate, deploy, scale and manage containerized applications. RancherOS is another excellent tool that uses Docker for management.

How to choose between virtualization and containerization.

These technologies are so powerful that some companies use both virtualization and containerization. Some also add orchestration into the mix to increase efficiency even more.

Suppose you are running applications or other software and want to reduce the amount of hardware you need to run your programs and systems. In that case, virtualization and containerization are two great choices. With either one of these options, you can reduce the number of servers you need, reducing hardware expenses while increasing efficiency and ensuring your operations run smoother. However, companies usually choose one or the other based on their specific needs and preferences.

The first key decision point to consider when trying to choose between virtualization and containerization is operating systems. If you want to run multiple operating systems simultaneously on the same hardware, you'll want to go with virtualization. If you know that all of your applications will run on the same operating system or kernel, you may want to use containerization to streamline your systems.

Another key item you need to consider when trying to choose between virtualization and containerization is the use case. If your tasks tend to be repetitive, need different versions of the same software or require incredibly

fast deployment, then containerization is generally the better option. If you need different operating systems, plan on reselling a hosting service, or need to create a lasting infrastructure, virtualization is the way to go.

Both options will serve you well, and either one is preferable to the traditional methods of under-allocating large amounts of hardware to run, store and manage software programs and applications. Some companies even use these technologies in tandem, creating containers using an orchestration tool within VMs. Experiment with these technologies and see what the right setup is for your business.

Use Cases

Containerization: Dev/Test

For development and test (dev/test) environments, containerization is critical for optimizing your infrastructure to increase delivery speed, improve efficiency and utilization of resources, track and control costs, provide self-serve portals for developers, and ensure security throughout full development lifecycles by keeping resources under IT's control. Containerization makes it easy to deploy numerous test environments for applications, test different versions of applications, and quickly delete and spin up new tests.

Virtualization: Secure Web Server

Creating a web server isn't too complex in its own right, but once you start feeding in databases back-end applications, and start backing up the data, it can become burdensome. A great way to separate these functionalities for ease of use and security is by utilizing VMs. By creating separate VMs for the front-end website, database, back-end applications, and data backups, you can keep all critical data off the public internet. Splitting up your database, back-end applications, and backups into an intranet, you have only the front-end website connected publicly.
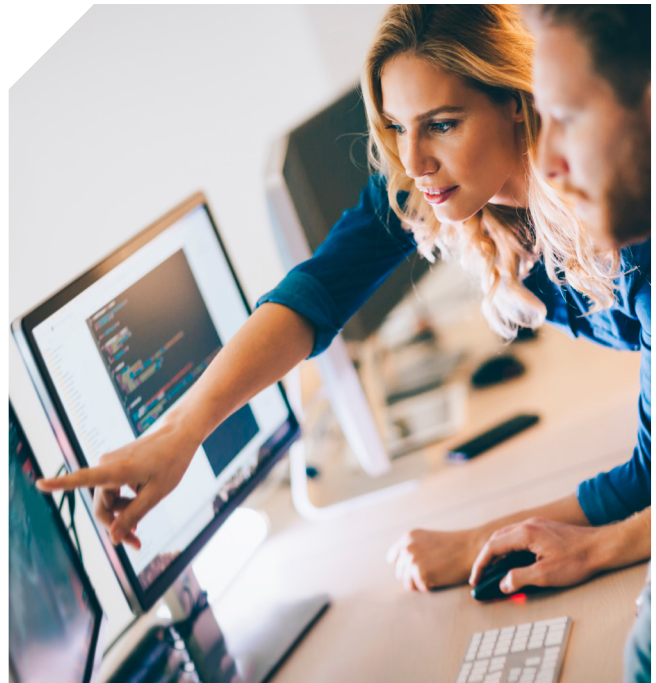
Orchestration: Automation

Orchestration connects things and processes to make the entire enterprise work more efficiently. Creating lots of similar containers can be very time-consuming, but with orchestration, you can get this done in just a few clicks. By automating the deployment, scheduling, networking, scaling, and management of the containers, orchestration allows you to simplify load balancing, resource allocation and security enforcement. This saves incredible amounts of time, especially in enterprise solutions that utilize thousands of containers.

OVHcloud US is a subsidiary of OVHcloud, a global player and Europe's leading cloud provider operating more than 400,000 servers within 37 data centers across four continents. For over 20 years, the company has relied on an integrated model that provides complete control of its value chain from the design of its servers to the construction and management of its data centers, including the orchestration of its fiber-optic network. This unique approach allows it to independently cover all the uses of its 1.6 million customers in more than 140 countries. OVHcloud now offers latest generation solutions combining performance, price predictability, and total sovereignty over their data to support their growth in complete freedom.

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